University of Mauritius
Faculty of Engineering
Department of Computer Science & Eng.

CSE 1017Y –Computer Programming
2015/2016- Semester 1

Labsheet 3- Decision Structures

1. Write a program that allows the user to input the radius of a circle, and it calculates and displays the area. The program should only accept non-zero positive values for the radius and display an error message if the user tries to input a zero or negative value.

2. Write a program that asks the user his/her year of birth and calculates his/her age. If he/she is below 18 years old, the program must display "You are a child aged <*age*>!". Otherwise, it must display "You are an adult aged *age* years old!". (Assume that the age is calculated based on the year only)

   Sample input:

   Input your year of Birth: 2000

   Output:

   You are a child aged 14

   Sample input:

   Input your year of Birth: 1994

   Output:

   You are an adult aged 20

3. A factory pays its workers at the rate of Rs 100 per hour if the number of hours worked (per week) does not exceed 40. Otherwise, the hourly rate is Rs 150 for any hour worked above 40 in a given week. Write a program that allows the input of number of hours worked in a week and calculates and displays the wages for that week.

   Sample Input:

   Input no. of hours worked: 35

   Output:

   Total wages for the week: Rs 3500

Sample Input:
Input no. of hours worked: 45
Output:
Total wages for the week: Rs 4750

4. A baby-sitter charges Rs 250 an hour until 21:00 hrs. when the rate drops to Rs 175 an hour (the children are in bed). Write a program that accepts a starting time and ending time in hours and calculates the total baby-sitting bill. You can assume that the baby-sitter leaves at latest by 23: hrs. (Note: Consider full hours only).

   Sample Input:
   Please input the time of entry: **16**
   Please input the time of leaving: **20**

   Output:
   Bill: Rs 1000

   Sample Input:
   Please input the time of entry: **16**
   Please input the time of leaving: **23**

   Out:
   Bill: Rs 1350

5. Write a program that allows the input of two numbers and tells the user which of the two numbers is larger.
   Note: Assume that the two numbers entered are not equal.

6. Write a program that allows the coefficients **a**,**b** and **c** of a quadratic equation of the form $ax^2 + bx + c=0$ and it displays the roots of the equation, whether the roots are real or complex.

7. Write a program that reads an integer value, *num*, and determines if it is a perfect square. If it is a perfect square, then the program displays a message saying that *num* is a perfect square.
   Note: A perfect square is a number whose square root is an integer, e.g. 4 and 25 are perfect squares while 3 and 8 are not.

8. A lecturer gives 5-point quizzes that are graded as follows: 5 – A, 4 – B, 3 – C, 2 – D, 1 – E, 0 – F.
   Write a program that accepts a quiz score as input and uses a decision structure to display the above grades.

9. At a University, 100-point exams are graded as follows:

Marks	**Grade**
70 – 100	A
60 – 69	B
50 – 59	C
40 – 49	D
< 40	F

   Write a program that accepts an exam score as input and uses a decision structure to find the corresponding grade. Display suitable messages if the marks do not lie in the range 0 - 100.

10. A speeding ticket fine policy is Rs 500 plus Rs 10 for each km/hr over the speed limit of 90 km/hr.
    Write a program that accepts speed in km/hr as input, and displays a message indicating that the speed limit has not been exceeded or prints the amount of the fine that has to be paid. Also, speed should be in the range of 0 – 300 km/hr. All speeds outside this range should be rejected as invalid and a suitable message is to be displayed.