

## Control Structures

5-2-26

Aim – Use loops and mathematical concepts to produce a star pattern and factorial of entered number

Theory – It uses for loops in a fixed range to produce the desired output. The range function starts from 0 to the given number hence in the factorial program, we had to set the start to 1 as any number multiplied by zero is zero. In the star generation program, we used for loops to generate the empty spaces and the \*'s wherever required according to the pattern

A1.

$n = 5$

```
for i in range(n):
```

```
    for j in range(n - i - 1):
```

```
        print(' ', end="")
```

```
    for j in range(2 * i + 1):
```

```
        print('*', end="")
```

```
    print()
```

```
for i in range(n - 2, -1, -1):
```

```
    for j in range(n - i - 1):
```

```
        print(' ', end="")
```

```
    for j in range(2 * i + 1):
```

```
        print('*', end="")
```

```
    print()
```



A2.

```
count = input("Enter factorial number: ")
```

```
factorial = 1
```

```
for i in range(1, int(count) + 1):
    factorial = factorial * i
print("Factorial of " + str(count) + " is: " + str(factorial))
```

```
Enter factorial number: 5
Factorial of 5 is: 120
```

### Conclusion

It demonstrates the use of loops in python and how efficiently apply mathematical concepts and patterns in python.