Programming in Python (CSE 3142)

MINOR ASSIGNMENT-1: BASIC ELEMENTS OF PYTHON PROGRAMMING

1. Evaluate the following expressions:
   (x<y) or (not(z==y) and (z<x))
   a. x =0, y=6, z=10
   b. x=1, y=1, z=1

2. Evaluate the following expressions involving arithmetic operators:
   a. -7*20+8/16*2+54
   b. 7**2//9%3
   c. (7-4*2)*10-25*8//5
   d. 5%10+10-25*8//5
   e. 'hello'*2-5

3. Evaluate the following expressions involving relational and logical operators:
   a. 'hi' > 'hello' and 'bye' < 'Bye'
   b. 'hi' > 'hello' or 'bye' < 'Bye'
   c. 7 > 8 or 5 < 6 and 'I am fine > 'I am not fine'
   d. 10 !=9 and 29 >= 29
   e. 10 !=9 and 29 >= 29 and 'hi' > 'hello' or 'bye' < 'Bye' and 7 <= 2.5

4. Evaluate the following expressions involving arithmetic, relational and logical operators:
   a. 5 % 10 + 10 < 50 and 29 >= 29
   b. 7 ** 2 <= 5 // 9 % 3 or 'bye' < 'Bye'
   c. 5 % 10 < 8 and -25 > 1 * 8 // 5
   d. 7 ** 2 // 4 + 5 > 8 or 5 != 6
   e. 7/4 < 6 and 'I am fine > 'I am not fine'
   f. 10 + 6 * 2 ** 2 != 9//4-3 and 29 >= 29/9
   g. 'hello' * 5 > 'hello' or 'bye' < 'Bye'

5. Evaluate the following expressions involving bitwise operators:
   a. 15 & 22
   b. 15 | 22
   c. -15 & 22
   d. -15 | 22
   e. ~ 15
   f. ~ 22
   g. ~ -20
   h. 15^22
   i. $8 << 3$
   j. $40 >> 3$

6. Differentiate between the following operators with the help of examples:
   a. = and ==
   b. / and %
   c. / and //
   d. * and **

7. What output will be displayed when the following commands are executed in Python shell in sequence:
   a. >>> a = 6
      >>> a == 6
      >>> a < 5.9
      >>> a > 5.9
   b. >>> b = 7
      >>> b / 6
      >>> b // 6
      >>> b / 4
      >>> b % 4
      >>> b % 7
      >>> b * 2
      >>> b ** 2

8. Construct logical expressions for representing the following conditions:
   a. marks scored should be greater than 300 and less than 400.
   b. Whether the value of grade is an uppercase letter.
   c. The post is engineer and experience is more than four years.

9. Write Python statements for the following equations:
   a. root1= $\dfrac{-b+\sqrt{b^2-4ac}}{2a}$
   b. result= $\dfrac{2xy-9y}{2xy^3}-\dfrac{4yx^2}{2y}$
   c. result= $2\cos\frac{1}{2}(x+y)\cos\frac{1}{2}(x-y)+e^x-1-\frac{x}{4}+\tan x-\log(v)$

10. How does the effect of the following two statements differ?
    a. x += x + 10
    b. x = x+ 10

11. Write a program that asks the user to enter the width and length of a room. Once these values have been read, your program should compute and display the area of the room. The length and the width will be entered as floating-point numbers. Include units in your prompt and output message; either feet or meters, depending on which unit you are more comfortable working with.

12. An online retailer sells two products: widgets and gizmos. Each widget weighs 75 grams. Each gizmo weighs 112 grams. Write a program that reads the number of widgets and the number of gizmos from the user. Then your program should compute and display the total weight of the parts.

13. Write a program that determines how quickly an object is travelling when it hits the ground. The user will enter the height from which the object is dropped in meters (m). Because the object is dropped its initial speed is 0 m/s. Assume that the acceleration due to gravity is $9.8m/s^2$. You can use the formula $v_f=\sqrt{(v_i^2+2ad)}$ to compute the final speed, v_f, when the initial speed, v_i, acceleration, a, and distance, d, are known.

14. Write a program that reads a four-digit integer from the user and displays the sum of its digits. For example, if the user enters 3141 then your program should display $3+1+4+1=9$.

15. Write a program that reads three integers from the user and displays them in sorted order (from smallest to largest). Use the min and max functions to find the smallest and largest values. The middle

value can be found by computing the sum of all three values, and then subtracting the minimum value and the maximum value.

16. Create a program that reads duration from the user as a number of days, hours, minutes, and seconds. Compute and display the total number of seconds represented by this duration.