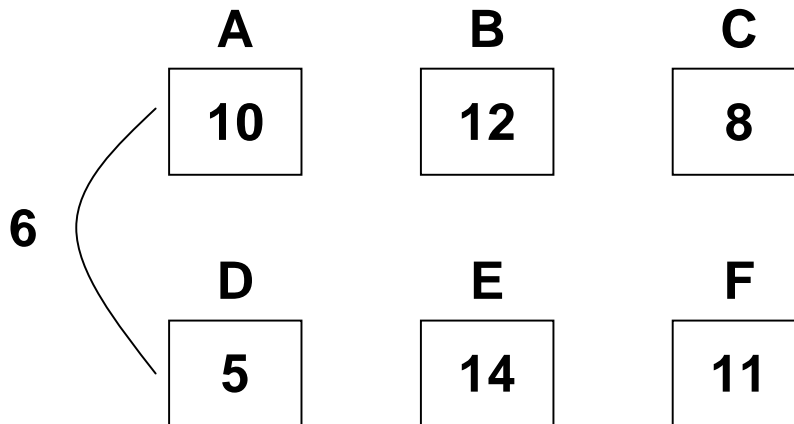INSTRUCTIONS

This is an experiment in the economics of market decision making. The National Science Foundation has provided funds for conducting this research. The instructions are somewhat more complicated than usual but if you are careful and make good decisions, you should still be able to earn a CONSIDERABLE AMOUNT OF MONEY, which will be PAID TO YOU IN CASH at the end of the experiment.

In this experiment, we will create a market in which you will act as bidders in a series of auctions. There will be six different items for sale in each - items A, B, C, D, E and F – with one unit of each item for sale in each auction. These items will be sold using a combinatorial clock auction (CCA) procedure to be described shortly.

1. **Value of the items for sale:** Each item will have a stand alone value – the value of purchasing the item by itself – along with a possible synergy value associated with purchasing two or more items.

   The following picture may help to clarify things: In each case the stand alone value of each item is in the box.

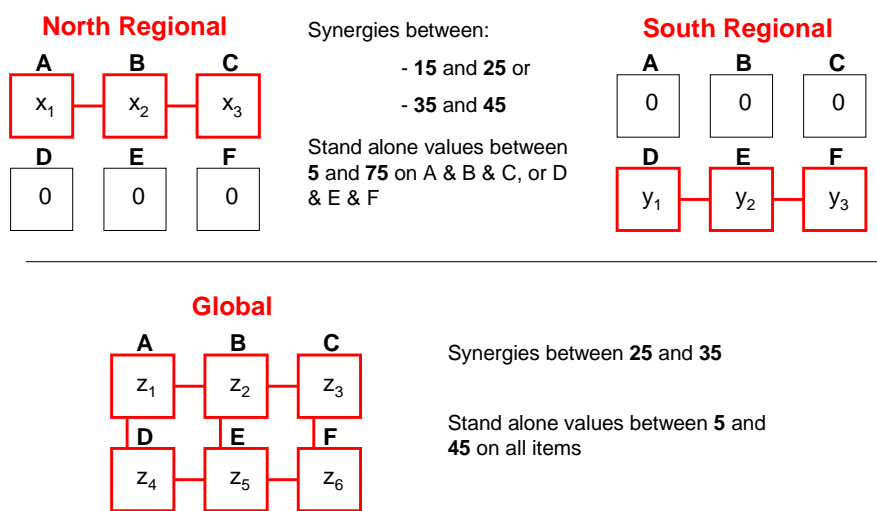   In this case the stand alone value of A is 10, B is 12, etc.

   Further, there are possible synergies associated with purchasing 2 or more items as indicated by the arcs and the numbers next to the arcs. In this case the synergy associated with purchasing **both** A **and** D is 6. So that the total value of purchasing both A and D would be 21, whereas if that same bidder purchased A by itself it would be worth 10 and D by itself would be worth 5.

   One way to think about this set-up is to imagine these 6 items as articles of clothing. For example, A could be a shirt, B a pair of pants and D another pair of pants. You value each of these items individually, but you like some more than others so they have higher stand alone values, and there could be synergies between the items that can be worn together. For example, since shirt A goes particularly well with pants D you get a synergy bonus (or extra satisfaction) from having them both, in addition to what

they are worth on their own. On the other hand, you probably don't get a synergy from having pants B and pants D since you're unlikely to wear the two together. In that case, having B and D is only worth the sum of their stand alone values.

For today's experiment and those of the next two sessions there will be 3 bidders in each market – 2 regional bidders and 1 global bidder – with the following valuations and synergy structure.

Valuations for Today's Experiment

North Regional

A	B	C
x_1	x_2	x_3

D	E	F
0	0	0

Synergies between:
- **15** and **25** or
- **35** and **45**

Stand alone values between **5** and **75** on A & B & C, or D & E & F

South Regional

A	B	C
0	0	0

D	E	F
y_1	y_2	y_3

Global

A	B	C
z_1	z_2	z_3

D	E	F
z_4	z_5	z_6

Synergies between **25** and **35**

Stand alone values between **5** and **45** on all items

Your role as a regional or global bidder will change randomly from auction to auction as will your valuations and the other bidders in your market.

The North regional bidder will be interested in items A, B and C placing positive value on these items with zero value for the others. There will be positive synergies between items AB and BC for the North regional bidder. Similarly, the South regional bidder will be interested in items D, E, and F placing positive value on these items with zero value for the others. There will be positive synergies between items DE and EF for the South regional bidder.

The global bidder has positive value for all 6 items and positive synergies between pairs AB, BC, DE, EF, AB, BE, and CF.

The stand alone values for the regional bidders will be integer values between 5 and 75, with either low synergy values (integers between 5 and 15) or high synergy values (integers between 25 and 35). Which synergy regime we will be in for the regional bidders will be announced in advance (and will always be the same for both regional bidders).

The stand alone values for the global bidder for each item will be integer values from the interval 5 and 45, with synergy values between 25 and 35 in all cases.

You will be informed of your stand alone values and your synergy values on your computer screen at the start of each auction. For the North regional bidder this will look like the following:

North Regional Bidder's values:

This period's valuation														
ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
55.0	22.0	51.0	0.0	0.0	0.0	true	true	false	false	false	false	false	0.0	32.0

The North regional bidder's stand alone values in this example are A = 55, B = 22, C = 51, with zero value for the remaining items. Further, the synergy value for purchasing A and B is 32, with the synergy value for purchasing B and C 32 as well.

The Screen for the South Regional bidder will be very similar with positive stand alone values for D, E, and F and with a synergy bonus for purchasing each of DE and EF.

Global Bidder's values:

This period's valuation														
ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
17.0	35.0	31.0	32.0	25.0	26.0	true	true	true	true	true	true	true	0.0	33.0

The global bidder's stand alone values in this example are A = 17, B = 35, C = 31, D = 32, E = 25, F = 26, with a synergy bonus for purchasing each of the relevant pairs such as AB and BC of 33 each.

Note that the synergy value for purchasing any pair of items will always be the same and will always be a constant equal to the Synergy Constant. The North regional bidder will always have a synergy value associated with purchasing AB and BC. Similarly the South regional bidder will always have a synergy bonus for purchasing DE and EF. And the global bidder will have a synergy bonus associated with each of the pairs listed.

Note that your stand alone value for items as well as your synergy values will change from auction to auction and will rarely, if ever, be the same for different bidders within a given auction.

Properties of the CCA: Items will be sold using a combinatorial clock auction (CCA) procedure. The principle underlying the CCA is that each bid represents a bid for a package of items. For example, you can bid on the package containing A, B **and** C, as well as a package containing A and B alone or a package containing A alone. The bids are what's called an XOR package bids – meaning that only one of your bids can be a winner and, if the bid is a winner, you get *all* the items in the package.

Bids of this sort are particularly valuable when there are synergies between individual items. Take the Global bidder example shown above. If the prices of items A, B and C were each 40, you would lose money if you bought any of these items alone. But you would make money if you could buy the set A, B, and C at these prices, because their total value 149 (the sum of the stand alone values – 83 – plus the sum of the two synergy bonuses 66) is greater than the total cost of 120. Package bidding allows you to express demand in this way – here is my bid on A, B and C as a set along with how much I am willing to pay for each item by itself or in different combinations.

Why should you want to make a bid on the **package** A, B **and** C as well as the pair A and B (and/or B and C) as well as each item **alone**? As we'll describe shortly, the auction rules make it possible that your bid for items and smaller sets of items in early rounds, when their prices are lower than their values, might eventually be a winning bid *at those prices* later on even price have increased substantially in later rounds. That is, by bidding on individual items smaller sets of items, especially early on, you create a *chance* that you might be able to buy the item later on at the early, low prices.

The CCA relies on a computational algorithm to determine who gets the items. Basically, the computational algorithm takes all the bids placed by all the bidders and looks for the set of bids that will *maximize* seller revenue. *In doing this the algorithm will look at all current bids as well as all past bids to find the combination of bids that maximizes seller revenue.* This is necessary because with package bidding there are typically "fitting" problems; e.g., someone might place a very high bid on a package containing items A, B, C, D and E but since she has no value (or very low value) for item F the computer will want to find someone who values F alone as this fits well with the package A, B, C, D, E **and** maximizes revenue. In doing this it may need to call on an earlier bid for F. (Note, when using a bid from a previous round the price you would have to pay will be what it was when the bid was originally placed.)

CCA procedures: The auction will proceed in rounds, with each round lasting for 30 seconds during which you can place bids. As long as there is more demand for each item than the supply of that item (i.e., there is excess demand for the item) the auction will continue and the prices for the items with excess demand will increase.

Once **two consecutive** rounds have gone by without any bidding activity the auction will end with each item sold to the high bidder at those prices.

Most of today will be spent familiarizing you with the auction procedures, including a few practice auctions.

In each auction there will be 3 bidders. There are a total of _____ you in the room so we will be conducting _____ auctions simultaneously, with 3 bidders in each auction. Who will be assigned to bid in your auction will be determined randomly for each auction so it is very unlikely you will be bidding against the same people in any two different auctions. One side effect of this is that we must wait for all the auctions to be completed before moving on to another auction. So you may be idle for a bit after your auction has finished.

In addition if there are an uneven number of subjects present relative to the number of bidders in each auction market, you may be on standby for a given auction. But you will be guaranteed to be active in the next auction period.

As in the real auctions you will each be given starting capital balances of 150 experimental currency units (ECUs). (All values in the session will be in terms of ECUs). For the real auctions to be conducted in the next two sessions any profits earned in an auction will be added to your starting capital balances. Any losses will be subtracted from it. You total earnings for a session will consist of your end of session balance, less 130 ECUs, and will be converted into US Dollars at a rate of

1 ECU = 0.xx US dollars. (The actual rate will be determined in the next session.)

You will all be paid $10 for today's session which will consist of familiarizing you with the software and conducting several practice auctions. We'll start to play for cash in the next two sessions.

