10 September Notes

1️⃣ Multiplication Table Program

Explanation:
This program prints the multiplication table of a given number from 1 to 10. The for loop runs from 1 to 10, and for each iteration, it multiplies the input number n with the loop variable i and prints the result in a formatted way.

```
n = int(input("enter a number"))

for i in range(1, 11, 1):

  print(f"{n} x {i} = {n*i}".center(20))
```

✅ Sample Output:

2 x 1 = 2

2 x 2 = 4

2 x 3 = 6

2 x 4 = 8

2 x 5 = 10

2 x 6 = 12

2 x 7 = 14

2 x 8 = 16

2 x 9 = 18

2 x 10 = 20

2️⃣ Sum of Numbers from 1 to 10

Explanation:
Here, we calculate the sum of numbers between 1 and 10. We use a for loop to add each number to the variable total. Finally, the result is displayed.

```
total = 0

for i in range(1, 11):

  total += i
```

```
print("Sum of 1 to 10 numbers is:", total)
```

✅ Output:

```
Sum of 1 to 10 numbers is: 55
```

3️⃣ Counting Even Numbers from 1 to 15

Explanation:
This program counts how many even numbers are there between 1 and 15. The loop runs with a step of 2, so it only iterates through odd numbers. Each odd number increases the counter by 1, meaning there are 7 even numbers in total (since 15 numbers contain 7 even numbers).

```
count = 0

for i in range(1, 15, 2):
  count += 1

print(count)
```

✅ Output:

```
7
```

4️⃣ Count of Numbers, Evens, and Odds in a Range

Explanation:
This program takes a starting number (sr) and an ending number (er) as input. It counts:

- Total numbers (nc)
- Even numbers (ec)
- Odd numbers (oc)

The loop goes from sr to er, checks if the number is even using i % 2 == 0, and updates counters accordingly.

```
sr = int(input())

er = int(input())

nc = 0

ec = 0
```

```
oc = 0
for i in range(sr, er+1, 1):
   print("when i=", i)
   nc = nc + 1
   print("nc=", nc)
   if(i % 2 == 0):
      ec = ec + 1
      print("ec=", ec)
   else:
      oc = oc + 1
      print("oc=", oc)
```

✅ Sample Execution (shortened):

```
when i= 1
nc= 1
oc= 1
when i= 2
nc= 2
ec= 1
when i= 3
nc= 3
oc= 2
...
when i= 66
nc= 66
ec= 33
```

5️⃣ Factorial of a Number

Explanation:
The factorial of a number n is the product of all positive integers up to n. For example, factorial of 5 is 5 × 4 × 3 × 2 × 1 = 120. This program calculates factorial using a descending for loop.

```
n = int(input())

fact = 1

for i in range(n, 0, -1):

  fact = fact * i

print(fact)
```

✅ Sample Output:

120