LAB MANUAL

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LAB 05

Python `for` and `while` Loops

1. **Basic Task:** Write a `for` loop to print the first 10 natural numbers.

```python
print("First 10 natural numbers:")

# Using a for loop to print the first 10 natural numbers
for i in range(1, 11):
    print(i)
```

Output:

```
First 10 natural numbers:
1
2
3
4
5
6
7
8
9
10
```

2. **Intermediate Task:** Write a `while` loop that prints numbers from 10 down to 1.

```
print("Numbers from 10 down to 1:")

# Using a while loop to print numbers from 10 down to 1
num = 10
while num >= 1:
    print(num)
    num -= 1  # Decrease num by 1 in each iteration
```

Output:

```
Numbers from 10 down to 1:
10
9
8
7
6
5
4
3
2
1
```

3. **Advanced Task:** Create a program that uses a `for` loop to iterate over a string and count the number of vowels.

```python
print("Program to count vowels in a string:")

# Taking the string input
string = input("Enter a string: ")

# Defining the vowels
vowels = "aeiouAEIOU"

# Initializing the counter for vowels
vowel_count = 0

# Using a for loop to iterate over each character in the string
for char in string:
    if char in vowels:  # Checking if the character is a vowel
        vowel_count += 1

# Printing the result
print(f"The number of vowels in the string is: {vowel_count}")
```

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Output:

```
Program to count vowels in a string:
Enter a string: The number of vowels in the string is: 2
```

4. **Challenge Task:** Write a program that prints the Fibonacci series up to n terms using a `while` loop.

```
print("Fibonacci series up to n terms:")

# Taking the number of terms (n) as input
n = int(input("Enter the number of terms: "))

# Initializing the first two terms of the Fibonacci series
a, b = 0, 1
count = 0

# Using a while loop to print the Fibonacci series
while count < n:
    print(a, end=" ")
    # Update values of a and b
    a, b = b, a + b
    count += 1
```

```
Fibonacci series up to n terms:
Enter the number of terms: 7
0 1 1 2 3 5 8
```