Project 1

Introduction ¶

The non-prime numbers are the numbers that have factors other than 1 and the number itself. which means that they have more than 2 factors. Example of non-prime numbers is 4 as the factor of 4 is 1,2,4 Also, sometimes they are called composite numbers.

The primary objective of this report is to discover the false prime numbers.

In [2]:
```
# First we will define the prime numbers.
def isprime(n):
    prime= True       #Number is prime if n<2
    if n<2:
        prime= False
    for i in range(2,int(n**0.5)+1):
        if n%i==0:
            prime= False
            break
    return prime

def myprimes(n):
    numlist=[]
    for x in range(n+1):
        if isprime(x):
            numlist.append(x)
    return numlist
```

In [3]:
```
# Define function isprimelike that return True if n is primelike otherwi
def isprimelike(p):
    prime= True
    if p<2:
        prime= False
    for a in range(0,p):
        if pow(a,p,p)!=a%p:     # function pow() is the same as (a**p)%p
            prime= False
            break
    return prime
```

In [4]:
```
isprimelike(561)
```

Out[4]: True

Since the integer is True which means that it is a prime-like. Now, we need to check the false prime numbers.

In [5]:
```
def falseprime():       # Define the false prime numbers
    x=2
    notprimes=[]

    while len(notprimes)<=20:        # we need to know thw first 20 not
        if not isprime(x):
             if isprimelike(x):
                notprimes.append(x)
        x=x+1
    return notprimes
```

In [6]:
```
def primary(n):             # we want to find the primary decomposition
    decomplist= []
    plist= []
    for x in range(n+1):
        if isprime(x):
            plist.append(x)

    for x in plist:
        while n%x==0:
            decomplist.append(x)
            n=n/x
        if n==1:
             break
    return decomplist
```

In [7]:
```
print(primary(12))
```

```
[2, 2, 3]
```

In [8]:
```
falselist=falseprime()
```

In [9]:
```
for x in falselist:
    print(primary(x))   # finding the first 20 factors for non-prime num
```

```
[3, 11, 17]
[5, 13, 17]
[7, 13, 19]
[5, 17, 29]
[7, 13, 31]
[7, 23, 41]
[7, 19, 67]
[5, 29, 73]
[7, 31, 73]
[13, 37, 61]
[7, 11, 13, 41]
[13, 37, 97]
[7, 73, 103]
[3, 5, 47, 89]
[7, 13, 19, 37]
[11, 13, 17, 31]
[7, 11, 13, 101]
[13, 37, 241]
[7, 13, 19, 73]
[17, 41, 233]
[7, 13, 31, 61]
```

When looking at these prime numbers, we realize that all of them are odd numbers. The factors of most of the non-prime numbres starts with 7. Also, most of the non-prime numbers have three factors. Only a few of them have four factors.

Conclusion

During this project, we found the first twinty non-prime numbers. Those numbers showed the multiple factors for all non-prime numbers.

In [ ]:
```
```