Dry run instructions:

Login instructions: *Will use their OSU e-mail addresses as their ID number. Will also have to post which exp number working with.*

This is a dry run. Please don't do anything until we ask you to do so, so that we can familiarize you with the information layout.

You are signed in as Subject: s3

| Home | Sign out |

| Experiment: 0007 | | Design: Combinatorial Clock | | Valuation: Geographic | | Date Started: | |

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	1	Ready to start round	35	35	100.0	100.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F
Offer quantity:	1	1	1	1	1	1
Current round price:	5	5	5	5	5	5
Price increment:	---	---	---	---	---	---

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 0, 0, 0	0.0	0.0	0.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
0.0	0.0	0.0	42.0	37.0	22.0	false	false	false	false	false	true	true	0.0	32.0

Analytics | Previous period results

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
		⊙	○	○	○	○	○	○	○	○	○
add	☑	0, 0, 0, 1, 0, 0	42.0	5.0	37.0	0.881	none	0.0	0.0	0.0	0.0
add	☑	0, 0, 0, 0, 1, 0	37.0	5.0	32.0	0.865	none	0.0	0.0	0.0	0.0
add	☑	0, 0, 0, 1, 1, 0	111.0	10.0	101.0	0.910	none	0.0	0.0	0.0	32.0
add	☑	0, 0, 0, 0, 0, 1	22.0	5.0	17.0	0.773	none	0.0	0.0	0.0	0.0
add	☑	0, 0, 0, 1, 0, 1	64.0	10.0	54.0	0.844	none	0.0	0.0	0.0	0.0
add	☑	0, 0, 0, 0, 1, 1	91.0	10.0	81.0	0.890	none	0.0	0.0	0.0	32.0
add	☑	0, 0, 0, 1, 1, 1	165.0	15.0	150.0	0.909	none	0.0	0.0	0.0	64.0
add	☐	1, 0, 0, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	0, 1, 0, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 1, 0, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	0, 0, 1, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 0, 1, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	0, 1, 1, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 1, 1, 0, 0, 0	0.0	15.0	-15.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 0, 0, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	0.0	0.0
add	☐	0, 1, 0, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	0.0	0.0
add	☐	1, 1, 0, 1, 0, 0	42.0	15.0	27.0	0.643	none	0.0	0.0	0.0	0.0
add	☐	0, 0, 1, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	0.0	0.0

Please look at your screens now. At the upper left hand corner it shows we are in Period 1, Round 1 meaning we are in the first round of the Auction 1 (Period 1). Round duration shows how much time you have to place a bid. Right next to that – Round Time Remaining – shows how much time is left to make your bid. Next to that is your staring capital balance – 100 ECUs in this example – followed by your current balance (your starting balance plus any profits or losses from previous auctions), followed by the profit or loss from the current auction. The clock is paused right now so we can go through your screens with you.

Right below this are the items for sale – A, B, C, D, E and F along with the number of units of each item for sale (offer quantity) – which will always be 1 – followed by the

current round price and the price increment – the price increase from the last round to the current round. Prices will start at 5 and increase by 5 between all rounds.

Right below this is your currently demanded bid – the bid you have made in this round of the auction. This always starts at 0 for all units.

Below this is the information regarding your stand alone values for each item, along with which pairs will generate synergies. This example is for a South regional bidder with stand alone values for D = 42, E = 37, F = 22, and A = B = C = 0 as well a synergy bonus for the pairs DE and EF = 32. *(Note – the experimenter will be pointing to these items on the slide as he goes through the example.)*

Below this is the list of *all* possible bids you could make. The list is quite large even for this simple case of six units for sale. To help you make sense of this we have provided you with the ability to sort the outcomes by different criteria – value, current cost, current profit, etc. In addition, for the regional bidders we have put a check next to all the packages which contain items D, E and F only as these are likely to be the packages of primary interest as all the other packages contain items (such as A, B, or C) which are of no value but which you would still have to pay for in bidding on them. Any packages with a check mark will be sorted first by the criteria you choose and placed at the top. Packages without check marks will then be sorted by the same criteria and placed below the checked packages. So take your curser and click on the little circle under the first sort criteria – Value. Try this now. Does everyone see this?

The next column allows you to sort based on Current Profit. This will list all possible packages from highest to lowest based on the Current Profit for each package. Here too – the checked packages will be sorted first by this criteria followed all the other packages. Try this now to see how it works.

Next you can sort by profit divided by value.

Next you can sort by bids submitted in the last round, by past cost, by past profit, by the decrease in profit, and by synergy value. *(E points to these columns as he goes through them.)* These are a lot of sort options. We have provided them because we do not know what you might want to do or what will work best for you. Please play with these a bit to see how they work.

Note that if you are a global bidder, you will not have a check next to any packages to begin with since you have value for all items. However, after you have placed a bid on a package or packages – in whatever round – it will get a check next to it, and any subsequent sorts will sort these packages first, followed by the remaining packages. (The same will hold true for the regional bidder should they choose to bid on a package that does not start out with a check mark.)

Note that both regional and global bidders can drop the check mark on any package simply by clicking on the little box with the check. This will drop the package into the second tier of the sort. Also note that regional bidders are not obliged to only bid on packages with checks next to them to begin with. We've adopted the two tier sorting procedure because we think it might be helpful to you.

Any questions?

We'll give you a minute or two to play with these sort possibilities. Check some boxes and uncheck others and try sorting. We want to make sure you have practice with all the things that might help you in the auction.

Finally, we should note that any package that would yield negative profit at current prices will have the "current profit" entry highlighted in red. This is designed to make it easier to identify such packages. For example, in this slide you can see that at the current prices the potential profit is negative for a South regional bidding on A alone (-5), B alone (also -5), AB (-10), etc...

Finally to make your bid(s) just click on the "add" next to the package(s) you want to bid on. When you do this the cost of the bid will be automatically calculated for you based on the current prices. This next slide shows an example of this. This bidder has bid on three packages – one package with only item D, one with only item F and one with items D and E. You can see the value of each package, the cost, and the potential profit. (*E walks them through both lines.)* Note, the default package with no bids on any items will always be present.

If you want to change your bid within the current round just click on "remove" for the package you wish to eliminate. Try this now – make a bid and then remove it.

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Experiment: 0007	Design: Combinatorial Clock	Valuation: Geographic	Date Started:			

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	1	Clock Paused	35	34	100.0	100.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F
Offer quantity:	1	1	1	1	1	1
Current round price:	5	5	5	5	5	5
Price increment:	---	---	---	---	---	---

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 0, 0, 0	0.0	0.0	0.0
0, 0, 0, 1, 0, 0	42.0	5.0	37.0
0, 0, 0, 0, 0, 1	22.0	5.0	17.0
0, 0, 0, 1, 1, 0	111.0	10.0	101.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
0.0	0.0	0.0	42.0	37.0	22.0	false	false	false	false	false	true	true	0.0	32.0

Analytics | Previous period results

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
		⊙	○	○	○	○	○	○	○	○	○
remove	☑	0, 0, 0, 1, 0, 0	42.0	5.0	37.0	0.881	none	0.0	0.0	0.0	0.0
add	☑	0, 0, 0, 0, 1, 0	37.0	5.0	32.0	0.865	none	0.0	0.0	0.0	0.0
remove	☑	0, 0, 0, 1, 1, 0	111.0	10.0	101.0	0.910	none	0.0	0.0	0.0	32.0
remove	☑	0, 0, 0, 0, 0, 1	22.0	5.0	17.0	0.773	none	0.0	0.0	0.0	0.0
add	☑	0, 0, 0, 1, 0, 1	64.0	10.0	54.0	0.844	none	0.0	0.0	0.0	0.0
add	☑	0, 0, 0, 0, 1, 1	91.0	10.0	81.0	0.890	none	0.0	0.0	0.0	32.0
add	☑	0, 0, 0, 1, 1, 1	165.0	15.0	150.0	0.909	none	0.0	0.0	0.0	64.0
add	☐	1, 0, 0, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	0, 1, 0, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 1, 0, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	0, 0, 1, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 0, 1, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	0, 1, 1, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 1, 1, 0, 0, 0	0.0	15.0	-15.0	0.000	none	0.0	0.0	0.0	0.0
add	☐	1, 0, 0, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	0.0	0.0
add	☐	0, 1, 0, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	0.0	0.0
add	☐	1, 1, 0, 1, 0, 0	42.0	15.0	27.0	0.643	none	0.0	0.0	0.0	0.0
add	☐	0, 0, 1, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	0.0	0.0

If you don't click on anything before the round ends the default package will be your only bid for this round. *E points to the 0, 0, 0, 0, 0, 0 package with no value and no cost as the default package.*

OK we are going to re-start the clock now to let you bid for this round and then go on to see what happens in the next round. Please make your bids.

This next slide shows what you might see after round 1. (Again we have paused the clock so you can see this slide as well as look at your screens.)

We are in round 2. The current round prices for each item are shown just below the offer quantity in each case along with the price increment for each item. (This will always be 5 in today's experiment.) The "Last round submitted" column allows you to see what was bid on in previous periods. This subject bid on a single package in round 1 containing one unit of each item. (*E points to this*) Note, this package is highlighted in pink. The pink highlighting indicates that if the auction were to end now, this bidder would get this package at a previous round's prices—the prices at the round in which the bid was placed—and earn the profit shown under the column past profit. (*E points to this.)* Let's call such a package a "provisional winner."

| Home | Sign out |

| Experiment: 0007 | Design: Combinatorial Clock | Valuation: Geographic | Date Started: |

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	2	Ready to start round	35	35	100.0	100.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F
Offer quantity:	1	1	1	1	1	1
Current round price:	10	10	10	10	10	10
Price increment:	5	5	5	5	5	5

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 0, 0, 0	0.0	0.0	0.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
17.0	35.0	31.0	32.0	25.0	26.0	true	true	true	true	true	true	true	0.0	33.0

