CIS 106

Problems – Using Nested if and Compound Relational Conditions

For each problem, develop the IPO and Code.

1. The input to the problem is the quantity of widgets. Your program should determine the price to charge based on the schedule below. Calculate the extended price (quantity x price). Calculate tax at 7%. Display the extended price, tax amount and total.

Quantity Price

>10000 $10

5000 to 10000 $20

Below 5000 $30

| Input | Process | Output |
| --- | --- | --- |
| Amount of Widgets (int) | Determine price per widget based on quantity | Extended Price (float) |
|  | If quantity is more than 10k price = $10 | Tax amount (float) |
|  | If amount is between 5k-10k price is $20 | Total amount (float) |
|  | If quantity is less than 5k price is $30 |  |
|  | Calc extended price |  |
|  | Extended price = quantity by price |  |
|  | Calc tax amount |  |
|  | Tax amount = extended price by 7% |  |
|  | Calc total amount |  |
|  | Total= extended price + tax amount |  |

1. Enter a part number and quantity Determine the cost per unit using the table below. Then calculate the total cost (quantity x unit cost). Display the part number, cost per unit and total cost. Note: Part number can be an integer but it can also be a string because you are not doing arithmetic on it. However in your code if statement be sure to compare using consistency, that is, if item == “10” when item is a string and if item == 10 when item is an integer.

Part Unit Cost

10 **or** 55 1.00

99 2.00

80 **or** 70 3.00

All others 5.00

| Input | Process | Output |
| --- | --- | --- |
| Part # (str / int) | Determine the cost per unit based on part # | Part # (str / int) |
| Amount of parts (int | If part # is “10” or “55” cost =$1.00 | Cost per unit (float) |
|  | If part # is “99” cost =$2.00 | Total Cost (float) |
|  | If part # is “80” or “70” cost =$3.00 |  |
|  | All other part # cost $5.00 |  |
|  | Calc Total Cost |  |
|  | Total cost = quantity by unit cost |  |

1. Enter a principle amount of a CD and year to maturity of CD. Determine the interest rate based on the amount of the principle **and** maturity (see below). Calculate first year interest (principle x interest rate). Display principle, interest rate and the interest amount for first year.

Principle Years to Maturity Interest Rate

>$100,000 5 6%

$50,000 to $100,000 10 5%

$50,000 to $100,000 5 4%

Any other principle and years 2%

| Input | Process | Output |
| --- | --- | --- |
| Principle amount (float) | Determine the interest rate based on the principle amount and years to maturity | Principle (float) |
| Years to maturity (int) | If principle > 100k and yrs to maturity is 5 the interest rate is 6% | Interest rate (float) |
|  | If principle is between 50k and 100k and yrs to maturity is 10 the interest rate is 5% | First year interest amount (float) |
|  | If principle is between 50k and 100k and yrs to maturity is 5 the interest rate is 4% |  |
|  | Any other principle and years to maturity combination the interest rate is 2% |  |
|  | Calc the first year interest |  |
|  | First year interest =principle by interest rate |  |

1. Allow the user to enter number of concert tickets. The price per ticket depends on the volume (see below). Display the number of tickets, price per ticket and the total cost (number of tickets x Price Per Ticket).

Quantity Price Per Ticket

>=25 $50

10 to 24 $60

5 to 9 $70

Less 5 $75

| Input | Process | Output |
| --- | --- | --- |
| # of tickets (int) | Determine the price per ticket based on # of tickets | # of tickets (int) |
|  | If # of tickets >=25 price is $50 | Price per ticket (float) |
|  | If # of tickets is between 10-24 price is $60 | Total Cost (float) |
|  | If # of tickets is between 5-9 price is $70 |  |
|  | If # of tickets is less than 5 price is $75 |  |
|  | Calc the total cost |  |
|  | Total cost = # of tickets by price per ticket |  |
|  |  |  |
|  |  |  |

1. The user will enter employee last name, salary and job level (as noted below). Use the job level to determine the bonus rate. Then compute bonus to be salary times bonus rate. Display employee last name and bonus.

Job Level Bonus Rate

10 and above 25%

5 to 9 20%

All others 10%

| Input | Process | Output |
| --- | --- | --- |
| Employee ln (str) | Determine the bonus rate based on job level | Employee ln (str) |
| Salary (float) | If Job Level is 10 and above the bonus rate is 25% | Bonus (float) |
| Job Level (int) | If job level is between 5-9 bonus rate is 20% |  |
|  | For all other job level bonus rate is 10% |  |
|  | Calc the bonus |  |
|  | Bonus = salary by bonus rate |  |
|  |  |  |
|  |  |  |
|  |  |  |