

## Experiment Instructions

*Overview:* This is an experiment in the economics of decision-making. Various foundations have provided funds for this research. The instructions are simple, and if you follow them carefully and make good decisions, you may earn a considerable amount of money that will be paid to you in CASH at the end of the experiment. Your earnings will be determined partly by your decisions and partly by the decisions of others.

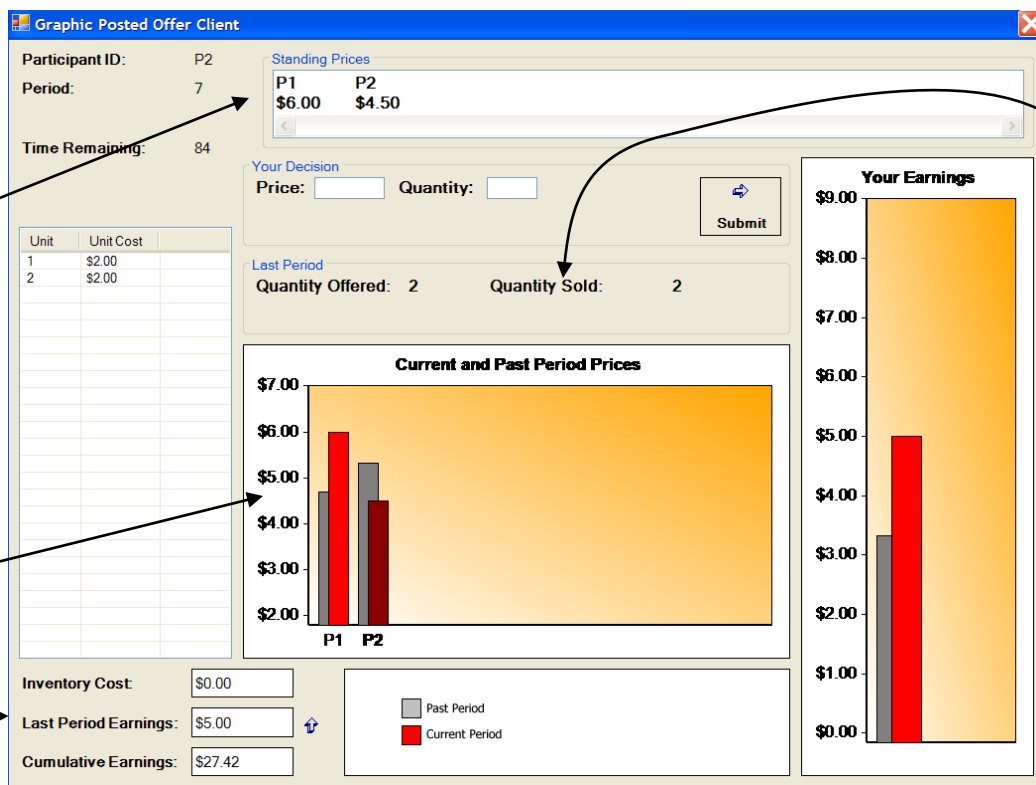
### *General Description.*

The experiment consists of a market in which you run a firm that produces and sells a certain product.

1. Besides you there is *one* other firm in your market. The other firm sells an identical product. Thus, five separate markets are taking place at once.
2. Markets are divided into *trading periods*. Each period you and the other seller in your market will be given units to offer for sale. Trading periods will last a maximum of 90 seconds.
3. Your task each period is to decide the price of your product, and the number of units to offer
4. You earn profits by selling at prices above costs. All firms produce units at a cost of 2 lab dollars each.
5. You may offer either 1 or 2 units per period. Production is *to demand*, in the sense that you pay production costs only for those units that subsequently sell. Thus, if you offer 2 units and sell just 1 unit, you will only pay the production cost for the first unit.
6. Your price can be no lower than your \$2 unit cost. You may post as high a price as you like.
7. Each trading period follows a simple two-step process. First sellers submit price and quantity decisions. Second, the automated buyer makes purchases, and your sales and earnings are calculated for you.
8. The buying rule. Each period an automated buyer purchases the lowest priced units first. In the case that both sellers offer the same price, the buyer will split purchases as evenly as possible among the sellers. If the buyer purchases an odd number from sellers posting the same price, the seller for the last unit will be determined randomly. The automated buyer will use the following rule.
  - a. The buyer will purchase 0 units at prices above \$6.00 per unit.
  - b. The buyer will purchase up to 3 units at prices up to \$6.00 per unit.
  - c. The buyer will purchase up to 8 units at prices up to \$3.50 per unit.
9. Unit costs and the above purchasing rule will remain in effect throughout the session.
10. The market will consist of at least 40 periods. After period 40, a random stopping rule will be used to determine whether or not the market will include additional periods. For each period after period 40, the market will continue for an additional period with a probability of 90%. Although this procedure is automated, you can think of it as the experimenter rolling a 10 sided die at the conclusion of each period after 40. If any of the numbers 1, 2..., 9 come up, the market continues. If a 10 is rolled, the market will terminate.
11. Your laboratory earnings will be converted to U.S currency at a rate of 10 lab dollars = \$1 U.S.

