1. **Insert a number in a array in specific position**

```
arr = [1, 2, 3, 4, 5]
index = 2
element = 100
for i in range(len(arr) - 1, index - 1, -1):
    arr[i] = arr[i - 1]
arr[index] = element
print(arr)
```

```
[1, 2, 100, 3, 4]
```

By deleting the index

```
arr = [1, 2, 3, 4, 5]
index = 2
element = 100
arr[index] = element
print(arr)
```

```
[1, 2, 100, 4, 5]
```

2. **Write a program to get the subsets of given input**

```
a=[1,2,3]
result=[[]]
for i in a:
    new_sub=[]
    for j in result:
        new_sub.append(j+[i])
    result.extend(new_sub)
print(result)
```

```
[[], [1], [2], [1, 2], [3], [1, 3], [2, 3], [1, 2, 3]]
```

3. **Write a program to find the sum of digits.**

```
num = 12345
num_str = str(num)
sum = 0
for char in num_str:
    sum += int(char)
print("The sum of the digits is:", sum)
```

```
The sum of the digits is: 15
```

4. **Write a program to find the length of a string**

```
num = "sai"
print(len(num))
```

```
3
```

5. **Write a program to generate the list of all factor for n value.**

```
n = 28
factors = []
for i in range(1, n + 1):
    if n % i == 0:
        factors.append(i)
print("The factors of", n, "are:", factors)
```

```
The factors of 28 are: [1, 2, 4, 7, 14, 28]
```

6. **Write a program for to multiply two Matrix**

```
A = [
    [1, 2],
```

```
    [1,1]]
B = [
    [1,2],
    [1,1]]
result = [[0, 0], [0, 0]]
for i in range(len(A)):
    for j in range(len(B)):
        for k in range(len(B)):
            result[i][j] += A[i][k] * B[k][j]
for row in result:
 print(row)
```

```
[3, 4]
[2, 3]
```

7. **Write a program for to add two Matrix**

```
A = [
    [1, 2, 3],
    [4, 5, 6]
]
B = [
    [7, 8, 9],
    [10, 11, 12]
]
result = [[0, 0, 0], [0, 0, 0]]
for i in range(len(A)):
    for j in range(len(B)):
        result[i][j] = A[i][j] + B[i][j]
for row in result:
    print(row)
```

```
[8, 10, 0]
[14, 16, 0]
```

8. **Write a program for pascal triangle**

```
n = 5
triangle = [[1]]
for i in range(1, n):
    row = [1]
    for j in range(1, i):
        row.append(triangle[i-1][j-1] + triangle[i-1][j])
    row.append(1)
    triangle.append(row)
for row in triangle:
    print(row)
```

```
[1]
[1, 1]
[1, 2, 1]
[1, 3, 3, 1]
[1, 4, 6, 4, 1]
```

9. **U are climbing a staircase. it takes n steps to reach top. each time u can either climb 1 and 2 steps. in how many distinct ways can you climb to top .**

```
n = 5
```

```
if n == 0:
    ways = 1
elif n == 1:
    ways = 1
else:
    prev1 = 1
    prev2 = 1
    for i in range(2, n + 1):
        current = prev1 + prev2
        prev1 = prev2
        prev2 = current
    ways = prev2
print(f"Number of distinct ways to climb {n} steps: {ways}")
```

```
Number of distinct ways to climb 5 steps: 8
```

10. **Write a program to get triangle**

```
n=5
for i in range(0,n+1,1):
    print(i*'*')
```

```
*
**
***
****
*****
```

inverted triangle

```
n=5
for i in range(n,0,-1):
    print(i*'*')
```

```
*****
****
***
**
*
```