Analytics | Previous period results

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
add	☑	1, 1, 1, 1, 1, 1	397.0	60.0	337.0	0.849	1	30.0	367.0	30.0	231.0
add	☐	0, 1, 1, 1, 1, 1	314.0	50.0	264.0	0.841	none	0.0	0.0	-264.0	165.0
add	☐	1, 1, 1, 1, 1, 0	305.0	50.0	255.0	0.836	none	0.0	0.0	-255.0	165.0
add	☐	1, 1, 0, 1, 1, 1	300.0	50.0	250.0	0.833	none	0.0	0.0	-250.0	165.0
add	☐	1, 1, 1, 0, 1, 1	299.0	50.0	249.0	0.833	none	0.0	0.0	-249.0	165.0
add	☐	1, 1, 1, 1, 0, 1	273.0	50.0	223.0	0.817	none	0.0	0.0	-223.0	132.0
add	☐	1, 0, 1, 1, 1, 1	263.0	50.0	213.0	0.810	none	0.0	0.0	-213.0	132.0
add	☐	0, 1, 1, 0, 1, 1	249.0	40.0	209.0	0.839	none	0.0	0.0	-209.0	132.0
add	☐	1, 1, 0, 1, 1, 0	241.0	40.0	201.0	0.834	none	0.0	0.0	-201.0	132.0
add	☐	0, 1, 1, 1, 1, 0	222.0	40.0	182.0	0.820	none	0.0	0.0	-182.0	99.0
add	☐	0, 1, 0, 1, 1, 1	217.0	40.0	177.0	0.816	none	0.0	0.0	-177.0	99.0
add	☐	1, 1, 1, 1, 0, 0	214.0	40.0	174.0	0.813	none	0.0	0.0	-174.0	99.0
add	☐	0, 0, 1, 1, 1, 1	213.0	40.0	173.0	0.812	none	0.0	0.0	-173.0	99.0
add	☐	1, 1, 1, 0, 0, 1	208.0	40.0	168.0	0.808	none	0.0	0.0	-168.0	99.0
add	☐	1, 1, 1, 0, 1, 0	207.0	40.0	167.0	0.807	none	0.0	0.0	-167.0	99.0
add	☐	1, 1, 0, 0, 1, 1	202.0	40.0	162.0	0.802	none	0.0	0.0	-162.0	99.0
add	☐	1, 0, 0, 1, 1, 1	199.0	40.0	159.0	0.799	none	0.0	0.0	-159.0	99.0
add	☐	0, 1, 1, 1, 0, 1	190.0	40.0	150.0	0.789	none	0.0	0.0	-150.0	66.0

If you are holding a provisional winner there are two possibilities with respect to the prices of the items in the package highlighted in pink: (1) Prices might have increased for one or more of the items in the package. This is very likely especially in early auction rounds or (2) Prices of none of the items in your package have increased.

If prices have increased for one or more items in a package you are a provisional winner on and you bid again on this package in the current round you are accepting to buy the package at the new higher price. You do not necessarily want to do this since if there are no price increases in the next two rounds (no new bids) you would get the package at the old, lower prices. That's how this auction works – so by bidding again on the package you would be competing with yourself.

Note that *not* bidding again on a provisional winner does not foreclose getting that package even if as a result of other bidders' actions you are no longer the provisional winner in the next round as you can always come back and bid on the package in question in the round after that at higher prices.

This next screen shot shows a subject who bid on two packages in round 1: A package with items A, B and C and one with item A only. Note, that the ABC package is highlighted in yellow (not in pink). This means that if the auction were to end now, this bidder would get no items. In the case of bidding on multiple packages as we have here, and not being designated a provisional winner on any of them, the package highlighted in yellow represents your highest value bid from the previous round.

Now it definitely *does* pay for this bidder to bid in the next round if there are packages that are attractive at the new prices since if the auction were to end now they would get no items and be passing up on potentially profitable bids.

You are signed in as Subject: s2

| Home | Sign out |

Experiment: 0007 **Design: Combinatorial Clock** **Valuation: Geographic** **Date Started:**

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	2	Ready to start round	35	35	100.0	100.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F
Offer quantity:	1	1	1	1	1	1
Current round price:	10	10	10	10	10	10
Price increment:	5	5	5	5	5	5

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 0, 0, 0	0.0	0.0	0.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
55.0	22.0	51.0	0.0	0.0	0.0	true	true	false	false	false	false	false	0.0	32.0

Analytics | Previous period results

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
add	☑	1, 1, 1, 0, 0, 0	192.0	30.0	162.0	0.844	1	15.0	177.0	15.0	64.0
add	☑	1, 0, 0, 0, 0, 0	55.0	10.0	45.0	0.818	1	5.0	50.0	5.0	0.0
add	☑	0, 1, 0, 0, 0, 0	22.0	10.0	12.0	0.545	none	0.0	0.0	-12.0	0.0
add	☑	1, 1, 0, 0, 0, 0	109.0	20.0	89.0	0.817	none	0.0	0.0	-89.0	32.0
add	☑	0, 0, 1, 0, 0, 0	51.0	10.0	41.0	0.804	none	0.0	0.0	-41.0	0.0
add	☑	1, 0, 1, 0, 0, 0	106.0	20.0	86.0	0.811	none	0.0	0.0	-86.0	0.0
add	☑	0, 1, 1, 0, 0, 0	105.0	20.0	85.0	0.810	none	0.0	0.0	-85.0	32.0
add	☐	0, 0, 0, 1, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	10.0	0.0
add	☐	1, 0, 0, 1, 0, 0	55.0	20.0	35.0	0.636	none	0.0	0.0	-35.0	0.0
add	☐	0, 1, 0, 1, 0, 0	22.0	20.0	2.0	0.091	none	0.0	0.0	-2.0	0.0
add	☐	1, 1, 0, 1, 0, 0	109.0	30.0	79.0	0.725	none	0.0	0.0	-79.0	32.0
add	☐	0, 0, 1, 1, 0, 0	51.0	20.0	31.0	0.608	none	0.0	0.0	-31.0	0.0
add	☐	1, 0, 1, 1, 0, 0	106.0	30.0	76.0	0.717	none	0.0	0.0	-76.0	0.0
add	☐	0, 1, 1, 1, 0, 0	105.0	30.0	75.0	0.714	none	0.0	0.0	-75.0	32.0
add	☐	1, 1, 1, 1, 0, 0	192.0	40.0	152.0	0.792	none	0.0	0.0	-152.0	64.0
add	☐	0, 0, 0, 0, 1, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	10.0	0.0
add	☐	1, 0, 0, 0, 1, 0	55.0	20.0	35.0	0.636	none	0.0	0.0	-35.0	0.0
add	☐	0, 1, 0, 0, 1, 0	22.0	20.0	2.0	0.091	none	0.0	0.0	-2.0	0.0

It's also possible that if you did not submit a bid in the previous round that you will have no package highlighted. Your situation then is the same as a bidder with a package highlighted yellow; you are not a provisional winner and if the auction were to end you would get no items. Thus, it pays to submit a bid in this round if there are packages that are attractive at the current prices.

Special features of the CCA:

One of the special features of the CCA is that all previous bids are active at their previous prices. Since package bidding is "lumpy" (you are not bidding on individual items but rather bundles of items) the combination that maximizes the auctioneer's revenue may require calling on earlier bids. This screen shot provides an example of such a case.

Note, round 4 has just ended and we are in round 5 of the auction. A bid from round 1 is highlighted in pink, a bid for item A with a value of 55 and a **round 1 cost** of 5, for a profit of 50. (*E points to these elements as saying them.*) As is always the case when a package is highlighted in pink, if the auction were to end now, this bidder would get this package. As is always the case, the cost is based on the cost in the earlier round in which the bid was placed (in this case the round 1 price) and the potential profit from getting that package will be under the Past Profit column. (*E points to this.*) So you will need to look to Past Profit for your potential earnings whenever you have a provisional winner.

If you are a provisional winner on a package that you had bid on in an earlier round, but have not bid on that package lately, you may *not* want to bid on this package again as

more than likely the price of one or more items in the package has increased but you have a shot at getting the package at the old prices. However, you may want to bid on another package that is more profitable at current prices than the package highlighted in pink, for example the package containing A, B and C (*E points to this*), as it would yield more profit if you got it at the current prices. However, given the price increase rules – described next – its not so obvious if you would want to do this or not.

Price increases between rounds are determined as follows: Take the set of provisionally winning bids in the previous round and the set of new bids in the current round. If two or more bidders have positive demand for an item, then its price will increase. If some of the packages a bidder bids on in the current round overlap with her provisionally winning bid in the previous round, the prices of those items that are the same between the two packages will also increase. Otherwise the price will remain the same. Thus, looking at which items had price increases for the current round helps you to determine which items bidders are actively competing for. For items with zero price increases, no one wants the item or there is a single provisional winner currently demanding that item. This information may be useful in determining which package is best to bid on in this round.

The following figure illustrates how price increases are determined between rounds: The first row shows provisional winners heading into round 5. The North regional is a provisional winner for item A from round 1 and the Global bidder is a provisional winner on the remaining items from the bids in round 4. As such if the auction were to end now the North regional would get item A at round 1 price and the Global would get the remaining items at round 4 prices.

In round 5 North regional puts in a bid for the package A, B, & C, South puts in a bid for D and Global does not bid again. Prices of items increase in round 6 based on the set of provisionally winning bids in the previous round plus the set of new bids in the current round. If two or more bidders have positive demand for an item, then its price will increase. Thus, the price increases in round 6 will determined as follows:

Price Increases between Rds. 5 & 6

	North Regional	South Regional	Global
Provisionally Winning	A From Rd. 1		B C D E F From Rd. 4
Current Packages Demanded in Round 5	A B C	D	
Sum	A A B C	D	B C D E F

There are 2 units of A demanded so the price of A **increases.**

There are 2 units of B demanded so the price of B **increases.**

There are 2 units of C demanded so the price of C **increases.**

There are 2 units of D demanded so the price is D **increases.**

There is only 1 unit of E demanded so the price is **unchanged.**

There is only 1 unit of F demanded so the price is **unchanged.**

Notice that the price of item A has increased here as a result of the North regional bidder bidding on the package ABC in round 5. North Regional's bid on item A may still remain a provisional winner at the end of round 5 if she does not get the ABC package, in which case if the auction were to end she would still pay the round 1 price for A. And even if her bid for ABC becomes a provisional winner at the end of round 5, her round 1 bid on A may still be called on as a winning bid when the auction ends in which case she would pay the round 1 price for A.

The rule for determining price increases tends to result in steady price increases for individual items. As a consequence, the opportunity to make profitable bids on individual items or packages with low synergies, which may become provisional winners later in the auction, will only be preset early in the auction.

The auction ends after two rounds of no new bids or what amounts to the same thing, no price increases for 2 consecutive rounds. We use two rounds to give everyone a chance to reconsider their options; i.e., to determine if they are satisfied, given current prices, on their provisional allocations.

You will no doubt see what appear to be some strange things going on in these package auctions. The principle underlying the CCA auction is that the computer is putting packages together so as to maximize the seller's revenue. The situation is very similar to loading a moving van: The packages people are bidding on are analogous to the boxes you have packed your possessions in. These boxes come in a number of different sizes and there is limited space on the truck, so there is a fitting problem. As a result, even though there are boxes containing valuable items (packages with positive profits for you), they may not get onto the truck as there is no space for that package given the *more* valuable packages already on the truck. That is, your bid might not become a provisional winner even if you are willing to pay the current prices for some package of items, simply because your package does not fit well with the other provisionally winning bids. Sometimes, you may even be dislodged as a provisional winner even though there have been no price increases for the items you were bidding on because someone else has bid on an overlapping package that fits better with others' bids to maximize seller revenue.

