University of Mauritius
Faculty of Engineering
Department of Computer Science and Engineering
CSE 1003 – Computer Programming
2010/2011- Semester 2

Labsheet 4 – Decision Structures

Question 1
Using the **Python interpreter in an interactive mode**, execute the following Boolean expressions:

a. 3 > 4
b. 3 < 4
c. 3*4 < 3 + 4
d. "hello" > "Hello"
e. "hello" != "Hello"
f. "Bbbb" < "aaaa"

Question 2
Write a program that asks a user the radius of a circle, and 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.

Question 3
Write a program that asks the user their year or birth and calculates their age, *age*. If they are below 18 years old, the program must display "You are a child aged *age* years old!". Otherwise, it must display "You are an adult aged *age* years old!"

Question 4
A factory pays its workers at the rate of Rs 30 per hour if the number of hours worked (per week) does not exceed 40. Otherwise, the hourly rate is Rs 50 for any hour worked above 40 in a given week. Write a program that calculates the weekly wages from number of hours worked per week.

Question 5
A baby-sitter charges Rs 250 an hour until 9:00 p.m. 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.

Question 6

(a) 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.*

(b) Modify the program in part (a) so that given a number, num, it displays whether num is a perfect square or not.
   - *Example: If num = 4, it displays "4 is a perfect square." and if num = 8, it displays "8 is not a perfect square."*

Question 7
Write a program that reads two numbers and tells the user which of the two numbers is larger.
Note: Assume that the two numbers entered are not equal.

Question 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.

Question 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 entered are not numeric or do not lie within the range 0 - 100.

Question 10
A speeding ticket fine policy is Rs 500 plus Rs 10 for each km/hr over the speed limit of 110 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.