*Specific Instructions.* Below is a sample screen for a seller P2 in at the start of a period 7. In period 7, seller P2 must enter a price decision in the 'Price' box and a quantity decision in the 'Quantity' box, given the unit costs. Seller P2 has 84 seconds left to make his or her choices and to submit them by clicking the Submit button.

Notice that the screen allows you to track changes from previous periods (here periods 6 and 5). The 'Standing Prices' box at the top of the screen reports that in the previous period seller P2 posted a price of \$4.50 and that seller P1 posted a price of \$6.00. The same information is presented on the 'Current and Past Period Prices' graph as dark (red) bars. Price decisions for the period prior to the one just completed (here period 5) are also presented. Thus, for example, you can see that in the period just completed (period 6) seller P1 raised his price relative to previous period 5, and P2 lowered her price.



As indicated by the entry aside the **Quantity Sold:** heading, seller P2 sold two units in the previous period and earned \$5.00, as reported in the 'Last Period Earnings' box in the lower left corner of the screen. The 'Cumulative Earnings' box at the bottom left corner of your screen indicates that cumulative (laboratory) earnings for the first 6 periods were (\$27.42).

Period Earnings are calculated for you using the following formula:

$$\begin{aligned}
 \text{Period Earnings} &= \text{Price} \times \text{units sold} - \text{Unit cost} \times \text{units sold} \\
 &= \$4.50 \times 2 - \$2.00 \times 2 \\
 &= \$5.00
 \end{aligned}$$

Earnings for periods 6 and 5 are also presented on Your Earnings graph as dark (red) and light (gray) bars, respectively.

*Final note:* Sellers in markets will proceed at their own pace. Due to the different speeds at which markets progress, markets will stop at different times. If your market finishes more quickly than others, please wait patiently until the other participants finish.

*Questionnaire:* It is important that everyone understand how the market works, and the consequences of their decisions. Prior to beginning today's market, we will do two things to ensure that everyone understands these issues. First, we ask each of you to complete the following short questionnaire. Once everyone has completed the questionnaire, we will go over the answers together. Second, we will play a 10 period practice version of this market. You will *NOT* be paid for you decisions in the practice market. Following the termination of the practice market, you will be matched with a different seller and the paid market will start.

### *Questions*

1) Calculate unit sales and earnings for sellers P1 and P2 if P1 posts a price of \$6.50 and offers 2 units and P2 posts a price of \$6.10 and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

2) Calculate unit sales and earnings for sellers P1 and P2 if P1 posts a price of \$6.00 and offers 2 units, and P2 posts a price of \$5.00 and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

3) Calculate unit sales and earnings for sellers P1 and P2 if P1 posts a price of \$5.00 and offers 2 units and P2 posts a price of \$4.00, and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

4) Suppose the postings in (3) again, except suppose that suppose the seller P1 offers only a single unit. Show how this affects sales and earnings below.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

5) Calculate unit sales and earnings for P1 and P2 if P1 posts a price of \$3.50 and offers 2 units and P2 posts a price of \$3.50, and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

6) Suppose P1 has just completed the decisions for period 38, what is the probability that the seller will make a decision for period 39?

Probability of period 39 \_\_\_\_\_

7) Suppose P1 has just completed the decisions for period 42, what is the probability that the seller will make a decision for period 43?

Probability of period 43 \_\_\_\_\_

## Experiment Instructions

*Overview:* This is an experiment in the economics of decision-making. Various foundations have provided funds for this research. The instructions are simple, and if you follow them carefully and make good decisions, you may earn a considerable amount of money that will be paid to you in CASH at the end of the experiment. Your earnings will be determined partly by your decisions and partly by the decisions of others.

