Selection Structures PRACTICE

1. A store sells widgets at 25 cents each for small orders or at 20 cents each for orders of 100 or more. Write a program that requests the number of widgets ordered and displays the total cost. The program should incorporate functions as appropriate.

Sample runs (user input in bold):

Enter number of widgets: **75**

Cost for 75 widgets is $18.75

Enter number of widgets: **200**

Cost for 200 widgets is $40.00

1. Federal law requires that hourly employees be paid “time-and-a-half” for work in excel of 40 hours in a week. For example, if a person’s hourly rate is $12 and he/she works 60 hours in a week, the person’s gross pay should be:

(40 \* 12) + (1.5 \* 12 \* (60-40)) = $840   
Write a program that requests the number of hours a person works in a given week and the person’s hourly rate as input, and then display the person’s gross pay. The program should incorporate functions(s) as appropriate.

Sample runs (user input in bold):

Enter hourly rate: **12.50**

Enter number of hours worked: **47.5**

Gross pay for week is $640.62

Enter hourly rate: **13.75**

Enter number of hours worked: **25**

Gross pay for week is $343.75

1. Write a program to determine how much to tip the server in a restaurant. The tip should be 15% of the check, with a minimum of $2.

Sample runs (user input in bold):

Enter amount of bill: **5.75**

Tip is: $2.00

Enter amount of bill: **25.98**

Tip is: $3.90

1. Write a program to process a savings-account withdrawal. The program should request the current balance and the amount of the withdrawal as input and then display the new balance. If the withdrawal is greater than the original balance, the program should display “Withdrawal denied.” If the new balance is less than $150, the message ‘Balance below $150’ should be displayed.

Sample runs (user input in bold):

Enter current balance: **500**

Enter amount of withdrawal: **492.50**

The new balance is $7.50

Balance below $150

Enter current balance: **200**

Enter amount of withdrawal: **25.25**

The new balance is $174.75

Enter current balance: **10.50**

Enter amount of withdrawal: **15.25**

Withdrawal denied

1. In 2014 China’s population was about 1.37 billion and growing at the rate of .51% per year. In 2014 India’s population was about 1.26 billion and growing at the rate of 1.35% per year. Determine when India’s population will surpass China’s population. Assume that the 2014 growth rates will continue.

Sample run:

India's population will exceed China's population in the year 2025

1. Newton’s Law of Cooling states that when a hot liquid is placed in a cool room, each minute the decrease in the temperature is approximately proportional to the difference between the liquid’s temperature and the room’s temperature. That is, there is a constant *k* such that each minute the temperature loss is *k* \* (liquid’s temperature – room’s temperature). Suppose a cup of 212 degrees F coffee is placed in a 70 degrees F room and that *k* = .079. Determine the number of minutes required for the coffee to cool to below 150 degrees F.

Sample run:

The coffee will cool to below 150 degrees in 7 minutes.