

CIS 106 Introduction to Programming

Using the Basic If Statement

- Allow a user to enter a quantity of an item. If the quantity is greater than or equal to 1000, the unit price should be \$3.00. For quantities under 1000 the unit price is \$5.00. Compute extended price to be quantity x unit price. Compute tax to be 7% of the extended price. The total is computed as extended price plus the tax. Display the quantity, unit price, extended price, tax and total.

Input	Process	Output
qty	If qty >= 1000: Price = qty * 3.00 unit_p= 3.00 Else: Price = qty * 5.00 unit_p=5.00 Tax = price * .07 Total = price + tax	Qty Unit_p Price Tax total

- The program asks the user for an item and quantity. Determine the unit price of the item based on the chart below. Compute the extended price to be quantity x unit price. Display the item, unit price and extended price. Note: if the item entered is not A then assume the item is B. No need to check for B.

Item	Unit Price
A	\$10.00
B	\$20.00

(Note: assume the user will enter the data correctly. Assume if they enter capital A then \$10.00 gets assigned to unit price variable. Any other entry is assumed to be a capital B whether they enter B or not. Therefore, you only need a relational condition for A. This makes the if statement easier and removes data validation from the program which could get quite complex).

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if item == "A":
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    Unit_price = 10.00
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else:
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    Unit_price = 20.00
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Input	Process	Output
Item qty	if item == "A": Price_u = 10.00 else: price_u = 20.00 Price_e = qty * price_u	Item Price_u price_e

- Enter the number of books to order and cost per book. If the order total is over \$50.00 shipping is free. If the order total is \$50.00 or under charge \$25 shipping. Display the order total and shipping charge (note 0 should display for a free shipping charge).

Input	Process	Output
Qty cost	Total = qty * cost If total >= 50.00 Ship = 0 Else: Ship = 25	Total ship

- The warranty of an appliance depends on the cost of the appliance. For appliances over \$1,000 the warranty cost is 10% of the price. For appliances \$1,000 or less the warranty cost is 5% of the price. The user will enter the name and cost of an appliance. Display name and cost of appliance, the cost of the warranty and the total (cost of the appliance + warranty).

Input	Process	Output
Name cost	If cost > 1000 Cost_w = cost * 0.1 Else: Cost_w = cost * 0.05 Total = cost + cost_w	Name Cost Cost_w total

- Enter the user's last name, number of dependents and gross income. Compute adjusted gross income to be gross income minus dependents times \$12000. Next determine an income tax rate. Adjusted gross incomes over \$50,000 have a tax rate of 20%. Adjusted gross incomes \$50,000 or under have a tax rate of 10%.

Once you determine the tax rate, compute income tax to be adjusted gross * income times tax rate. If the income tax is less than 0, set the income tax to \$100.

Display last name, gross income, number of dependents, adjusted gross income, and income tax.

Note from student: This problem doesn't clearly define the steps in sentence two. It is unclear whether we are to subtract the dependents from the gross income and then multiply it by 12000 {i.e. $(\text{gross} - \text{dep_num}) * 12000$ } or if we are to simply allow the order or operations to multiply and then subtract {i.e. $\text{gross} - \text{dep_num} * 12000$ }. For this reason I have chosen to follow the most direct route of doing it the second way. I hope I have made my position clear and will not get points taken off. Additionally, this problem should be fixed for future classes.

Input	Process	Output
Name_l Dep_num gross	$\text{Gross_adj} = \text{gross} - \text{dep_num} * 12000$ If $\text{gross_adj} > 50000$: $\text{Tax_r} = 0.2$ Else: $\text{Tax_r} = 0.1$ $\text{Tax_i} = \text{gross_adj} * \text{tax_r}$ If $\text{tax_i} < 0$: $\text{Tax_i} = 100$	Name_l Gross Dep_num Gross_adj tax_i

Example Programs - You do not have to do these problems.

- Input a student's last name and GPA, display the last name, GPA and a message of "Well Done" when the GPA is greater than or equal to 4.0. When the GPA is less than 4.0 display a message "Good Effort".
- Allow a user to enter the meal cost. For meals over \$25 compute a tip to be 20% of the meal. For meals \$25 or under, give a \$3.00 tip. Compute the total to be cost of meal plus the tip. Display the meal cost, tip and total.

- The user enters the type of gasoline of either “regular” or “premium”. The user will also enter the gallons of gas purchased. Premium gas costs \$2.75 and regular costs \$2.25 per gallon. Compute the total to be gallons purchased times cost per gallon. Display type of gas, gallons purchased, cost per gallon and total.
- Allow a user to enter the base, height and hypotenuse of a triangle. Display a message, “Is a Right Angle” when the hypotenuse is equal to the square root of the sum of the squares of the base and height. Display “not a Right Angle” if this is not the case.
- Allow the user to enter two numbers. If the first number is greater than the second number display a message “Is Greater” otherwise display a message “Is Not Greater”.