**Data Science with ML & AI**

**Topic – Python(Loop and Conditional Statements)**

**Assignment 2:-**

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Loops and Conditional Statements

1. How do `if-elif-else` statements work in Python? Provide an example where multiple conditions must be checked and explain the flow of control.

Coding Challenge:Write a function that takes a number as input and returns "Positive", "Negative", or "Zero" based on the input value.

2. What is the difference between `for` loops and `while` loops in terms of conditional checks? When would you prefer one over the other?

- Coding Challenge: Write a Python script to print all prime numbers between 1 and 100 using a `for` loop.

3. Explain how nested `if` statements work in Python. How can you avoid deep nesting to make your code more readable?

- Coding Challenge: Write a function that takes three numbers as input and returns the largest of the three using nested `if` statements.

4. What are the potential risks of using `break` in loops? How does it affect loop execution and what alternatives can you use?

- Coding Challenge: Write a Python program that reads numbers from the user until they input a negative number. The program should then print the sum of all positive numbers entered.

5. How does the `else` clause in a loop work, and how does it differ from the `else` in conditional statements?

- Coding Challenge: Write a function that searches for a specific element in a list using a `for` loop. If the element is found, return its index; if not, return -1 using the `else` clause in the loop.

6. What is a common pitfall when using floating-point numbers in conditional statements? How can you avoid it?

- Coding Challenge: Write a Python function that compares two floating-point numbers and returns `True` if they are approximately equal, considering a small tolerance value.

7. How can you combine `for` loops and `if` statements to filter and process data in Python?

- Coding Challenge: Given a list of integers, write a Python program that uses a `for` loop and `if` statements to create a new list containing only the even numbers.

8. Discuss the concept of short-circuit evaluation in Python. How does it affect the performance of conditional statements?

- Coding Challenge: Write a function that takes three boolean values and returns `True` if at least two of them are `True`, using short-circuit evaluation.

9. Explain how the `continue` statement works in a loop. What are some scenarios where using `continue` is more beneficial than restructuring the loop?

- Coding Challenge: Write a Python program that iterates through a list of numbers and prints only those numbers that are divisible by 3, using the `continue` statement.

10. How can you use list comprehensions in combination with conditional statements to make your code more concise?

- Coding Challenge: Write a list comprehension that generates a list of squares of all even numbers between 1 and 20.

**submit your assignment to the below link**

https://forms.gle/Grz51ZXvfHs2KcWv7