1. Implement Euclid algorithm to find GCD.

   Test case:
           GCD(16,12) = 4
           GCD(12,4) = 0
   Then 4 is the GCD(16,12)

   PROGRAM:

   ```python
   def gcd(a, b):
       if b == 0:
           return a
       else:
           return gcd(b, a % b)

   n1, n2 = map(int, input('Enter 2 numbers:').split() )
   ans = gcd(n1, n2)
   print(ans)
   ```

   OUTPUT:

   ```
   C:\Users\parth\PycharmProjects\python1>python GCD.py
   Enter 2 numbers:16 12
   GCD: 4

   C:\Users\parth\PycharmProjects\python1>
   ```

   ```
   C:\Users\parth\PycharmProjects\python1>python GCD.py
   Enter 2 numbers:48 24
   GCD: 24

   C:\Users\parth\PycharmProjects\python1>
   ```

2. Implement Caesar cipher for Encryption and Decryption

Assign numerical equivalent to each letter :

a	b	c	d	e	f	g	h	i	j
0	1	2	3	4	5	6	7	8	9

k	l	m	n	o	p	q	r	s	t
10	11	12	13	14	15	16	17	18	19

u	v	w	x	y	z
20	21	22	23	24	25

$c=E(3,p)=(p+3) \bmod 26$
$p=D(3,c)=(c-3) \bmod 26$

The program must be able to take any key value . Here we have taken 3.

test case:
plaintext -   meet   me
ciphertext – PHHW PH

test case:
ciphertext – bat
plaintext – yxq

PROGRAM:

d = {'a':0, 'b':1, 'c':2, 'd':3, 'e':4, 'f':5, 'g':6, 'h':7, 'i':8, 'j':9,
'k':10, 'l':11, 'm':12, 'n':13, 'o':14, 'p':15, 'q':16, 'r':17, 's':18,
't':19, 'u':20, 'v':21, 'w':22, 'x':23, 'y':24, 'z':25 }

key = int(input('Enter Value of Key:'))

while True:
    print('1. Encryption \t2. Decryption \t3. Exit')
    choice = int(input('Enter Your Choice:'))

    if choice == 1:
        pt = input('plaintext- ').lower()
        ct = ""
        for i in pt:
            if i == ' ':
                ct += ' '
                continue

```
        val = (d.get(i) + key) % 26
        for K,V in d.items():
            if V == val:
                break
        ct += K
    print('ciphertext-', ct.upper())

elif choice == 2:
    ct = input('ciphertext- ').lower()
    pt = ""
    for i in ct:
        if i == ' ':
            pt += ' '
            continue

        val = (d.get(i) - key) % 26
        for K, V in d.items():
            if V == val:
                break
        pt += K
    print('plaintext-', pt)

elif choice == 3:
    break

else:
    print('You Entered Wrong Input')
```
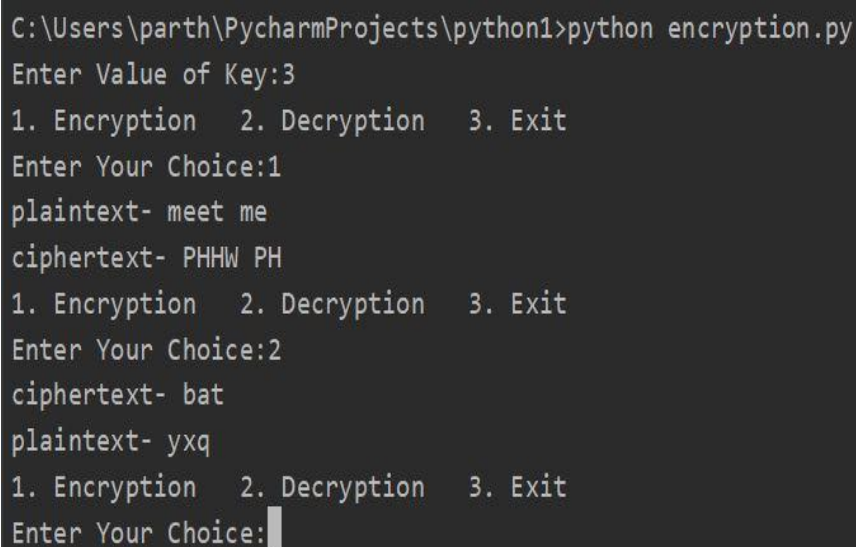
OUTPUT:

```
C:\Users\parth\PycharmProjects\python1>python encryption.py
Enter Value of Key:3
1. Encryption   2. Decryption   3. Exit
Enter Your Choice:1
plaintext- meet me
ciphertext- PHHW PH
1. Encryption   2. Decryption   3. Exit
Enter Your Choice:2
ciphertext- bat
plaintext- yxq
1. Encryption   2. Decryption   3. Exit
Enter Your Choice:
```

```
C:\Users\parth\PycharmProjects\python1>python encryption.py
Enter Value of Key:3
1. Encryption    2. Decryption    3. Exit
Enter Your Choice:1
plaintext- parth patel
ciphertext- SDUWK SDWHO
1. Encryption    2. Decryption    3. Exit
Enter Your Choice:2
ciphertext-  SDUWK SDWHO
plaintext-   parth patel
1. Encryption    2. Decryption    3. Exit
Enter Your Choice:3

C:\Users\parth\PycharmProjects\python1>
```