Finally, sometimes you may get to be a provisional winner on an individual item or a small package that you had bid on earlier in the auction (at those early prices) as they may just help provide the best "fit" for maximizing seller revenue. Thus, in terms of the moving-van metaphor, bidding on more combinations of packages, especially early on, is similar to preparing a number of different size boxes with the hope that at least one of them will have a chance to fit onto the van. At the same time, since it's not up to you to decide which boxes get on the van, but rather the auctioneer who is trying to maximize seller revenue, if you bid on multiple packages (make up multiple boxes) one of your less profitable boxes may displace a more profitable one.

In short, determining provisional winners in this auction is a complicated process. But the key advantage to package bidding is that with positive synergies between items you are interested in you can bid on these packages without fear of losses – paying more than the items stand alone value in order to capture the synergy bonus – because with package bidding you either get all the items in your package or none of them.

What exactly should you do? If we knew the answer to that we would not have to run the experiment.

OK – I'm going to start the clock and you will continue to bid in rounds until the auction is completed. If you have any questions – raise your hand and one of us will be around to answer your question. Today's auctions are all dry runs to get you used to the software and auction rules. So feel free to explore different options.

Remember – since there is more than one group bidding, your auction may end while the other is still going on and you will not be allowed to move on until all the auctions have been completed. We'll cover the information feedback on your final screens once everyone has finished. So just hang on if your finish early.

Let every group finish before moving on.

OK – all of the groups have finished. So long as your group is not the last to finish your screen will look like the following when your auction is complete.

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Experiment: 0008   Design: Combinatorial Clock   Valuation: Geographic   Date Started:

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	7	Ready to start round	35	35	100.0	205.0	105.0

Current auctioneer offer

Your group is finished, please wait for the other groups to finish

Currently demanded bids

Your group is finished, please wait for the other groups to finish

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
0.0	0.0	0.0	42.0	37.0	22.0	false	false	false	false	false	true	true	0.0	32.0

Analytics | Previous period results

add		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
add	☑	0, 0, 0, 1, 1, 1	165.0	75.0	90.0	0.545	4	60.0	105.0	15.0	64.0
add	☑	0, 0, 0, 1, 0, 0	42.0	25.0	17.0	0.405	none	0.0	0.0	-17.0	0.0
add	☑	0, 0, 0, 0, 1, 0	37.0	25.0	12.0	0.324	none	0.0	0.0	-12.0	0.0
add	☑	0, 0, 0, 1, 1, 0	111.0	50.0	61.0	0.550	none	0.0	0.0	-61.0	32.0
add	☑	0, 0, 0, 0, 0, 1	22.0	25.0	-3.0	-0.136	none	0.0	0.0	3.0	0.0
add	☑	0, 0, 0, 1, 0, 1	64.0	50.0	14.0	0.219	none	0.0	0.0	-14.0	0.0
add	☑	0, 0, 0, 0, 1, 1	91.0	50.0	41.0	0.451	none	0.0	0.0	-41.0	32.0
add	☐	1, 0, 0, 0, 0, 0	0.0	25.0	-25.0	0.000	none	0.0	0.0	25.0	0.0
add	☐	0, 1, 0, 0, 0, 0	0.0	25.0	-25.0	0.000	none	0.0	0.0	25.0	0.0
add	☐	1, 1, 0, 0, 0, 0	0.0	50.0	-50.0	0.000	none	0.0	0.0	50.0	0.0
add	☐	0, 0, 1, 0, 0, 0	0.0	25.0	-25.0	0.000	none	0.0	0.0	25.0	0.0
add	☐	1, 0, 1, 0, 0, 0	0.0	50.0	-50.0	0.000	none	0.0	0.0	50.0	0.0
add	☐	0, 1, 1, 0, 0, 0	0.0	50.0	-50.0	0.000	none	0.0	0.0	50.0	0.0
add	☐	1, 1, 1, 0, 0, 0	0.0	75.0	-75.0	0.000	none	0.0	0.0	75.0	0.0
add	☐	1, 0, 0, 1, 0, 0	42.0	50.0	-8.0	-0.190	none	0.0	0.0	8.0	0.0
add	☐	0, 1, 0, 1, 0, 0	42.0	50.0	-8.0	-0.190	none	0.0	0.0	8.0	0.0
add	☐	1, 1, 0, 1, 0, 0	42.0	75.0	-33.0	-0.786	none	0.0	0.0	33.0	0.0
add	☐	0, 0, 1, 1, 0, 0	42.0	50.0	-8.0	-0.190	none	0.0	0.0	8.0	0.0
add	☐	1, 0, 1, 1, 0, 0	42.0	75.0	-33.0	-0.786	none	0.0	0.0	33.0	0.0
add	☐	0, 1, 1, 1, 0, 0	42.0	75.0	-33.0	-0.786	none	0.0	0.0	33.0	0.0
add	☐	1, 1, 1, ...	42.0	100.0	-58.0	-1.381		0.0	0.0	58.0	0.0

This screen lists all possible bids together with the package of items you earned highlighted in red (if you did not earn any items nothing will be highlighted). For each package the screen shows its value along with the cost and profit at the end of auction prices; this bidder earned items D, E and F at a final cost of 60. By listing all possible bids, you can look to see if might have missed out on a more profitable package. For instance, this bidder can see her potential profit on the package with item D only (*E points to this*), the package with D and E, etc… (*E points to this*). This might be helpful in determining what to do in future auctions. However, keep in mind that there is no guarantee that if you had bid differently you would have won an alternate package at these same prices, but it does give you some idea what might have been more a more favorable/profitable outcome. Note, you can use your various sort options with this screen.

If you are in the last group that finished your screen will look like this: This screen shows the winning bids for all bidders in your auction, along with the value of the package each bidder earned, its cost and that bidder's profits. Your outcome is highlighted in red. (*E points to this.*) Your profit or loss from this auction is automatically displayed in the upper right hand corner of your screens and your cash balance is updated as well. (*E points to these as reads script.*)   In this example all three got packages and earned positive profits. (E g*oes through the first two lines below pointing out that 1st guy got item A with a value of 55, cost of 20 and profit of 35; the 2nd guy got items D, E and F with a value of 165, cost of 75 and profit of 90; the 3rd guy got B and C with a value of 99, cost of 60 and profit of 39.*)

You are signed in as Subject: s1

| Home | Sign out |

Experiment: 0007	Design: Combinatorial Clock	Valuation: Geographic	Date Started:		

Period	Round		Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	8		Period ended	35	34	100.0	139.0	39.0

Current auctioneer offer

Item:	A	B	C	D	E	F
Offer quantity:	1	1	1	1	1	1
Current round price:	25	35	35	30	30	30
Price increment:	0	0	0	0	0	0

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 0, 0, 0	0.0	0.0	0.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
17.0	35.0	31.0	32.0	25.0	26.0	true	true	true	true	true	true	true	0.0	33.0

Analytics	**Previous period results**

Previous period winning bids (yours in red)

	Round submitted	Package	Value	Cost	Profit
	6	1, 0, 0, 0, 0, 0	55.0	20.0	35.0
	6	0, 0, 0, 1, 1, 1	165.0	75.0	90.0
	6	0, 1, 1, 0, 0, 0	99.0	60.0	39.0

If you finished early, once the last group finishes you can see this same information for you group by clicking on the space Previous period results (*E points to this*). If you are the last group to finish, you can see a screen like the one before this one – by clicking on the space Analytics (*E points to this and shows screen before this*). So you'll get to see the same information as those who finished early.

We'll give you a little while to look at these screens at the end of the auction. You can flip back and forth between them by clicking on Analytics and Previous period results.

OK we are going top have a second dry run. Remember your values are likely to have changed and the subjects assigned to bid in your auction have been determined randomly once again. As before there will be 3 bidders in your auction.
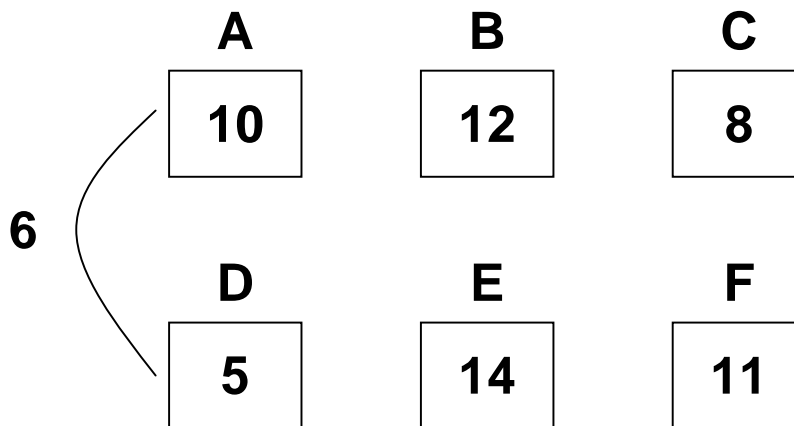
INSTRUCTIONS

This is an experiment in the economics of market decision making. The National Science Foundation has provided funds for conducting this research. The instructions are somewhat more complicated than usual but if you are careful and make good decisions, you should still be able to earn a CONSIDERABLE AMOUNT OF MONEY, which will be PAID TO YOU IN CASH at the end of the experiment.

In this experiment, we will create a market in which you will act as bidders in a series of auctions. There will be six different items for sale in each - items A, B, C, D, E and F – with one unit of each item for sale in each auction. These items will be sold using a simultaneous ascending price auction (SAA) procedure to be described shortly.

1. **Value of the items for sale:** Each item will have a stand alone value – the value of purchasing the item by itself – along with a possible synergy value associated with purchasing two or more items.

    The following picture may help to clarify things: In each case the stand alone value of each item is in the box.

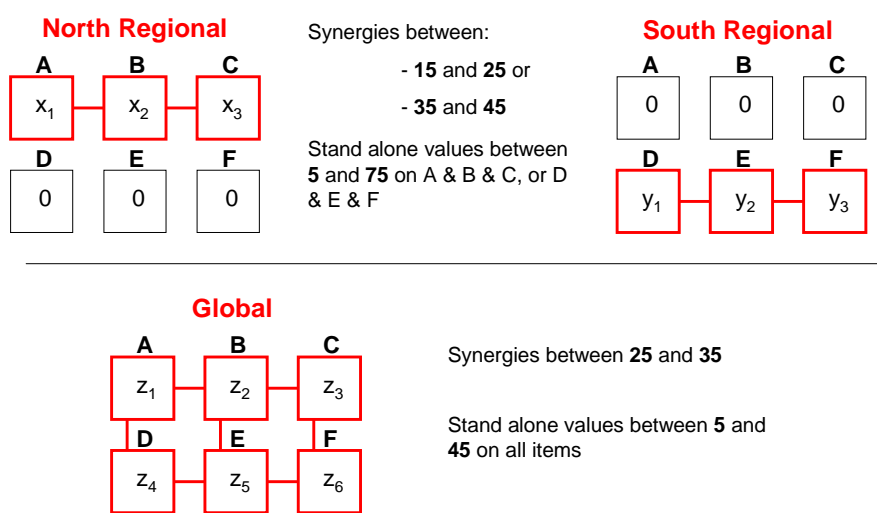In this case the stand alone value of A is 10, B is 12, etc.

Further, there are possible synergies associated with purchasing 2 or more items as indicated by the arcs and the numbers next to the arcs. In this case the synergy associated with purchasing **both** A **and** D is 6. So that the total value of purchasing both A and D would be 21, whereas if that same bidder purchased A by itself it would be worth 10 and D by itself would be worth 5.

One way to think about this set-up is to imagine these 6 items as articles of clothing. For example, A could be a shirt, B a pair of pants and D another pair of pants. You value each of these items individually, but you like some more than others so they have higher stand alone values, and there could be synergies between the items that can be worn together. For example, since shirt A goes particularly well with pants D you get a synergy bonus (or extra satisfaction) from having them both, in addition to what

they are worth on their own. On the other hand, you probably don't get a synergy from having pants B and pants D since you're unlikely to wear the two together. In that case, having B and D is only worth the sum of their stand alone values.

For today's experiment and those of the next two sessions there will be 3 bidders in each market – 2 regional bidders and 1 global bidder – with the following valuations and synergy structure.

Valuations for Today's Experiment

North Regional

A	B	C
x_1	x_2	x_3

D	E	F
0	0	0

Synergies between:
- **15** and **25** or
- **35** and **45**

Stand alone values between **5** and **75** on A & B & C, or D & E & F

South Regional

A	B	C
0	0	0

D	E	F
y_1	y_2	y_3

Global

A	B	C
z_1	z_2	z_3

D	E	F
z_4	z_5	z_6

Synergies between **25** and **35**

Stand alone values between **5** and **45** on all items

Your role as a regional or global bidder will change randomly from auction to auction as will your valuations and the other bidders in your market.

The North regional bidder will be interested in items A, B and C placing positive value on these items with zero value for the others. There will be positive synergies between items AB and BC for the North regional bidder. Similarly, the South regional bidder will be interested in items D, E, and F placing positive value on these items with zero value for the others. There will be positive synergies between items DE and EF for the South regional bidder.

The global bidder has positive value for all 6 items and positive synergies between pairs AB, BC, DE, EF, AB, BE, and CF.

The stand alone values for the regional bidders will be integer values between 5 and 75, with either low synergy values (integers between 5 and 15) or high synergy values (integers between 25 and 35). Which synergy regime we will be in for the regional bidders will be announced in advance (and will always be the same for both regional bidders).

The stand alone values for the global bidder for each item will be integer values from the interval 5 and 45, with synergy values between 25 and 35 in all cases.

You will be informed of your stand alone values and your synergy values on your computer screen at the start of each auction. For the North regional bidder this will look like the following:

North Regional Bidder's values:

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
55.0	22.0	51.0	0.0	0.0	0.0	true	true	false	false	false	false	false	0.0	32.0

The North regional bidder's stand alone values in this example are A = 55, B = 22, C = 51, with zero value for the remaining items. Further, the synergy value for purchasing A and B is 32, with the synergy value for purchasing B and C 32 as well.

The Screen for the South Regional bidder will be very similar with positive stand alone values for D, E, and F and with a synergy bonus for purchasing each of DE and EF.

Global Bidder's values:

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
17.0	35.0	31.0	32.0	25.0	26.0	true	true	true	true	true	true	true	0.0	33.0

The global bidder's stand alone values in this example are A = 17, B = 35, C = 31, D = 32, E = 25, F = 26, with a synergy bonus for purchasing each of the relevant pairs such as AB and BC of 33 each.

Note that the synergy value for purchasing any pair of items will always be the same and will always be a constant equal to the Synergy Constant. The North regional bidder will always have a synergy value associated with purchasing AB and BC. Similarly the South regional bidder will always have a synergy bonus for purchasing DE and EF. And the global bidder will have a synergy bonus associated with each of the pairs listed.

Note that your stand alone value for items as well as your synergy values will change from auction to auction and will rarely, if ever, be the same for different bidders within a given auction.

2. **Auction procedures:** Items will be sold using a simultaneous ascending auction (SAA) procedure. This works as follows: The auction will proceed in rounds, with each round lasting for 30 seconds during which you can place a bid. As long as there are more bids placed on each item than the supply of that item (i.e., there is excess demand for the item) the auction will continue and the prices for the items with excess demand will increase.

The auction ends once there is no longer any excess demand for any items; that is once total demand is less than or equal to total supply for each item. At that time each item will be sold to the high bidder for that item at the current price.

So looking back at Example 2 if this bidder was the high bidder for items A and B whose prices were 40 and 25 respectively this bidder would earn profits of 20: The stand alone values of A and B (17 + 35) plus the synergy value of getting both A *and* B (33) less the sum of the prices of A and B (65).

And if this bidder had earned items A, B and C whose prices were 40, 25 and 50, respectively, they would earn profits of 34: The sum of the stand alone values of A, B and C (83) plus the synergy values of earning both A *and* B (33) and B *and* C (33) less the sum of the prices for A, B, and C (115)

You can see that its possible – and sometimes sensible – to bid above your stand alone values for an item because of the synergies associated with earning pairs of items. Such a strategy has potential rewards as well as potential risks. The potential rewards come in the form of securing the synergy payoff(s) associated with getting pairs of items. The potential risks come from the possibility of getting only one of the items in the pair while bidding above that item's stand alone value. What should you do? If we knew that we would not have to run the experiment.

Most of today will be spent familiarizing you with the auction procedures, including a few practice and real auctions.

In each auction there will be 3 bidders. There are a total of _____ you in the room so we will be conducting _____ auctions simultaneously, with 3 bidders in each auction. Who will be assigned to bid in your auction will be determined randomly for each auction so it is very unlikely you will be bidding against the same people in any given auction. One side effect of this is that we must wait for all the auctions to be completed before moving on to another auction. So you may be idle for a bit after your auction has finished.

In addition if there are an uneven number of subjects present relative to the number of bidders in each auction market, you may be on standby for a given auction. But you will be guaranteed to be active in the next auction period.

As in the real auctions you will each be given starting capital balances of 180 experimental currency units (ECUs). (All values in the session will be in terms of ECUs). For the real auctions to be conducted in the next two sessions any profits earned in an auction will be added to your starting capital balances. Any losses will be subtracted from it. You total earnings for a session will consist of your end of session balance, less 130 ECUs, and will be converted into US Dollars at a rate of
1 ECU = 0.xx US dollars. (The actual rate will be determined in the next session.)

You will all be paid $10 for today's session which will consist of familiarizing you with the software and conducting several practice auctions. We'll start to play for cash in the next two sessions.

Dry run instructions:

Login instructions: *Note we will have to hand them login inf. Will use their OSU e-mail addresses as their ID number. Will also have to post which exp number working with. I think they can set their own password.*

This is a dry run. Please don't do anything until we ask you to do so, so that we can familiarize you with the information layout.

Please look at your screens now. At the upper left hand corner it shows we are in Period 1, Round 1 meaning we are in the first round of Auction 1. Round duration shows how much time you have to place a bid. It's 30 seconds in the auctions we will run. Right next to that – Round Time Remaining – shows how much time is left to make your bid. Next to that is your staring capital balance - $150 in this example – followed by your current balance (your starting balance plus any profits or losses from previous auctions), followed by the profit or loss from the current auction. The clock is paused right now so we can go through your screens with you.

Right below this are the items for sale – A, B, C, D, E and F along with the number of units of each item for sale (offer quantity) – which will always be 1 – followed by the

current round price and the price increment – the price increase from the last round to the current round. Prices will start at 5 and increase by 5 between all rounds.

Right below this is a line specifying Your minimum bid *(E points to this)* followed by a line specifying "Pay Prices" (*E points to this too*). Don't worry about these for now – we will come back to them later.

Shown to the right is your total eligibility for the current round of bidding. (*E points to this*). Eligibility rules work as follows: In each auction you will start out with eligibility to bid on all items up for sale – 6 in this case. However, if in any given round of the auction you fail to bid on an item your total eligibility in all subsequent rounds will be reduced to the number of items you bid on in that round.

Below this under the heading "Currently Demanded Bids" your screen will show your bid for the current round. At the start of each auction this will be the package containing 1 unit of each item *(E points to this – should be a screen shot for a regional bidder)*. We start with this bid so that everyone begins with maximum eligibility. We'll come back to how to change bids and what happens in a moment.

Below this is the information regarding your stand alone values for each item, along with which pairs will generate synergies. This example is for a South regional bidder with stand alone values for D = 42, E = 37, F = 22, and A = B = C = 0 as well a synergy bonus for the pairs DE and EF = 32. *(Note – the experimenter will be pointing to these items on the slide as he goes through the example.)*

Below this is the list of *all* possible bids you could make. The list is quite large even for this simple case of six units for sale. To help you make sense of this we have provided you with the ability to sort the outcomes by different criteria – value, current cost, current profit, etc. In addition, we have provided check boxes which allow you to concentrate on items of particular interest and which are always sorted first. Each bidder will start the auction with at least two bids checked: the bid for all items and the bid for no items. For the South regional bidders we have also put a check next to all the bids which contain only the items D, E or F as these are likely to be the bids of primary interest. (All the other bids contain items (such as A, B, or C) which are of no value but which you would still have to pay for in bidding on them.) We've done the same thing for the North regional bidders corresponding to the items for which they have positive value. Any bids with a check mark will be sorted first by the criteria you choose and placed at the top. Bids without check marks will then be sorted by the same criteria and placed below the checked bids. So take your curser and click on the little circle under the first sort criteria – Value. Try this now. Does everyone see this?

The next column allows you to sort based on Current Profit. This will list all possible bids from highest to lowest based on the Current Profit for each bid. Here too – the checked bids will be sorted first by this criteria followed all the other bids. Try this now to see how it works.

Note that these calculations for total profit and total value are conditional on getting all the items in question: For example, the total value for E and F is listed at 91 which is conditional on getting both items and the synergy bonus that goes with them. As the examples that follow will show there is no guarantee that this bidder will be able to

acquire both items.

Next you can sort by profit divided by value.

Next you can sort by last round submitted, by past cost, by past profit, by the decrease in profit, and by synergy value. *(E points to these columns as he goes through them.)* These are a lot of sort options. We have provided them because we do not know what you might want to do or what will work best for you. Please play with these a bit to see how they work.

Note that if you are a global bidder, you will only have two packages checked to begin with since you have value for all items. However, after you have placed a bid – in whatever round – it will get a check next to it, and any subsequent sorts will sort these bids first, followed by the remaining bids. (The same will hold true for the regional bidder should they submit a bid that does not start out with a check mark.)

Note that both regional and global bidders can drop the check mark on any bid simply by clicking on the little box with the check. This will drop the bid into the second tier of the sort. You probably want to keep the bid with zero demand for all items checked, since you will want to bid on that package once you decide prices are too high to buy any of the items. Also note that regional bidders are not obliged to only submit bids with checks next to them to begin with. We've adopted the two tier sorting procedure because we think it might be helpful to you.

Any questions?

We'll give you a minute or two to play with these sort possibilities. Check some boxes and uncheck others and try sorting. We want to make sure you have practice with all the things that might help you in the auction. You will really want to use these one or two of the sort criteria to help you to bid since there are so many possible items to bid on its almost impossible to bid intelligently without using these aids.

Finally, we should note that any bid that would yield negative profit at current prices will have the "current profit" entry highlighted in red. This is designed to make it easier to identify such bids. For example, in this slide you can see that at the current prices the potential profit is negative for a South regional bidding on A alone (-5), B alone (also -5), A and B (-10), etc...

Any questions?

How to bid: As noted each auction begins with the Currently demanded bid being the package with all items in it. This is done to insure that everyone starts with maximum eligibility. If this is not what you want to bid on – and it may well not be - just click on "set" for another package. When you do this and the package you prefer contains fewer items than the original package, you will be given a warning that your eligibility will be reduced. As such you must click on Confirm space to replace the package. If you don't click on the confirm button before the round ends, the package you want to bid on will not be entered in place of the starting package. We do this because we do not want people to inadvertently reduce their eligibility since once it's reduced and the round ends,

you can't restore your eligibility, it's lost for the remainder of the current auction.

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| Experiment: 0009 | Design: Simultaneous Ascending | Valuation: Geographic | Date Started: |

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	1	Ready to start round	30	30	150.0	150.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F	
Offer quantity:	1	1	1	1	1	1	
Current round price:	5	5	5	5	5	5	
Price increment:	---	---	---	---	---	---	
Your minimum bid:	0	0	0	0	0	0	Your total eligibility is: 6
Pay prices:	---	---	---	---	---	---	

Currently demanded bids

Package	Value	Cost	Potential Profit
1, 1, 1, 1, 1, 1	165.0	30.0	135.0

New Bid 0, 0, 0, 1, 1, 1. Eligibility will be reduced to 3 in the next round.
CONFIRM

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
0.0	0.0	0.0	42.0	37.0	22.0	false	false	false	false	false	true	true	0.0	32.0

Analytics | Previous period results

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
		●	○	○	○	○	○	○	○	○	○
set	☑	0, 0, 0, 0, 0, 0	0.0	0.0	0.0	0.000	none	0.0	0.0	0.0	0.0
set	☑	0, 0, 0, 1, 0, 0	42.0	5.0	37.0	0.881	none	0.0	0.0	0.0	0.0
set	☑	0, 0, 0, 0, 1, 0	37.0	5.0	32.0	0.865	none	0.0	0.0	0.0	0.0
set	☑	0, 0, 0, 1, 1, 0	111.0	10.0	101.0	0.910	none	0.0	0.0	0.0	32.0
set	☑	0, 0, 0, 0, 0, 1	22.0	5.0	17.0	0.773	none	0.0	0.0	0.0	0.0
set	☑	0, 0, 0, 1, 0, 1	64.0	10.0	54.0	0.844	none	0.0	0.0	0.0	0.0
set	☑	0, 0, 0, 0, 1, 1	91.0	10.0	81.0	0.890	none	0.0	0.0	0.0	32.0
set	☑	0, 0, 0, 1, 1, 1	165.0	15.0	150.0	0.909	none	0.0	0.0	0.0	64.0
set	☑	1, 1, 1, 1, 1, 1	165.0	30.0	135.0	0.818	none	0.0	0.0	0.0	64.0
set	☐	1, 0, 0, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
set	☐	0, 1, 0, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
set	☐	1, 1, 0, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
set	☐	0, 0, 1, 0, 0, 0	0.0	5.0	-5.0	0.000	none	0.0	0.0	0.0	0.0
set	☐	1, 0, 1, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
set	☐	0, 1, 1, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	0.0	0.0
set	☐	1, 1, 1, 0, 0, 0	0.0	15.0	-15.0	0.000	none	0.0	0.0	0.0	0.0
set	☐	1, 0, 0, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	0.0	0.0

In this example the South regional bidder chose to bid on a package containing one unit of D, one of E and one of F, no longer bidding on items A, B and C. For this package to replace the starting one – he/she must click on the CONFIRM. (*(E points to this.)*

Please pick out a package with a zero for at least one of the items and click on "set" next to it to see how this works. Also confirm this bid. Since the list of possible bids is so long and can take up your entire screen you may need to scroll to the top to see and click on Confirm after setting your bid. (Of course if this was a real auction you would not want to do this if you are happy with the starting round package – this is strictly up to you to decide when we play for cash. Right now we only want you to see how the software works.)

OK has everyone done this?

Now you can change your bid and restore your eligibility *within a given round*, *but not between rounds*. So click on "set" next to a package that restores some eligibility to see how this works. Note that should you then change your mind again within a given round and click on a package that reduces your eligibility, you will not see the warning about

reduced eligibility again. So try this too.

OK we are going to re-start the clock now – to let you bid for this round and then go on to see what happens in the next round. Please make your bids.

You are signed in as Subject: s2

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| Experiment: 0009 | Design: Simultaneous Ascending | Valuation: Geographic | Date Started: |

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	2	Ready to start round	30	30	150.0	150.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F	
Offer quantity:	1	1	1	1	1	1	
Current round price:	10	10	10	10	10	10	
Price increment:	5	5	5	5	5	5	
Your minimum bid:	0	0	0	0	0	0	Your total eligibility is: 3
Pay prices:	---	---	---	---	---	---	

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 1, 1, 1	165.0	30.0	135.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
0.0	0.0	0.0	42.0	37.0	22.0	false	false	false	false	false	true	true	0.0	32.0

Analytics | Previous period results

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
set	☑	0, 0, 0, 0, 0, 0	0.0	0.0	0.0	0.000	none	0.0	0.0	0.0	0.0
set	☑	0, 0, 0, 1, 0, 0	42.0	10.0	32.0	0.762	none	0.0	0.0	-32.0	0.0
set	☑	0, 0, 0, 0, 1, 0	37.0	10.0	27.0	0.730	none	0.0	0.0	-27.0	0.0
set	☑	0, 0, 0, 1, 1, 0	111.0	20.0	91.0	0.820	none	0.0	0.0	-91.0	32.0
set	☑	0, 0, 0, 0, 0, 1	22.0	10.0	12.0	0.545	none	0.0	0.0	-12.0	0.0
set	☑	0, 0, 0, 1, 0, 1	64.0	20.0	44.0	0.688	none	0.0	0.0	-44.0	0.0
set	☑	0, 0, 0, 0, 1, 1	91.0	20.0	71.0	0.780	none	0.0	0.0	-71.0	32.0
set	☑	0, 0, 0, 1, 1, 1	165.0	30.0	135.0	0.818	1	15.0	150.0	15.0	64.0
set	☐	1, 0, 0, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	10.0	0.0
set	☐	0, 1, 0, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	10.0	0.0
set	☐	1, 1, 0, 0, 0, 0	0.0	20.0	-20.0	0.000	none	0.0	0.0	20.0	0.0
set	☐	0, 0, 1, 0, 0, 0	0.0	10.0	-10.0	0.000	none	0.0	0.0	10.0	0.0
set	☐	1, 0, 1, 0, 0, 0	0.0	20.0	-20.0	0.000	none	0.0	0.0	20.0	0.0
set	☐	0, 1, 1, 0, 0, 0	0.0	20.0	-20.0	0.000	none	0.0	0.0	20.0	0.0
set	☐	1, 1, 1, 0, 0, 0	0.0	30.0	-30.0	0.000	none	0.0	0.0	30.0	0.0
set	☐	1, 0, 0, 1, 0, 0	42.0	20.0	22.0	0.524	none	0.0	0.0	-22.0	0.0
set	☐	0, 1, 0, 1, 0, 0	42.0	20.0	22.0	0.524	none	0.0	0.0	-22.0	0.0

OK – this slide shows what you are likely to see after round 1. (Again we have stopped the clock so you can see this slide as well as look at your screens.) We are in round 2. The current round prices for each item are shown just below the offer quantity in each case along with the price increment for each item. (This will always be 5 in today's experiment.)

The package under currently demand bid is the last one you added (and confirmed) in the previous round, or if you did not add a new package, the one from the previous round. In our example here the bidder chose a package that reduced here her eligibility to 3. As such she is no longer permitted to bid on packages that require greater eligibility. Packages that you are no longer eligible to bid on will be dropped to the bottom of your screen and will be noted as "ineligible to bid on". (*E points to this.*)

ineligible	1, 1, 1, 1, 0, 0	42.0	40.0	2.0	0.048	none	0.0	0.0	-2.0	0.0
ineligible	1, 1, 1, 0, 1, 0	37.0	40.0	-3.0	-0.081	none	0.0	0.0	3.0	0.0
ineligible	1, 1, 0, 1, 1, 0	111.0	40.0	71.0	0.640	none	0.0	0.0	-71.0	32.0
ineligible	1, 0, 1, 1, 1, 0	111.0	40.0	71.0	0.640	none	0.0	0.0	-71.0	32.0
ineligible	0, 1, 1, 1, 1, 0	111.0	40.0	71.0	0.640	none	0.0	0.0	-71.0	32.0
ineligible	1, 1, 1, 1, 1, 0	111.0	50.0	61.0	0.550	none	0.0	0.0	-61.0	32.0
ineligible	1, 1, 1, 0, 0, 1	22.0	40.0	-18.0	-0.818	none	0.0	0.0	18.0	0.0
ineligible	1, 1, 0, 1, 0, 1	64.0	40.0	24.0	0.375	none	0.0	0.0	-24.0	0.0
ineligible	1, 0, 1, 1, 0, 1	64.0	40.0	24.0	0.375	none	0.0	0.0	-24.0	0.0
ineligible	0, 1, 1, 1, 0, 1	64.0	40.0	24.0	0.375	none	0.0	0.0	-24.0	0.0
ineligible	1, 1, 1, 1, 0, 1	64.0	50.0	14.0	0.219	none	0.0	0.0	-14.0	0.0
ineligible	1, 1, 0, 0, 1, 1	91.0	40.0	51.0	0.560	none	0.0	0.0	-51.0	32.0
ineligible	1, 0, 1, 0, 1, 1	91.0	40.0	51.0	0.560	none	0.0	0.0	-51.0	32.0
ineligible	0, 1, 1, 0, 1, 1	91.0	40.0	51.0	0.560	none	0.0	0.0	-51.0	32.0
ineligible	1, 1, 1, 0, 1, 1	91.0	50.0	41.0	0.451	none	0.0	0.0	-41.0	32.0
ineligible	1, 0, 0, 1, 1, 1	165.0	40.0	125.0	0.758	none	0.0	0.0	-125.0	64.0
ineligible	0, 1, 0, 1, 1, 1	165.0	40.0	125.0	0.758	none	0.0	0.0	-125.0	64.0
ineligible	1, 1, 0, 1, 1, 1	165.0	50.0	115.0	0.697	none	0.0	0.0	-115.0	64.0
ineligible	0, 0, 1, 1, 1, 1	165.0	40.0	125.0	0.758	none	0.0	0.0	-125.0	64.0
ineligible	1, 0, 1, 1, 1, 1	165.0	50.0	115.0	0.697	none	0.0	0.0	-115.0	64.0
ineligible	0, 1, 1, 1, 1, 1	165.0	50.0	115.0	0.697	none	0.0	0.0	-115.0	64.0
ineligible	1, 1, 1, 1, 1, 1	165.0	60.0	105.0	0.636	none	0.0	0.0	-105.0	64.0

Note, what the reduction in eligibility does is to prevent you from submitting a bid containing more items than in your current bid. It does, however, allow you to submit a bid containing different items, so long as the package does not contain more items than you are eligible to bid on. For example, the bidder in this example can bid on D alone as well as D and E or even D, E and A, but not on one containing D, E, F and A as this requires an eligibility level of 4 or more and their current eligibility is 3.

 Special properties of the SAA:

Minimum bid requirement: The minimum bid requirement will kick in once there is no longer any excess demand for an item and you are the current high bidder for that item. What the minimum bid requirement means is that you are obliged to maintain your bid for the item with the minimum requirement unless someone else tops your bid for that item. This holds regardless of whether or not you are earning a positive profit on this item or set of items.

The following screen shots show a case in which the minimum bid requirement kicks in. We will walk you through it. In round 7 – shown here – the South regional bidder places a bid on D, E and F.   There was excess demand for these three items in round 6 as indicated by the fact that their prices increased by 5 heading into round 7.

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Experiment: 0010	Design: Simultaneous Ascending	Valuation: Geographic	Date Started:			
Period	**Round**	**Experiment Status**	**Round Duration**	**Round Time Remaining**	**Experiment Starting ($)**	**Current Balance ($)**	**Profit / Loss ($)**
1	7	Ready to start round	30	30	150.0	150.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F	
Offer quantity:	1	1	1	1	1	1	
Current round price:	25	30	30	30	30	30	
Price increment:	0	5	5	5	5	5	
Your minimum bid:	0	0	0	0	0	0	Your total eligibility is: 3
Pay prices:	---	---	---	---	---	---	

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 1, 1, 1	165.0	90.0	75.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
0.0	0.0	0.0	42.0	37.0	22.0	false	false	false	false	false	true	true	0.0	32.0

Analytics | **Previous period results**

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
		⊙	○	○	○	○	○	○	○	○	○
set	☑	0, 0, 0, 0, 0, 0	0.0	0.0	0.0	0.000	none	0.0	0.0	0.0	0.0
set	☑	0, 0, 0, 1, 0, 0	42.0	30.0	12.0	0.286	none	0.0	0.0	-12.0	0.0
set	☑	0, 0, 0, 0, 1, 0	37.0	30.0	7.0	0.189	none	0.0	0.0	-7.0	0.0
set	☑	0, 0, 0, 1, 1, 0	111.0	60.0	51.0	0.459	none	0.0	0.0	-51.0	32.0
set	☑	0, 0, 0, 0, 0, 1	22.0	30.0	-8.0	-0.364	none	0.0	0.0	8.0	0.0
set	☑	0, 0, 0, 1, 0, 1	64.0	60.0	4.0	0.062	none	0.0	0.0	-4.0	0.0
set	☑	0, 0, 0, 0, 1, 1	91.0	60.0	31.0	0.341	none	0.0	0.0	-31.0	32.0
set	☑	0, 0, 0, 1, 1, 1	165.0	90.0	75.0	0.455	6	75.0	90.0	15.0	64.0
set	☐	1, 0, 0, 0, 0, 0	0.0	25.0	-25.0	0.000	none	0.0	0.0	25.0	0.0
set	☐	0, 1, 0, 0, 0, 0	0.0	30.0	-30.0	0.000	none	0.0	0.0	30.0	0.0
set	☐	1, 1, 0, 0, 0, 0	0.0	55.0	-55.0	0.000	none	0.0	0.0	55.0	0.0
set	☐	0, 0, 1, 0, 0, 0	0.0	30.0	-30.0	0.000	none	0.0	0.0	30.0	0.0
set	☐	1, 0, 1, 0, 0, 0	0.0	55.0	-55.0	0.000	none	0.0	0.0	55.0	0.0
set	☐	0, 1, 1, 0, 0, 0	0.0	60.0	-60.0	0.000	none	0.0	0.0	60.0	0.0
set	☐	1, 1, 1, 0, 0, 0	0.0	85.0	-85.0	0.000	none	0.0	0.0	85.0	0.0
set	☐	1, 0, 0, 1, 0, 0	42.0	55.0	-13.0	-0.310	none	0.0	0.0	13.0	0.0
set	☐	0, 1, 0, 1, 0, 0	42.0	60.0	-18.0	-0.429	none	0.0	0.0	18.0	0.0

This next slide shows the situation in round 8 for the South regional bidder. There is no longer excess demand for item F (the price increment is 0) as the other(s) bidding on it did not submit a bid containing F in round 7. And since this bidder submitted a bid for F—along with D and E—in round 7 she is obliged to maintain her bid on F at the round 7 price of 30. You can see that the minimum bid requirement has kicked in because there is a 1 below item F in the row for the minimum bid requirement. Notice now that not only are packages requiring more than 3 units of eligibility unavailable but so are any packages not containing item F. (*E points to this.*)

You are signed in as Subject: s1

| Home | Sign out |

Experiment: 0010   Design: Simultaneous Ascending   Valuation: Geographic   Date Started:

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	8	Ready to start round	30	30	150.0	150.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F		
Offer quantity:	1	1	1	1	1	1		
Current round price:	30	35	35	35	35	30		
Price increment:	5	5	5	5	5	0		
Your minimum bid:	0	0	0	0	0	1	Your total eligibility is: 3	
Pay prices:	---	---	---	---	---	---		

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 0, 0, 1, 1, 1	165.0	100.0	65.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
0.0	0.0	0.0	42.0	37.0	22.0	false	false	false	false	false	true	true	0.0	32.0

Analytics | Previous period results

		Package	Value	Current cost	Profit/ profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
		⊙	○	○	○	○	○	○	○	○	○
set	☑	0, 0, 0, 0, 0, 1	22.0	30.0	-8.0	-0.364	none	0.0	0.0	8.0	0.0
set	☑	0, 0, 0, 1, 0, 1	64.0	65.0	-1.0	-0.016	none	0.0	0.0	1.0	0.0
set	☑	0, 0, 0, 0, 1, 1	91.0	65.0	26.0	0.286	none	0.0	0.0	-26.0	32.0
set	☑	0, 0, 0, 1, 1, 1	165.0	100.0	65.0	0.394	7	90.0	75.0	10.0	64.0
set	☐	1, 0, 0, 0, 0, 1	22.0	60.0	-38.0	-1.727	none	0.0	0.0	38.0	0.0
set	☐	0, 1, 0, 0, 0, 1	22.0	65.0	-43.0	-1.955	none	0.0	0.0	43.0	0.0
set	☐	1, 1, 0, 0, 0, 1	22.0	95.0	-73.0	-3.318	none	0.0	0.0	73.0	0.0
set	☐	0, 0, 1, 0, 0, 1	22.0	65.0	-43.0	-1.955	none	0.0	0.0	43.0	0.0
set	☐	1, 0, 1, 0, 0, 1	22.0	95.0	-73.0	-3.318	none	0.0	0.0	73.0	0.0
set	☐	0, 1, 1, 0, 0, 1	22.0	100.0	-78.0	-3.545	none	0.0	0.0	78.0	0.0
set	☐	1, 0, 0, 1, 0, 1	64.0	95.0	-31.0	-0.484	none	0.0	0.0	31.0	0.0
set	☐	0, 1, 0, 1, 0, 1	64.0	100.0	-36.0	-0.562	none	0.0	0.0	36.0	0.0
set	☐	0, 0, 1, 1, 0, 1	64.0	100.0	-36.0	-0.562	none	0.0	0.0	36.0	0.0
set	☐	1, 0, 0, 0, 1, 1	91.0	95.0	-4.0	-0.044	none	0.0	0.0	4.0	32.0
set	☐	0, 1, 0, 0, 1, 1	91.0	100.0	-9.0	-0.099	none	0.0	0.0	9.0	32.0
set	☐	0, 0, 1, 0, 1, 1	91.0	100.0	-9.0	-0.099	none	0.0	0.0	9.0	32.0
ineligible		0, 0, 0, 0, 0, 0	0.0	0.0	0.0	0.000	none	0.0	0.0	0.0	0.0

Price increase rules: Prices will increase as long as there is excess demand for items. They will increase by 5 in each round for all items with excess demand. Prices for items with no excess demand remain constant.

Rollback rules and Pay prices:

Prices increase by 5 from round to round. As such there will be times near the end of the auction where following a price increase several bidders drop their demand for an item at the same time so demand for the item goes from positive to zero. When this happens we will employ the following price rollback procedure to determine who gets that item and at what price.

1. We essentially cancel *all* the bids in the round for which demand for *any* item goes from excess demand to zero.
2. The computer randomly assigns the item to one of the bidders who bid on the item in the previous round at a price they had been willing to pay for it. In exchange for this, the bidder assigned the item will have a minimum bid requirement for that item until someone else decides to bid on it.
3. The auction round that was cancelled then repeats itself with the Pay price applying to the bidder randomly assigned the item. Anyone else wanting that item will have to pay the current round price, which is the same as the price in round where demand for the item went to 0.
4. The auction then continues in the usual way.

In short, in those (infrequent) cases where the price increases and demand for an item that had excess demand drops to zero, rather than not selling the item, it will be randomly assigned to one of the bidders who had bid on the item at a price they had been willing to pay for it. Further, anyone else wanting the item will have to pay a higher price for it. In exchange for this, the bidder assigned the item will have a minimum bid requirement for that item until someone else decides to bid on it. (Note, this price rollback procedure is necessary to keep the auction moving along in a timely manner.)

The next couple of slides provide an example of where the price rollback rule kicks in. In round 4 (not shown here) the global bidder with positive values for all 6 items placed a bid for all the items when each price was equal to 20. There was excess demand for each item so their prices increased to 25 in round 5. We pick up the example in round 5 where we assume that the global bidder decides to stop bidding on A and submits a bid for BCDEF. The next slide shows the global bidder's screen in round 5.

