

Python for Computer Science and Data Science 1 (CSE 3651)

MINOR ASSIGNMENT-1: INTRODUCTION TO PYTHON PROGRAMMING AND BASICS

1. Which of the following statements is true about Python variables?
 - a. Variable names can start with a number.
 - b. Variables must be declared with their data types.
 - c. Python variables do not need to be declared before use.
 - d. Variable names can contain spaces.
2. As a follow-up of Q. 1., which of the following is a correct variable name in Python?
 - a. 1variable
 - b. variable_1
 - c. variable-1
 - d. variable 1
3. Mention 2 ways by which you can apply comments in Python.
4. What is the difference between the 'input()' function and the 'print()' function in Python?
5. How do you convert the string '123' to an integer in Python?
 - a. str('123')
 - b. int(123)
 - c. int('123')
 - d. float('123')
6. Differentiate between the following operators:
 - a. = and ==
 - b. / and %
 - c. / and //
 - d. * and **If there is no difference, then mention why, and if there is a difference, then justify with examples.
7. What is the output of the following Python code?

```
a=int(input("Enter a:"))
a=20
b=10
print(a+b)
```
8. What is the output of the following Python code?

```
a = "nana "
b = 8
c = a * b
print(c, "Batman")
```
9. How do you print the exact following lines in the exact order using only 1 print statement in Python?

```
Hi! We are studying "Python". \n I hope you all are doing well.
We are going to have a great time!
```
10. Create a program that displays your name and complete mailing address. The address should be printed in the format that is normally used in the area where you live. Your program does not need to read any input from the user.
11. Given an expression $P(x) = x^3 + 2x^2 + 3x + 4$, try to find the value of $P(2)$ pythonically.
12. Write a program that begins by reading a radius, r , from the user. The program will continue by computing and displaying the area of a circle with radius r and the volume of a sphere with radius r . Use the π constant in the math module in your calculations.
Hint: The area of a circle is computed using the formula $\text{area} = \pi r^2$.
The volume of a sphere is computed using the formula $\text{volume} = \frac{4}{3}\pi r^3$.

13. Write a program that reads a positive integer, n , from the user and then displays the sum of all of the integers from 1 to n . The sum of the first n positive integers can be computed using the formula:

$$sum = \frac{(n)(n+1)}{2}$$
14. Evaluate the following expressions:
 (a<b) or (not(c==b) and (c<a))
 a. a =10, b=5, c=0
 b. a=1.21, b=1.20, c=1.22
15. Assume you start investing in Mutual Funds with Rs. 1000 and plan to leave your money invested. Calculate and display how much money you will have after 10, 20 and 30 years. Use the following formula for determining these amounts:

$$a = p(1 + r)^n$$
 where p (principal) = Rs. 1000,
 r (annual rate of return) = 12
 n (number of years) = 10, 20, 30,
 a (amount on deposit at the end of the nth year).
 Disclaimer: Investing in Mutual Funds is subject to Market Risks. Do your due diligence before investing.
16. Import relevant Python modules and print the values of e^π and π^e . Then, if $e^\pi > \pi^e$, print "ok". Otherwise print "ok anyway".
17. 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. $5\%10+10-25*8//5$
18. 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 $7 <= 2.5$
 f. $5 \% 10 + 10 < 50$ and $29 >= 29$
 g. $7 ** 2 <= 5 // 9 \% 3$ or 'bye' < 'Bye'
 h. $5 \% 10 < 8$ and $-25 > 1 * 8 // 5$
 i. $7 ** 2 // 4 + 5 > 8$ or $5 != 6$
 j. $7/4 < 6$ and 'I am fine' > 'I am not fine'
 k. $10 + 6 * 2 ** 2 != 9//4-3$ and $29 >= 29/9$
 l. 'hello' * 5 > 'hello' or 'bye' < 'Bye'
19. The program that you create for this exercise will begin by reading the cost of a meal ordered at a restaurant from the user. Then your program will compute the tax and tip for the meal. Use your local tax rate when computing the amount of tax owing. Compute the tip as 18 percent of the meal amount (without the tax). The output from your program should include the tax amount, the tip amount, and the grand total for the meal including both the tax and the tip. Format the output so that all of the values are displayed using two decimal places.
20. Create a program that reads two integers, a and b, from the user. Your program should compute and display:

- The sum of a and b
- The difference when b is subtracted from a
- The product of a and b
- The quotient when a is divided by b
- The remainder when a is divided by b
- The result of $\log_{10} a$
- The result of ab

Hint: You will probably find the \log_{10} function in the math module helpful for computing the second last item in the list.

21. 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.
22. Write a program that begins by reading a temperature from the user in degrees Celsius. Then your program should display the equivalent temperature in degrees Fahrenheit and degrees Kelvin. The calculations needed to convert between different units of temperature can be found on the Internet.
23. 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 $3 + 1 + 4 + 1 = 9$.
24. 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.
25. 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.