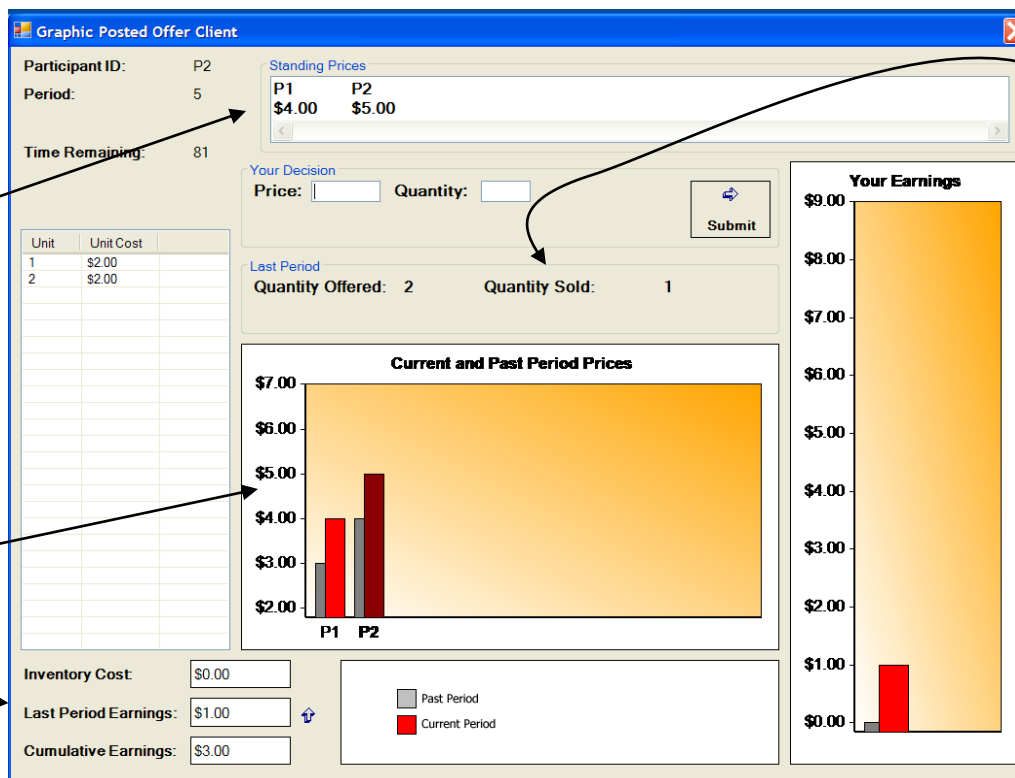
### *General Description.*

The experiment consists of a market in which you run a firm that produces and sells a certain product.

1. Besides you there is *one* other firm in your market. The other firm sells an identical product. Thus, five separate markets are taking place at once.
2. Markets are divided into *trading periods*. Each period you and the other seller in your market will be given units to offer for sale. Trading periods will last a maximum of 90 seconds.
3. Your task each period is to decide the price of your product, and the number of units to offer.
4. You earn profits by selling at prices above costs. All firms produce units at a cost of 2 lab dollars each.
5. You may offer either 1 or 2 units per period. Production is *in advance*, in the sense that you pay production costs regardless of whether or not these units subsequently sell. Thus, if you produce 2 units and sell just 1, you will still pay the production cost for both units.
6. Your price can be no lower than your \$2 unit cost. You may post as high a price as you like.
7. Each trading period follows a simple two-step process. First sellers submit price and quantity decisions. Second, the automated buyer makes purchases, and your sales and earnings are calculated for you.
8. The buying rule. Each period an automated buyer purchases the lowest priced units first. In the case that both sellers offer the same price, the buyer will split purchases as evenly as possible among the sellers. If the buyer purchases an odd number from sellers posting the same price, the seller for the last unit will be determined randomly. The automated buyer will use the following rule.
  - a. The buyer will purchase 0 units at any price above \$6.00 per unit
  - b. The buyer will purchase up to 3 units at prices up to \$6.00 per unit.
  - c. The buyer will purchase up to 8 units at prices up to \$3.50 per unit.
9. Unit costs and the above purchasing rule will remain in effect throughout the session.
10. The market will consist of at least 40 periods. After period 40, a random stopping rule will be used to determine whether or not the market will include additional periods. For each period after period 40, the market will continue for an additional period with a probability of 90%. Although this procedure is automated, you can think of it as the experimenter rolling a 10 sided die at the conclusion of each period after 40. If any of the numbers 1, 2..., 9 come up, the market continues. If a 10 is rolled, the market will terminate.
11. Your laboratory earnings will be converted to U.S currency at a rate of 10 lab dollars = \$1 U.S.

