1

In [5]:
```python
a=int(input("Enter a number "))
num=int(input("Multiples till "))
print("Multiplication of "+str(a)+" till "+str(num)+" multiples is ")
for i in range(1,num+1):
    print(f'{a} * {i} = {a*i}')
```

```
Enter a number 5
Multiples till 10
Multiplication of 5 till 10 multiples is
5 * 1 = 5
5 * 2 = 10
5 * 3 = 15
5 * 4 = 20
5 * 5 = 25
5 * 6 = 30
5 * 7 = 35
5 * 8 = 40
5 * 9 = 45
5 * 10 = 50
```

2

In [35]:
```python
def  prime(n):
    for i in range(2,n):
        if n % i == 0:
            return False
    return n

def twin(start,end):
    for i in range(start,end):
        if(prime(i) & prime(i+2)):
            print(f'({i} ,{i+2})',end=" ")

twin(2,1000)
```

```
(3 ,5) (5 ,7) (11 ,13) (17 ,19) (29 ,31) (41 ,43) (59 ,61) (71 ,73) (101 ,103)
(107 ,109) (137 ,139) (149 ,151) (179 ,181) (191 ,193) (197 ,199) (227 ,229) (2
39 ,241) (269 ,271) (281 ,283) (311 ,313) (347 ,349) (419 ,421) (431 ,433) (461
,463) (521 ,523) (569 ,571) (599 ,601) (617 ,619) (641 ,643) (659 ,661) (809 ,8
11) (821 ,823) (827 ,829) (857 ,859) (881 ,883)
```

3

In [1]:
```python
import math
def primeFactors(n):
    while n%2==0:
        print(2,end=",")
        n=n/2

    for i in range(3,int(math.sqrt(n))+1,2):
        while n%i==0:
            print(int(i),end=",")
            n=n/i

    if n>2:
        print(int(n))

n=int(input("Enter an integer: "))
primeFactors(n)
```

```
Enter an integer: 25
5,5,
```

4

In [16]:
```python
def fact(n):
    return 1 if n==1 else n*fact(n-1)



def ncr(n,r):
    return fact(n)/(fact(r)*fact(n-r))

def npr(n,r):
    return fact(n)/fact(n-r)

print(f"nCr is {ncr(10,5)}")
print(f'nPr is {npr(10,5)}')
```

```
nCr is 252.0
nPr is 30240.0
```

5

In [34]:
```python
def decimal_to_binary(n):
    if n>1:
        decimal_to_binary(n//2)
    print(n%2,end='')

decimal_to_binary(34)
```

```
100010
```

6

```
In [57]: def cubesum(n):
             sum=0
             t=n
             while t>0:
                 k=t%10
                 sum+=k**3
                 t=t//10
             return sum

         def IsArmstrong(k):
             if(k==cubesum(k)):
                 print(f'{k} is an Armstrong Number')

         def PrintArmstrong(a):
             for i in range(1,a):
                 if i==IsArmstrong(i):
                     print(i)



         num=int(input("Enter a num "))
         PrintArmstrong(num)
```

```
Enter a num 1000
1 is an Armstrong Number
153 is an Armstrong Number
370 is an Armstrong Number
371 is an Armstrong Number
407 is an Armstrong Number
```

7

```
In [62]: def prodDigits(n):
             pro=1
             t=n
             while t>0:
                 k=t%10
                 pro=pro*k
                 t=t//10
             return pro
         num=int(input("Enter a number "))
         prodDigits(num)
```

```
Enter a number 56
```

Out[62]: 30

8

```
In [18]: def get_digits(num):
             digits=[]
             while num>0:
                 num,digit=divmod(num,10 )
                 digits.append(digit)
             return digits

         def multiply_all(digits):
             multiplier=1
             while digits:
                 multiplier *=digits.pop()
             print("->",multiplier,end=" ")
             return multiplier

         def persistence(num):
             count=0
             while num>=10:
                 num=multiply_all(get_digits(num))
                 count+=1
             return count

         k=int(input("Enter a num: "))
         print("\nMPersistence ",persistence(k))
```

```
Enter a num: 86
-> 48 -> 32 -> 6
MPersistence  3
```

9

```
In [90]: def sumPdivisors(num):
             divisors=[]
             for i in range(1,num):
                 if num%i==0:
                     divisors.append(i)
             print(f"Divisors are {divisors}")
             return sum(divisors)

         a=int(input("Enter a number "))
         k=sumPdivisors(a)
         print(f"Sum is {k}")
```

```
Enter a number 51
Divisors are [1, 3, 17]
Sum is 21
```

10

In [109]:
```python
def PerfectNum(num):
    sum=0
    for i in range(1,num):
        if num%i==0:
            sum+=i
    if sum==num:
        print(sum)


def Display(k):
    for i in range(1,k):
        if PerfectNum(i)==i:
            print(i)
a=int(input("Range of Perfect Numbers "))
Display(a)
```

```
Range of Perfect Numbers 100
6
28
```

11

In [34]:
```python
x=int(input('Enter number 1: '))
y=int(input('Enter number 2: '))
sum1,sum2=0,0
for i in range(1,x):
    if x%i==0:
        sum1+=i
print(sum1)
for j in range(1,y):
    if y%j==0:
        sum2+=j
print(sum2)

if x==sum2 and y==sum1:
    print("Amicable")
```

```
Enter number 1: 220
Enter number 2: 284
284
220
Amicable
```

12

In [4]:
```python
n=int(input("Enter a num "))
lst=[]
for i in range(1,n):
    lst.append(i)
odd_num=list(filter(lambda x:x%2==1,lst))
print(odd_num)
```

```
Enter a num 20
[1, 3, 5, 7, 9, 11, 13, 15, 17, 19]
```

13

In [6]:
```python
n=int(input("Enter a num "))
lst=[]
for i in range(1,n+1):
    lst.append(i)
cubes=list(map(lambda x:x**3,lst))
print(cubes)
```

```
Enter a num 10
[1, 8, 27, 64, 125, 216, 343, 512, 729, 1000]
```

14

In [7]:
```python
n=int(input("Enter a num "))
lst=[]
for i in range(1,n+1):
    lst.append(i)
even_lst=list(filter(lambda x:x%2==0,lst))
cubes=list(map(lambda x:x**3,even_lst))
print(cubes)
```

```
Enter a num 10
[8, 64, 216, 512, 1000]
```

In [ ]: