Assignment 1:

Data Types and Variables:

1. Declare an integer variable x with the value 5. Print the value of x.
2. Create a floating-point variable y with the value 3.14. Print the value of y.

Typecasting:

3. Convert the string "123" to an integer and store it in a variable num.
4. Convert the integer 42 to a string and store it in a variable str_num.

Logical Operators:

5. Write a Python program that checks if a number entered by the user is both positive and even using the and operator.
6. Create a Python program that checks if a character entered by the user is either an uppercase letter or a digit using the or operator.
7. Write a Python program that checks if a user-entered string is not empty using the not operator.
8. Create a Python program that checks if a number entered by the user is divisible by either 3 or 5 but not both.
9. Write a Python program that checks if a student's score is between 0 and 100 (inclusive) using logical operators. If it is, print "Valid score," otherwise, print "Invalid score."
10. Create a Python program that asks the user for their age. If their age is between 18 and 65 (inclusive), print "You are eligible for work," otherwise, print "You are not eligible for work."

Assignment Operators:

11. Write a Python program that takes a number as input from the user and doubles it using the *= assignment operator. Print the result.
12. Write a Python program to swap the values of two variables x and y without using a temporary variable, using assignment operators.
13. Implement a Python program that keeps doubling a number x until it reaches or exceeds 100, using assignment operators.
14. Create a Python program that calculates and prints the average of three numbers entered by the user using the /= assignment operator.
15. Write a Python program that calculates and prints the square of a number entered by the user using the **= assignment operator.

Comparison Operators:

16. Create a Python program that compares the lengths of two strings entered by the user and prints whether they have the same length, different lengths, or if one is longer than the other.
17. Write a Python program that checks if a given year is a leap year or not, using comparison operators to check divisibility.

Arithmetic Operators:

18. Calculate the result of 7 divided by 2 and assign it to a variable result.
19. Calculate the remainder when 17 is divided by 5 and store it in a variable remainder.
20. Write a Python program that calculates the sum of all even numbers between 1 and 50 using arithmetic operators and loops.
21. Write a Python program that takes two numbers as input from the user and prints their sum.
22. Write a Python program that takes two numbers as input from the user, but with a twist. The program should only accept input if the sum of the two numbers is less than 100. If the sum is 100 or greater, the program should ask the user to re-enter both numbers until the sum is less than 100, and then it should print the sum. Using Loop
23. Write a program that calculates and prints the area of a rectangle given its length and width (inputs from the user).
24. Take two number inputs from user.
    1. Find out the square of the given two numbers and store the value in different two variables
    2. Find out the average of the numbers
    3. Find out the datatype of the average value
    4. Now find out the remainder of the Average value when the value is divided by 2
    5. Print the final outcome in Integer Format

6. Write a Python program that calculates and prints the square root of a given positive number. If the number is negative, print an error message.

Conceptual:

25. What is the result of 10 / 3 and 10//3 in Python, and why?
26. Explain the difference between = and == in Python