National University of Computer and Emerging Sciences (FAST-NU) Islamabad Campus
CL118 – Programming Fundamentals Spring 2019
Lab # 2: Variables and Expressions
Name: _____ Roll No.: _____

Exercise

Problem 1: Comparison Operators

C++ supports six comparison operators >, < , >=, <=, != and ==. Comparison operators always use two operands and give result in Boolean Form (True or False/ 0 or 1).

Program Text:

```
7==8
7!=10
-2 > 3
-2 < 3
-2 >= -2
 3 <= 4
```

Output:

```
False
True
False
True
True
True
```

Evaluate the following expressions:

a)7* (1==2)
b) 7* (1==1)
c) (3!=4) % (5+3)
d) 3 / ((-2 >= -2) == (3 <= 4))

Problem 2: A car holds 12 gallons of gasoline and can travel 350 miles before refueling. Write a program that calculates the number of miles per gallon the car gets. Display the result on the screen.
Hint: Use the following formula to calculate miles per gallon (MPG):
MPG = Miles Driven / Gallons of Gas Used
Note: Carefully choose the data types to hold data. Which should be int (if any) and which should be float (if any)?

Problem 3: Write a program that inputs a number consisting of five digits from the user separates the number into its individual digits and prints the digits separated from one another by three spaces each. [Hint: You will only need division '/' and '%' operators].

Problem 4: Write a program that inputs a six-digit number from the user, reverses it. [Hint: You will only need division '/' and '%' operators].

Name: _____ Roll No.: _____

Problem 5: Write a program that asks for the user's for their year of birth and current year to compute their age. Print out their age in the following format:

Your age is 25.

Problem 6: Write a program that asks for the user's to enter time in seconds and convert it to minutes and seconds. Print out time in the following format:

160 secs = 2 mins 40 secs

Problem 7: Write a program that converts an integer 5 to its binary form. Print out binary in the following format:

5 to base 10 = 101 to base 2

Problem 8: Write a program that takes a number as input and calculate its square root (You can't use any built-in function). Print result in the following format:

Square root of 4 = 2

(Hint: You can use ** operator)

Problem 9: Strings

In this part of the exercise, you will explore string operators as discussed in class. Now write a series of print statements to print out a greeting box and a goodbye message that can be sent as a text.

Declare the following strings:

```
name = 'Olivier Mugisha'
greeting = 'Happy Birthday'
goodbye = 'Goodbye, all!'
space = ' '
star = '*'
```

You are required to print the following greeting box by using only above mentioned strings:

```
******************************
** Happy Birthday Olivier Mugisha **
**********Goodbye, all! **********
******************************
```