*Specific Instructions.* Below is a sample screen for a seller P2 in at the start of a period 5. In period 5, seller P2 must enter a price decision in the 'Price' box and a quantity decision in the 'Quantity' box, given the unit costs. Seller P2 has 81 seconds left to make his or her choices and to submit them by clicking the Submit button.

Notice that the screen allows you to track changes from previous periods (here periods 4 and 3). The 'Standing Prices' box at the top of the screen reports that in the previous period seller P2 posted a price of \$5.00 and that seller P1 posted a price of \$4.00. The same information is presented on the 'Current and Past Period Prices' graph as dark (red) bars. Price decisions for the period prior to the one just completed (here period 4) are also presented. Thus, for example, you can see that in the period just completed (period 3) both sellers P1 and P2 raised their prices relative to the previous period.



As indicated by the entry aside the **Quantity Sold:** heading, seller P2 offered two units in the previous period but sold just one. Seller P2 earned \$1.00 for the period, as reported in the 'Last Period Earnings' box in the lower left corner of the screen. The 'Cumulative Earnings' box at the bottom left corner of your screen indicates that cumulative (laboratory) earnings for the first 6 periods were (\$3.00).

Period earnings are calculated for you with the following formula:

$$\begin{aligned}
 \text{Period Earnings} &= \text{Price} \times \text{units sold} - \text{Unit cost} \times \text{units produced} \\
 &= \$5.00 \times 1 - \$2.00 \times 2 \\
 &= \$1.00
 \end{aligned}$$

Earnings for periods 4 and 3 are also presented on Your Earnings graph as dark (red) and light (gray) bars, respectively.

*Final note:* Markets will proceed at their own pace. Due to the different speeds at which markets progress, markets will stop at different times. If your market finishes more quickly than others, please wait patiently until the other participants finish.

*Questionnaire:* It is important that everyone understand how the market works, and the consequences of their decisions. Prior to beginning today's market, we will do two things to ensure that everyone understands these issues. First, we ask each of you to complete the following short questionnaire. Once everyone has completed the questionnaire, we will go over the answers together. Second, we will play a 10 period practice version of this market. You will *NOT* be paid for you decisions in the practice market. Following the termination of the practice market, you will be matched with a different seller and the paid market will start.

### *Questions*

1) Calculate unit sales and earnings for sellers P1 and P2 if P1 posts a price of \$6.50 and offers 2 units and P2 posts a price of \$6.10 and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

2) Calculate unit sales and earnings for sellers P1 and P2 if P1 posts a price of \$6.00 and offers 2 units, and P2 posts a price of \$5.00 and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

3) Calculate unit sales and earnings for sellers P1 and P2 if P1 posts a price of \$5.00 and offers 2 units and P2 posts a price of \$4.00, and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

4) Suppose the postings in (3) again, except suppose that suppose the seller P1 offers only a single unit. Show how this affects sales and earnings below.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

5) Calculate unit sales and earnings for P1 and P2 if P1 posts a price of \$3.50 and offers 2 units and P2 posts a price of \$3.50, and offers 2 units.

	Sales	Earnings
Seller P1	_____	_____
Seller P2	_____	_____

6) Suppose P1 has just completed the decisions for period 38, what is the probability that the seller will make a decision for period 39?

Probability of period 39 \_\_\_\_\_

7) Suppose P1 has just completed the decisions for period 42, what is the probability that the seller will make a decision for period 43?

Probability of period 43 \_\_\_\_\_



## Experiment Instructions

*Overview:* This is an experiment in the economics of decision-making. Various foundations have provided funds for this research. The instructions are simple, and if you follow them carefully and make good decisions, you may earn a considerable amount of money that will be paid to you in CASH at the end of the experiment. Your earnings will be determined partly by your decisions and partly by the decisions of others.

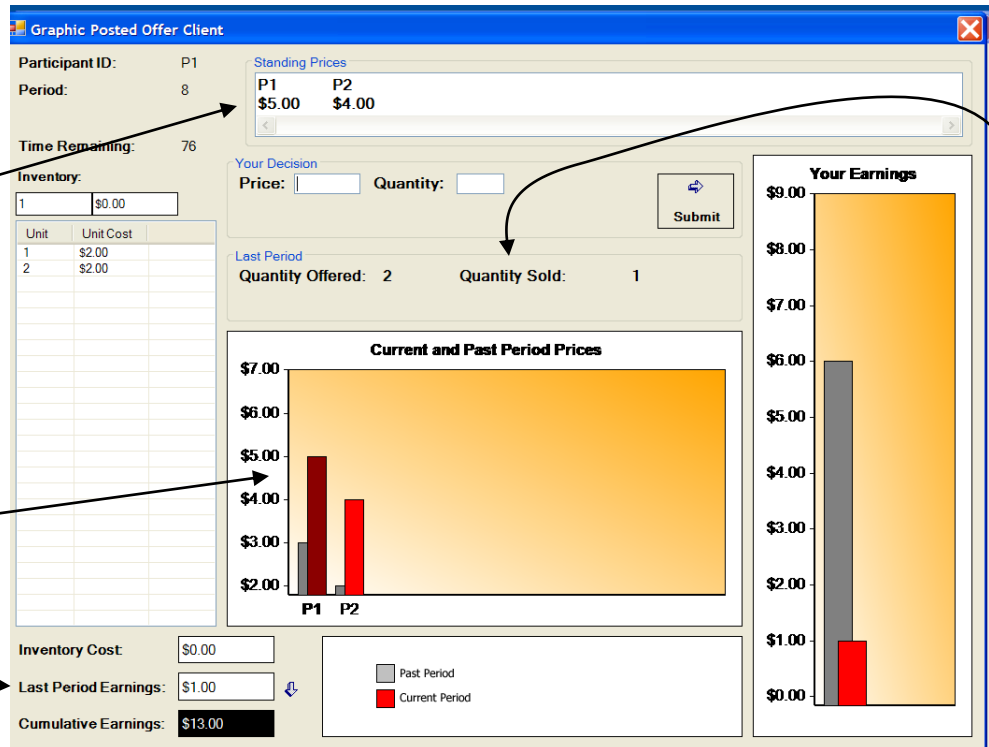
### *General Description.*

The experiment consists of a market in which you run a firm that produces and sells a certain product.

1. Besides you there is *one* other firm in your market. The other firm sells an identical product. Thus, five separate markets are taking place at once.
2. Markets are divided into *trading periods*. Each period you and the other seller in your market will be given units to offer for sale. Trading periods will last a maximum of 90 seconds.
3. Your task each period is to decide the price of your product, and the number of units to offer
4. You earn profits by selling at prices above costs. All firms produce units at a cost of 2 lab dollars each.
5. You may produce either 1 or 2 units per period. Production is *in advance*, in the sense that you pay production costs regardless of whether or not these units subsequently sell. Thus, if you produce 2 units and sell just 1, you will still pay the production cost for both units.
6. Any units produced in a period that are not sold will be carried forward as inventory. Units can be held in inventory for one period, after which they become worthless.
7. Each period you may at maximum offer all the units you can produce plus all the units in your inventory.
8. In any period your first units sold will be those in inventory, if there are any.
9. Your price can be no lower than the 2 lab dollar unit cost on newly produced units. You may post as high a price as you like.
10. Each trading period follows a simple two-step process. First sellers submit price and quantity decisions. Second, the automated buyer makes purchases, and your sales and earnings are calculated for you.
11. The buying rule. Each period an automated buyer purchases the lowest priced units first. In the case that both sellers offer the same price, the buyer will split purchases as evenly as possible among the sellers. If the buyer purchases an odd number from sellers posting the same price, the seller for the last unit will be determined randomly. The automated buyer will use the following rule.
  - a. The buyer will purchase 0 units at prices above \$6.00 per unit.
  - a. The buyer will purchase up to 3 units at prices up \$6.00 per unit.
  - b. The buyer will purchase up to 8 units at prices up to \$3.50 per unit.
12. Unit costs and the above purchasing rule will remain in effect throughout the session.
13. The market will consist of at least 40 periods. After period 40, a random stopping rule will be used to determine whether or not the market will include additional periods. For each period after period 40, the market will continue for an additional period with a probability of 90%. Although this procedure is automated, you can think of it as the experimenter rolling a 10 sided die at the conclusion of each period after 40. If any of the numbers 1, 2..., 9 come up, the market continues. If a 10 is rolled, the market will terminate.
14. Your laboratory earnings will be converted to U.S currency at a rate of 10 lab dollars = \$1 U.S.

