In [1]:
```python
###1.1 (a) Use list comprehension to remove zeros on the list, so that the list

limit = 1_000 # set the limit
numbers = [] # use numbers list to create a list with numbers from 1 to limit
for i in range(0, limit+1):
    numbers.append(i)

numbers[1] = 0 # cross out 0

p=2 # implicitly cross out 1
while p < limit:
    for i in range(p*2,limit+1,p):
        numbers[i]=0 # cross out multiple of p
    p = p + 1
    while p < limit and numbers[p]==0:
        p = p + 1 # try next number which had not been crossed out

# the final list of all zeros and prime numbers
#print(numbers)

non_zero = [i for i in numbers if i != 0]
print("Numbers excluding zeros are:")
print(non_zero)
```

```
Numbers excluding zeros are:
[2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73,
79, 83, 89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163,
167, 173, 179, 181, 191, 193, 197, 199, 211, 223, 227, 229, 233, 239, 241, 251,
257, 263, 269, 271, 277, 281, 283, 293, 307, 311, 313, 317, 331, 337, 347, 349,
353, 359, 367, 373, 379, 383, 389, 397, 401, 409, 419, 421, 431, 433, 439, 443,
449, 457, 461, 463, 467, 479, 487, 491, 499, 503, 509, 521, 523, 541, 547, 557,
563, 569, 571, 577, 587, 593, 599, 601, 607, 613, 617, 619, 631, 641, 643, 647,
653, 659, 661, 673, 677, 683, 691, 701, 709, 719, 727, 733, 739, 743, 751, 757,
761, 769, 773, 787, 797, 809, 811, 821, 823, 827, 829, 839, 853, 857, 859, 863,
877, 881, 883, 887, 907, 911, 919, 929, 937, 941, 947, 953, 967, 971, 977, 983,
991, 997]
```

In [2]:
```python
###1.2 (b) Create a function that would return how many prime numbers are there
###range of [a,b]. The program should ask user for the values of a and b, the pr
###the answers.

start = int(input("Please give value a:"))
end = int(input("Please give value b:"))
count = 0
#print("prime numbers between", start,"and", lower, "are:", count)

for i in range(start,end):
    if i>1:
        for j in range(2,i):
            if(i % j==0):
                break
        else:
#            print(i)
            count += 1
#print("prime numbers between", start,"and", end, "are:", count )
print("There are", count, "prime numbers in between", start,"and", end, ".")
```

```
There are 4 prime numbers in between 130 and 150 .
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