Home | Sign out

| Experiment: 0009 | Design: Simultaneous Ascending | Valuation: Geographic | Date Started: |

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	5	Clock Paused	30	28	150.0	150.0	0.0

Current auctioneer offer

Item:	A	B	C	D	E	F	
Offer quantity:	1	1	1	1	1	1	
Current round price:	25	25	25	25	25	25	
Price increment:	5	5	5	5	5	5	
Your minimum bid:	0	0	0	0	0	0	Your total eligibility is: 6
Pay prices:	---	---	---	---	---	---	

Currently demanded bids

Package	Value	Cost	Potential Profit
0, 1, 1, 1, 1, 1	314.0	125.0	189.0

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
17.0	35.0	31.0	32.0	25.0	26.0	true	true	true	true	true	true	true	0.0	33.0

Analytics | Previous period results

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
set	☑	0, 0, 0, 0, 0, 0	0.0	0.0	0.0	0.000	none	0.0	0.0	0.0	0.0
set	☑	1, 1, 1, 1, 1, 1	397.0	150.0	247.0	0.622	4	120.0	277.0	30.0	231.0
set	☐	1, 0, 0, 0, 0, 0	17.0	25.0	-8.0	-0.471	none	0.0	0.0	8.0	0.0
set	☐	0, 1, 0, 0, 0, 0	35.0	25.0	10.0	0.286	none	0.0	0.0	-10.0	0.0
set	☐	1, 1, 0, 0, 0, 0	85.0	50.0	35.0	0.412	none	0.0	0.0	-35.0	33.0
set	☐	0, 0, 1, 0, 0, 0	31.0	25.0	6.0	0.194	none	0.0	0.0	-6.0	0.0
set	☐	1, 0, 1, 0, 0, 0	48.0	50.0	-2.0	-0.042	none	0.0	0.0	2.0	0.0
set	☐	0, 1, 1, 0, 0, 0	99.0	50.0	49.0	0.495	none	0.0	0.0	-49.0	33.0
set	☐	1, 1, 1, 0, 0, 0	149.0	75.0	74.0	0.497	none	0.0	0.0	-74.0	66.0
set	☐	0, 0, 0, 1, 0, 0	32.0	25.0	7.0	0.219	none	0.0	0.0	-7.0	0.0
set	☐	1, 0, 0, 1, 0, 0	82.0	50.0	32.0	0.390	none	0.0	0.0	-32.0	33.0
set	☐	0, 1, 0, 1, 0, 0	67.0	50.0	17.0	0.254	none	0.0	0.0	-17.0	0.0
set	☐	1, 1, 0, 1, 0, 0	150.0	75.0	75.0	0.500	none	0.0	0.0	-75.0	66.0
set	☐	0, 0, 1, 1, 0, 0	63.0	50.0	13.0	0.206	none	0.0	0.0	-13.0	0.0
set	☐	1, 0, 1, 1, 0, 0	113.0	75.0	38.0	0.336	none	0.0	0.0	-38.0	33.0
set	☐	0, 1, 1, 1, 0, 0	131.0	75.0	56.0	0.427	none	0.0	0.0	-56.0	33.0
set	☐	1, 1, 1, 1, 0, 0	214.0	100.0	114.0	0.533	none	0.0	0.0	-114.0	99.0

Now suppose whoever else was bidding on A in round 4 also stopped bidding on it in round 5. At this point the price rollback rule kicks in so the computer must randomly assign item A to one the bidders at the end of round 5 – the global bidder in our example.

This shows up in round 6 where the global bidder has a minimum bid requirement for item A (*E points to this and all other key items*) and a Pay Price for A of 20 – meaning that's the price this bidder will have to pay for A (the round 4 price). Current round prices are at 25 – the same as in round 5 (as this is a "do over" for round 5). Further, 25 is what anyone else wanting A will have to pay for A in round 6. Also, notice that eligibility for the global bidder is still at 6, the same as in round 5, as this is a "do over" for round 5, so that eligibility for everyone is the same as it was in round 5. Finally, as with all minimum bid requirements, it can only be removed for the global bidder if someone else bids on A.

There is one final important thing to notice about situations in which price rollback occurs. After the rollback, for each bidder, the default bid in your "Currently demanded bid" will revert to what it was at the start of the do-over round (in this example it goes back to the bid submitted in round 4). So be aware that in do-over rounds following a price rollback, your "Currently demanded bid" will revert back as well, so you need to pay special attention to determine if you still want to maintain that bid at the do-over round prices and at whatever minimum bid requirement(s) you may now be facing.

OK – I'm going to start the clock and you will continue to bid in rounds until the auction is completed. If you have any questions – raise your hand and one of us will be around to answer your question. This is still a dry run to get you used to the software and auction rules.

Remember – since there is more than one group bidding, your auction may end while the other is still going on and you will not be allowed to move on until all the auctions have been completed.

Let auction run to completion.

OK – all the auction groups have finished.

So long as your group is not the last to finish your screen will look like the following when your auction is complete.

					Home	Sign out

Experiment: 0011	Design: Simultaneous Ascending	Valuation: Geographic	Date Started:			

Period	Round	Experiment Status	Round Duration	Round Time Remaining	Experiment Starting ($)	Current Balance ($)	Profit / Loss ($)
1	10	Ready to start round	30	30	150.0	152.0	2.0

Current auctioneer offer

Your group is finished, please wait for the other groups to finish

Currently demanded bids

Your group is finished, please wait for the other groups to finish

This period's valuation

ItemA	ItemB	ItemC	ItemD	ItemE	ItemF	Arc AB	Arc BC	Arc AD	Arc BE	Arc CF	Arc DE	Arc EF	Synergy Factor	Synergy Constant
17.0	35.0	31.0	32.0	25.0	26.0	true	true	true	true	true	true	true	0.0	33.0

Analytics | **Previous period results**

		Package	Value	Current cost	Current profit	Profit/ value	Last round submitted	Past cost	Past profit	Decrease profit	Synergy
		⊙	○	○	○	○	○	○	○	○	○
set	☑	1, 0, 0, 1, 0, 0	82.0	80.0	2.0	0.024	8	80.0	2.0	0.0	33.0
ineligible		0, 0, 0, 0, 0, 0	0.0	0.0	0.0	0.000	none	0.0	0.0	0.0	0.0
ineligible		1, 0, 0, 0, 0, 0	17.0	40.0	-23.0	-1.353	none	0.0	0.0	23.0	0.0
ineligible		0, 1, 0, 0, 0, 0	35.0	40.0	-5.0	-0.143	none	0.0	0.0	5.0	0.0
ineligible		1, 1, 0, 0, 0, 0	85.0	80.0	5.0	0.059	none	0.0	0.0	-5.0	33.0
ineligible		0, 0, 1, 0, 0, 0	31.0	40.0	-9.0	-0.290	none	0.0	0.0	9.0	0.0
ineligible		1, 0, 1, 0, 0, 0	48.0	80.0	-32.0	-0.667	none	0.0	0.0	32.0	0.0
ineligible		0, 1, 1, 0, 0, 0	99.0	80.0	19.0	0.192	none	0.0	0.0	-19.0	33.0
ineligible		1, 1, 1, 0, 0, 0	149.0	120.0	29.0	0.195	none	0.0	0.0	-29.0	66.0
ineligible		0, 0, 0, 1, 0, 0	32.0	40.0	-8.0	-0.250	none	0.0	0.0	8.0	0.0
ineligible		0, 1, 0, 1, 0, 0	67.0	80.0	-13.0	-0.194	none	0.0	0.0	13.0	0.0
ineligible		1, 1, 0, 1, 0, 0	150.0	120.0	30.0	0.200	none	0.0	0.0	-30.0	66.0
ineligible		0, 0, 1, 1, 0, 0	63.0	80.0	-17.0	-0.270	none	0.0	0.0	17.0	0.0
ineligible		1, 0, 1, 1, 0, 0	113.0	120.0	-7.0	-0.062	none	0.0	0.0	7.0	33.0
ineligible		0, 1, 1, 1, 0, 0	131.0	120.0	11.0	0.084	none	0.0	0.0	-11.0	33.0
ineligible		1, 1, 1, 1, 0, 0	214.0	160.0	54.0	0.252	none	0.0	0.0	-54.0	99.0
ineligible		0, 0, 0, 0, 1, 0	25.0	40.0	-15.0	-0.600	none	0.0	0.0	15.0	0.0
ineligible		1, 0, 0, 0, 1, 0	42.0	80.0	-38.0	-0.905	none	0.0	0.0	38.0	0.0
ineligible		0, 1, 0, 0, 1, 0	93.0	80.0	13.0	0.140	none	0.0	0.0	-13.0	33.0
ineligible		1, 1, 0, 0, 1, 0	143.0	120.0	23.0	0.161	none	0.0	0.0	-23.0	66.0
ineligible		0, 0, 1, 0, 1, 0	56.0	80.0	-24.0	-0.429	none	0.0	0.0	24.0	0.0

This screen lists all possible bids together with the package of items you earned highlighted in red. For each package the screen shows its value along with the cost and profit at the end of auction prices; this bidder earned items A and D at a final cost of 80. By listing all possible bids, you can look to see if might have missed out on a more

profitable package. For instance, this bidder can see her potential profit on the package with items A and B only (*E points to this*) or on the package with items ABCD if she had instead kept four units of eligibility (*E points to this*). This might be helpful in determining what to do in future auctions. However, keep in mind that there is no guarantee that if you had bid differently you would have won an alternate package at these same prices, but it does give you some idea what might have been more a more favorable/profitable outcome. Note, you can use your various sort options with this screen. You will lose the highlighting for the package earned but you should be able to keep track of it since it's the only one with "set" next to it and a check in the box next to that.

If you are in the last group that finished your screen will look like this: This screen shows the winning bids for all bidders in your auction, along with the value of the package each bidder earned, its cost and that bidder's profits. Your outcome is highlighted in red. (*E points to this.*) Your profit or loss from this auction is automatically displayed in the upper right hand corner of your screens and your cash balance is updated as well. *(E points to these as reads script.)* Note that this auction had three bidders. All three got items. (E g*oes through the first two lines below pointing out that 1st guy got B and C with a value of 105, cost of 70 and profit of 35; 2nd guy got E and F with value of 91, cost of 65 and profit of 26; 3rd guy got A and D with value of 82, cost of 65 and profit of 17.)*

If you finished early, once the last group finishes you can see this same information for you group by clicking on the space Previous period results (*E points to this*). If you are the last group to finish, you can see a screen like the one before this one – by clicking on the space Analytics (*E points to this and shows screen before this*). So you'll get to see the same information as those who finished early.

We'll give you a little while to look at these screens at the end of the auction. You can flip back and forth between them by clicking on Analytics and Previous period results.

OK we are going top have some more dry runs. Remember your values are likely to have changed and the subjects assigned to bid in your auction have been determined randomly once again. As before there will be 3 bidders in your auction.