Q1. Create two 3×3 matrices using the random function in Numpy and perform the following operations. è Product (prod) è Multiplication (multiply) è Dot Product (dot)

```python
In [ ]:  import numpy as np
         x = np.random.randint(1,10,(3,3))
         y=np.random.randint(1,10,(3,3))
         print(x)
         print(y)
         c=np.multiply(x,y)
         a=np.matmul(x,y)
         b=np.dot(x,y)
         print("product")
         print(c)
         print("multiply")
         print(a)
         print("dot product")
         print(b)
```

```
[[5 2 9]
 [8 1 5]
 [6 6 8]]
[[8 3 4]
 [4 6 9]
 [5 6 4]]
product
[[40  6 36]
 [32  6 45]
 [30 36 32]]
multiply
[[ 93  81  74]
 [ 93  60  61]
 [112 102 110]]
dot product
[[ 93  81  74]
 [ 93  60  61]
 [112 102 110]]
```

Q2. Perform the following set operations using the Numpy functions. è Union è Intersection è Set difference è XOR

```python
In [ ]:  a=np.array([1,3,5,7,3])
         b=np.array([5,3,1,9,11])
         print("union")
         c=np.union1d(a,b)
         print(c)
         print("intersection")
         d=np.intersect1d(a,b)
         print(d)
         print("set difference")
         e=np.setdiff1d(a,b)
         print(e)
         print("xor")
```

```
f=np.bitwise_xor(a,b)
print(f)
```

```
union
[ 1  3  5  7  9 11]
intersection
[1 3 5]
set difference
[7]
xor
[ 4  0  4 14  8]
```

Q3. Create a 1D array using Random function and perform the following operations. è
Cumulative sum è Cumulative Product è Discrete difference (with n=3) è Find the unique
elements from the array

```
In [ ]:  a=np.random.randint(1,10,(6))
         print("given array")
         print(a)
         b=np.cumsum(a)
         print("cummulative sum")
         print(b)
         print("cummulative product")
         c=np.cumprod(a)
         print(c)
         print("discrete difference")
         d=np.diff(a,n=3)
         print(d)
         e=np.unique(a)
         print("unique")
         print(e)
```

```
[2 3 6 6 3 7]
cummulative sum
[ 2  5 11 17 20 27]
cummulative product
[    2     6    36   216   648  4536]
discrete difference
[-5  0 10]
unique
[2 3 6 7]
```

Q4. Create two 1D array and perform the Addition using zip(), add() and user defined
function (frompyfunc())

```
In [ ]:  a=np.random.randint(1,20,(5))
         print("first array")
         print(a)
         b=np.random.randint(1,20,(5))
         print("second array")
         print(b)
         c=np.array([a+b for a,b in zip(a,b)])
         print("zip function")
         print(c)
         d=np.add(a,b)
```

```
print("add function")
print(d)
def add(set1, set2):
    for i in range(len(set1)):
        set1[i] += set2[i]

    return set1
add(a,b)
```

```
first array
[11  2 14  6 15]
second array
[15 19  2  8 18]
zip function
[26 21 16 14 33]
add function
[26 21 16 14 33]
```

Out[ ]: array([26, 21, 16, 14, 33])

Q5. Find the LCM (Least Common Multiple) and GCD (Greatest Common Divisor) of an array of elements using reduce().

In [ ]:
```python
from functools import reduce
import numpy as np
from math import gcd


input_str = input("Enter values for the array comma-separated: ")
a = np.array([int(x) for x in input_str.split(',')])

def calculate_lcm(x, y):
    return x * y // gcd(x, y)

def calculate_gcd(x, y):
    while y != 0:
        x, y = y, x % y
    return x

lcm = reduce(calculate_lcm, a)
gcd = reduce(calculate_gcd, a)

print("LCM:", lcm)
print("GCD:", gcd)
```

```
LCM: 36
GCD: 3
```