*Specific Instructions.* Below is a sample screen for a seller P1 in at the start of a period 8. In period 8, seller P1 must enter a price decision in the ‘Price’ box and a quantity decision in the ‘Quantity’ box, given the unit costs. Seller P1 has 76 seconds left to make his or her choices and to submit them by clicking the Submit button.

Notice that the screen allows you to track changes from previous periods (here periods 7 and 6). The ‘Standing Prices’ box at the top of the screen reports that in the previous period seller P1 posted a price of \$5.00 and that seller P2 posted a price of \$4.00. The same information is presented on the ‘Current and Past Period Prices’ graph as dark (red) bars. Price decisions for the period prior to the one just completed (here period 7) are also presented. Thus, for example, you can see that in the period just completed (period 7) both sellers P1 and P2 raised their prices relative to the previous period (period 6).



As indicated by the entry aside the **Quantity Sold** heading, seller P1 offered two units in the previous period and sold just one. Seller P1 earned \$1.00 for the period, as reported in the ‘Last Period Earnings’ box in the lower left corner of the screen. The ‘Cumulative Earnings’ box at the bottom left corner of your screen indicates that cumulative (laboratory) earnings for the first 6 periods were \$13.00.

Period earnings are calculated for you with the following formula:

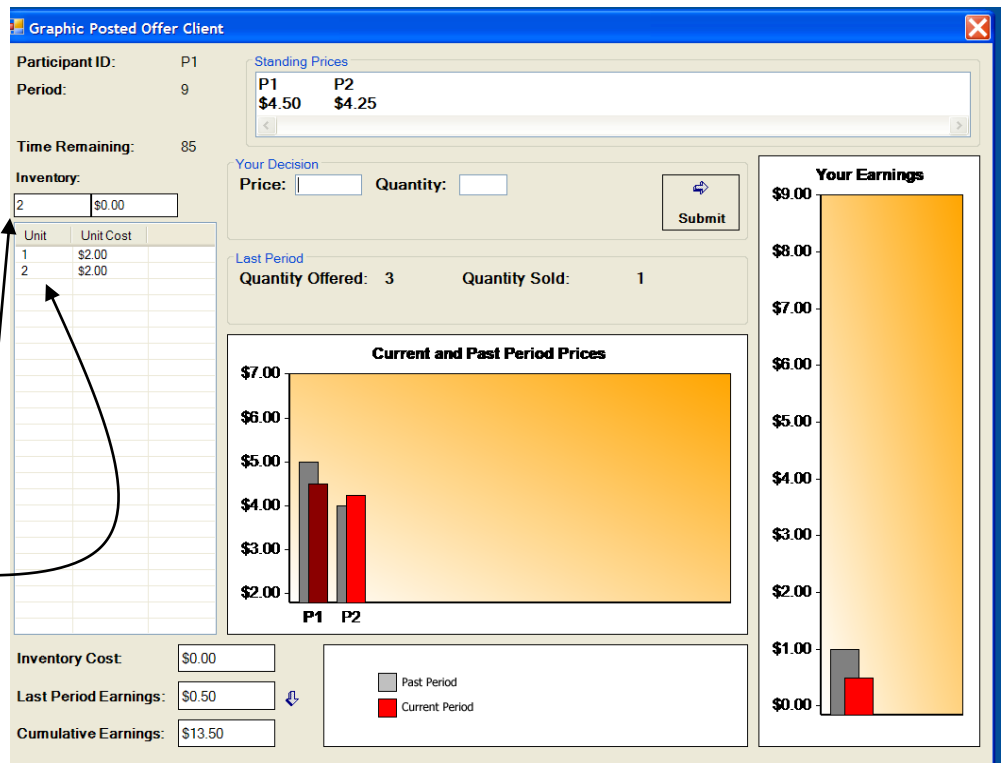
$$\begin{aligned}
 \text{Period Earnings} &= \text{Price} \times \text{units sold} - \text{Unit cost} \times \text{units produced} \\
 &= \$5.00 \times 1 - \$2.00 \times 2 \\
 &= \$1.00
 \end{aligned}$$

Earnings for periods 7 and 6 are also presented on the “Your Earnings” graph as dark (red) and light (gray) bars, respectively.

