```python
#1. Python program to transpose a matrix.

import numpy as np
matrix = np.array([[1,2,3],[4,5,6],[7,8,9]])

print('Matrix:')
print(matrix)
print('')
print('Transpose of the Matrix:')
print(matrix.T)
```

Output:

Matrix:

[[1 2 3]

[4 5 6]

[7 8 9]]

Transpose of the Matrix:

[[1 4 7]

[2 5 8]

[3 6 9]]

Process finished with exit code 0

```python
#2. Python program to multiply two matrices.

import numpy as np
matrix1 = np.array([[1,2,3],[4,5,6],[7,8,9]])
matrix2 = np.array([[1,2,3],[4,5,6],[7,8,9]])
matrix3 = np.dot(matrix1,matrix2)
print('Matrix1:')
print(matrix1)
print('')
print('Matrix2:')
print(matrix2)
print('')
print('Multiplication of the Matrix:')
print(matrix3)
```

Output:

Matrix1:

[[1 2 3]

[4 5 6]

[7 8 9]]

Matrix2:

[[1 2 3]

[4 5 6]

[7 8 9]]

Multiplication of the Matrix:

[[30 36 42]

[66 81 96]

[102 126 150]]

Process finished with exit code 0

```python
#3. Python program that generates prime numbers with the help of a function
to test prime or not.

num = int(input('Please enter your number: '))
def prime_check(num):
    flag = False

    # prime numbers are greater than 1
    if num > 1:
        # check for factors
        for i in range(2, num):
            if (num % i) == 0:
                # if factor is found, set flag to True
                flag = True
                # break out of loop
                break

    # check if flag is True
    if flag:
        print(num, "is not a prime number")
    else:
        print(num, "is a prime number")

prime_check(num)
```

Output:

Please enter your number: 3

3 is a prime number

Process finished with exit code 0

```
#4. Python Program to Return Multiple Values From a Function.

def demo():
 movie = "Top Gun"
 year = 1986
 actor = "Tom Cruise"
 return movie, year, actor
m, y, a = demo()
print(m)
print(y)
print(a)
```

Output:

Top Gun

1986

Tom Cruise

Process finished with exit code 0

```
#5. Python Program to Find All Numbers which are Odd and Palindromes Between
a Range of Numbers.
```

```
lower = int(input("Please enter lower limit: "))
upper = int(input("Please enter upper limit: "))
upperlim = upper + 1
print("Odd and Palindrome: ")
for i in range(lower, (upperlim)):
 if (((i % 2) == 1) and (str(i) == str(i)[::-1])):
    print(i)
 else:
    continue
```

Output:

Please enter lower limit: 5

Please enter upper limit: 200

Odd and Palindrome:

5

7

9

11

33

55

77

99

101

111

121

131

141

151

161

171

181

191

Process finished with exit code 0

```
#6. Python program to understand the use of arguments (i.e. positional
arguments, keyword arguments and default arguments).

def add(num1,num2):
 return (num1 + num2)
```

```
def mul(num1, num2 = 10):
 return (num1 * num2)
num3 = 10
num4 = 20
print(add(num3, num4))
print(add(num1 = num3, num2 = num4))
print(mul(num3))
```

Output:

30

30

100

Process finished with exit code 0

```
#7. Python program to show variable length argument and its uses.

def multiplication(*args):
 num = 1
 for i in args:
    num *= i
```

```
 print("Multiplication: ", num)
multiplication(2,3)
multiplication(2,3,4,5)
```

Output:

Multiplication: 6

Multiplication: 120

Process finished with exit code 0

```
#8. Python program to calculate factorial values using recursion.

def factorial(number1):
 if (number1 == 1):
    return 1
 else:
    return (number1 * factorial(number1-1))
```

```
number2 = int(input("Enter number: "))
print("Factorial: ", factorial(number2))
```

Output:

Enter number: 5

Factorial: 120

Process finished with exit code 0