```
 sem/crypto/lab1/12.primitiveroot.py"
Enter a prime number: 23
Primitive root of 23: 5
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
 sem/crypto/lab1/12.primitiveroot.py"
Enter a prime number: 8
Primitive root of 8: None
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
13.coprimeornot.py"
Enter first number: 99
Enter second number: 50
99 and 50 are co-prime.
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
13.coprimeornot.py"
Enter first number: 12
Enter second number: 18
12 and 18 are NOT co-prime.
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
14.DiffieHellman.py"
Alice's Public Key: 9
Bob's Public Key: 23
Shared Secret Key: 16
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
15.RSAalgorithm.py"
Enter message to encrypt: SUPREME
Cipher: [2680, 2310, 2933, 1859, 28, 3123, 28]
Decrypted: SUPREME
PS E:\College\SUPRIMBHATTARAI\5th sem\crypto\lab1>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
on/code/randomnumber.py"
Generated Random Numbers-Suprim Bhattarai :
Enter seed value (X0): 25
Enter multiplier (a): 13
Enter increment (c): 29
Enter modulus (m): 100
Enter number of random numbers to generate: 10

Generated Random Numbers:
X0 = 54
X1 = 31
X2 = 32
X3 = 45
X4 = 14
X5 = 11
X6 = 72
X7 = 65
X8 = 74
X9 = 91
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
on/code/7.pseudorandomnumber.py"
Enter seed value (X0): 21
Enter multiplier (a): 23
Enter modulus (m): 5
Enter number of random numbers to generate: 12
Generated Random Numbers - (Suprim Bhattarai):
X1 = 3
X2 = 4
X3 = 2
X4 = 1
X5 = 3
X6 = 4
X7 = 2
X8 = 1
X9 = 3
X10 = 4
X11 = 2
X12 = 1
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
on/code/8.midsquare.py"
Enter the seed value (n-digit number): 23
Enter how many random numbers you want to generate: 11
Random Numbers Generated SuprimBhattarai:
X0 = 52
X1 = 70
X2 = 90
X3 = 10
X4 = 10
X5 = 10
X6 = 10
X7 = 10
X8 = 10
X9 = 10
X10 = 10
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
on/code/9.kstest.py"
Enter the number of random numbers: 6
Enter 6 random numbers (between 0 and 1):
Enter number 1: 0.12
Enter number 2: 0.98
Enter number 3: 0.65
Enter number 4: 0.34
Enter number 5: 0.57
Enter number 6: 0.19

Sorted Random Numbers:
0.1200 0.1900 0.3400 0.5700 0.6500 0.9800

Table: SuprimBhattarai
------------------------------------------------------------
Ri        i/N       (i-1)/N   Fn(Ri)    D+        D-
------------------------------------------------------------
0.1200    1.0000    0.0000    0.1667    0.0467    0.1200
0.1900    2.0000    0.1667    0.3333    0.1433    0.0233
0.3400    3.0000    0.3333    0.5000    0.1600    0.0067
0.5700    4.0000    0.5000    0.6667    0.0967    0.0700
0.6500    5.0000    0.6667    0.8333    0.1833    -0.0167
0.9800    6.0000    0.8333    1.0000    0.0200    0.1467
------------------------------------------------------------
D+ = 0.183333
D- = 0.146667
D statistic (D) = 0.183333
Critical D value (D_alpha) = 0.555218

Conclusion:
Since D_statistic < D_alpha
Fail to reject H0: No significant difference detected. The sample follows a uniform distribution.
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code>
```

```
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code> & C:/Users/ACER/AppData/Local/Microsoft/WindowsApps/python3.11.exe
on/code/10.chisquaretest.py"
Enter the number of intervals: 3

Enter the interval ranges (start end) for each interval:
Interval 1 (start end): 0.12 0.34
Interval 2 (start end): 0.45 0.56
Interval 3 (start end): 0.78 0.97

Enter the observed frequencies for each interval:
Observed frequency for interval (0.12, 0.34): 4
Observed frequency for interval (0.45, 0.56): 5
Observed frequency for interval (0.78, 0.97): 2

Chi-Square Test Results SuprimBhattarai:

+--------------+----------------+----------------+----------------+
| Interval     |   Observed (O) |   Expected (E) |   (O - E)² / E |
+==============+================+================+================+
| (0.12, 0.34) |              4 |        3.66667 |       0.030303 |
+--------------+----------------+----------------+----------------+
| (0.45, 0.56) |              5 |        3.66667 |       0.484848 |
+--------------+----------------+----------------+----------------+
| (0.78, 0.97) |              2 |        3.66667 |       0.757576 |
+--------------+----------------+----------------+----------------+

Conclusion:
Calculated χ² = 1.2727
Critical χ² (α=0.05, df=2) = 5.9915
Since χ²_calculated ≤ χ²_critical, the null hypothesis is NOT rejected.
PS E:\College\SUPRIMBHATTARAI\5th sem\simulation\code>
```