Notice also from the box below the **Inventory** heading that seller P1 carries one unit of inventory forward to the next period. Thus, in period 8, P1 may offer up to 3 units for sale, the one inventoried unit carried over from period 7 as well as two new units.

The panel below illustrates the possible consequences of offering 3 units in period 8. Here we assume that seller P1 posted a price of \$4.50 and seller P2 posted a price of \$4.25.

In this case, seller P1 sells only her inventoried unit, and earns  $\$4.50 - \$4 = \$0.50$  for the period, that is \$4.50 for the unit that sold, less \$4.00 for the two new units that seller P1 offered in the period. Notice also that in period 9 seller P1 carries an inventory of 2 units, and thus may offer a total of 4 units, two inventoried units plus two new units.



*Final notes:*

- Sellers can always be certain to sell their inventories. Sellers can always sell all the units they can both inventory and produce at a price of \$3.50
- Markets will proceed at their own paces. Due to the different speeds at which markets progress, markets may stop at different times. If your market finishes more quickly than others, please wait patiently until the other participants finish.

*Questionnaire:* It is important that everyone understand how the market works, and the consequences of their decisions. Prior to beginning today's market, we will do two things to ensure that everyone understands these issues. First, we ask each of you to complete the following short questionnaire. Once everyone has completed the questionnaire, we will go over the answers together. Second, we will play a 10 period practice version of this market. You will *NOT* be paid for you decisions in the practice market. Following the termination of the practice market, you will be matched with a different seller and the paid market will start.

### *Questions*

1) Calculate unit sales, earnings and inventories for sellers P1 and P2 if both sellers have initial inventories of 0, and if P1 posts a price of \$6.50 and offers 2 units and P2 posts a price of \$6.10 and offers 2 units.

	Sales	Earnings	Inventory
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

2) Calculate unit sales, earnings and inventories for sellers P1 and P2 if both sellers have initial inventories of 0, and if P1 posts a price of \$6.00 and offers 2 units, and P2 posts a price of \$5.00 and offers 2 units.

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

3) Calculate unit sales, earnings and inventories for sellers P1 and P2 if both sellers have initial inventories of 0, and if P1 posts a price of \$5.00 and offers 2 units and P2 posts a price of \$4.00, and offers 2 units.

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

4) Suppose the postings in (3) again, except suppose that suppose the seller P1 offers only a single unit. Show how this affects sales, earnings and inventories, below.

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

5) Suppose seller P1 has one unit of inventory and seller P2 has zero units of inventory. Calculate unit sales and earnings for P1 and P2 if P1 posts a price of \$5.00 and offers 3 units and P2 posts a price of \$4.00, and offers 2 units.

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

6) Consider again the situation in problem 5 (Seller P1 has one unit of inventory and seller P2 has two units of inventory), but suppose that seller P1 posts a price of \$4.00 and sellers P2 posts a price of \$5.00

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

7) Suppose now that Seller P1 has two units of inventory and seller P2 has zero units of inventory. Suppose that seller P1 offers four units at price of \$5.00 and seller P2 offers 2 units at a price of \$4.00. Calculate sales, earnings and inventories for sellers P1 and P2

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

8) Consider again the situation in (7) (that is, Seller P1 has two units of inventory and seller P2 has zero units of inventory). This time, however, suppose that seller P1 offers four units at price of \$4.00 and seller P2 offers 2 units at a price of \$5.00. Calculate sales, earnings and inventories for sellers P1 and P2

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

9) Consider once again the situation in which seller P1 has two units of inventory and P2 has zero units of inventory. This time, however, suppose that seller P1 offers four units at price of \$3.50 and seller P2 offers 2 units at a price of \$3.50. Calculate sales, earnings and inventories for sellers P1 and P2

	Sales	Earnings	Inventories
Seller P1	_____	_____	_____
Seller P2	_____	_____	_____

10) Suppose P1 has just completed the decisions for period 38, what is the probability that the seller will make a decision for period 39?

Probability of period 39 \_\_\_\_\_

11) Suppose P1 has just completed the decisions for period 42, what is the probability that the seller will make a decision for period 43?

Probability of period 43 \_\_\_\_\_