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 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:

- Quantity of widgets

Processing:

1. Determine the price per widget based on the quantity.
2. Calculate the extended price (quantity * price).
3. Calculate the tax amount (extended price * 0.07).
4. Calculate the total amount (extended price + tax).

Output:

- Extended price
- Tax amount
- Total amount

2. 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:

- Part number (can be a string or an integer)
- Quantity of parts

Processing:

1. Determine the unit cost based on the part number:
    - If part number is "10" or "55", unit cost = $1.00
    - If part number is "99", unit cost = $2.00
    - If part number is "80" or "70", unit cost = $3.00
    - All other part numbers, unit cost = $5.00
2. Calculate the total cost (quantity * unit cost).

Output:

- Part number
- Unit cost
- Total cost

3. 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:

- Principal amount of the CD
- Years to maturity of the CD

Processing:

1. Determine the interest rate based on the principal and years to maturity:
    - If principal > $100,000 and years to maturity is 5, interest rate = 6%
    - If $50,000 <= principal <= $100,000 and years to maturity is 10, interest rate = 5%
    - If $50,000 <= principal <= $100,000 and years to maturity is 5, interest rate = 4%
    - All other cases, interest rate = 2%

2. Calculate the first-year interest (principal * interest rate).
3. Convert the interest rate from a percentage to a decimal (i.e., 6% becomes 0.06).

Output:

- Principal amount
- Interest rate
- Interest amount for the first year

4. 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:

- Number of concert tickets

Processing:

1. Determine the price per ticket based on the number of tickets:
    - If number of tickets >= 25, price per ticket = $50
    - If 10 <= number of tickets <= 24, price per ticket = $60
    - If 5 <= number of tickets <= 9, price per ticket = $70
    - If number of tickets < 5, price per ticket = $75
2. Calculate the total cost (number of tickets * price per ticket).

Output:

- Number of tickets
- Price per ticket
- Total cost

5. 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:

- Employee last name
- Salary
- Job level

Processing:

1. Determine the bonus rate based on the job level:
    - If job level is 10 or above, bonus rate = 25%
    - If job level is between 5 and 9 (inclusive), bonus rate = 20%
    - All other job levels, bonus rate = 10%
2. Calculate the bonus (salary * bonus rate).
3. Convert the bonus rate from a percentage to a decimal (i.e., 25% becomes 0.25).

Output:

- Employee last name
- Bonus amount