`PrimeOmega` gives how many multipled primes there are in total in a prime factorization.

```
In[∘]:= FactorInteger@12
Out[∘]= {{2, 2}, {3, 1}}
```

The primes are `2, 3`, the quantities are `2, 1`.

```
In[∘]:= PrimeOmega@12
Out[∘]= 3
```

`PrimeOmega` is the sum of the quantities.

```
In[∘]:= FactorInteger@327
Out[∘]= {{3, 1}, {109, 1}}
```

```
In[∘]:= PrimeOmega@327
Out[∘]= 2
```

How many primes there are in the factorization itself can be inferred from the size of the resulting list.

```
In[∘]:= FactorInteger@330
Out[∘]= {{2, 1}, {3, 1}, {5, 1}, {11, 1}}
```

```
In[∘]:= Length@FactorInteger@330
Out[∘]= 4
```

Let’s create an index from the quantity of primes in a factorization together with the multiplicity of primes in the factorization, to create a rough “size” for each factorization.

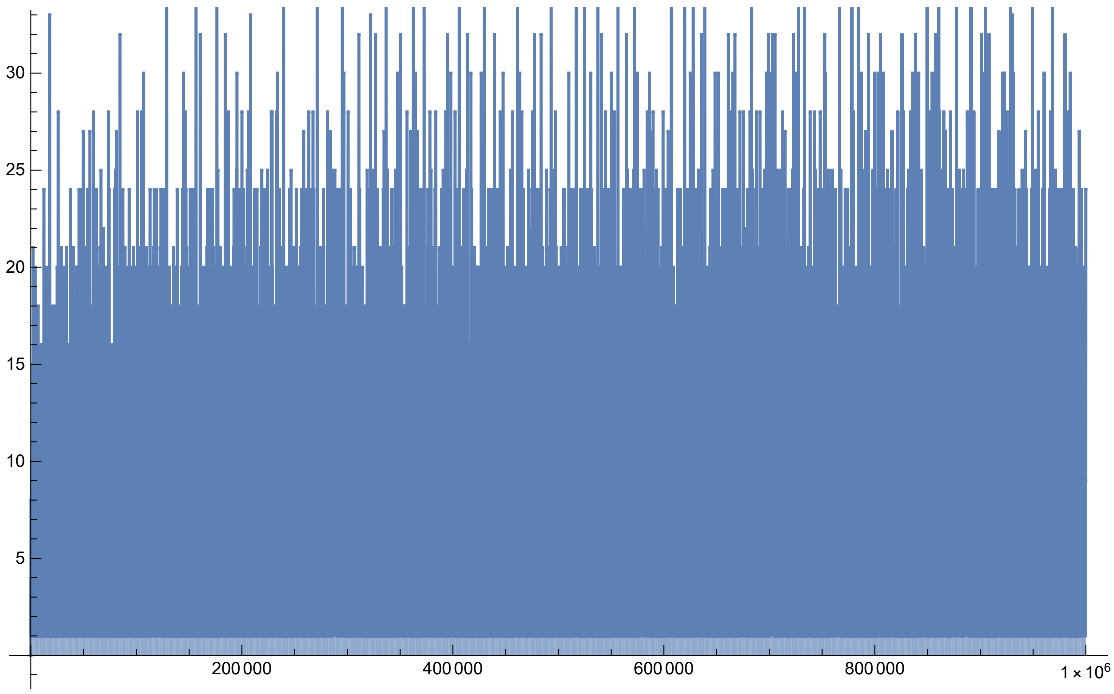
```
In[1]:= Clear[FacSize];
FacSize=Function[{n},Length@FactorInteger@n*PrimeOmega@n];
```

```
In[∘]:= {FacSize@12, FacSize@327, FacSize@330}
Out[∘]= {6, 4, 16}
```

Which agrees with the prior observations.
Let’s plot the “factorization size” as a function of each integer:

In[3]:= `DiscretePlot[FacSize@x, {x, 1, 1000000, 99}, ExtentSize → Full]`

Out[3]=

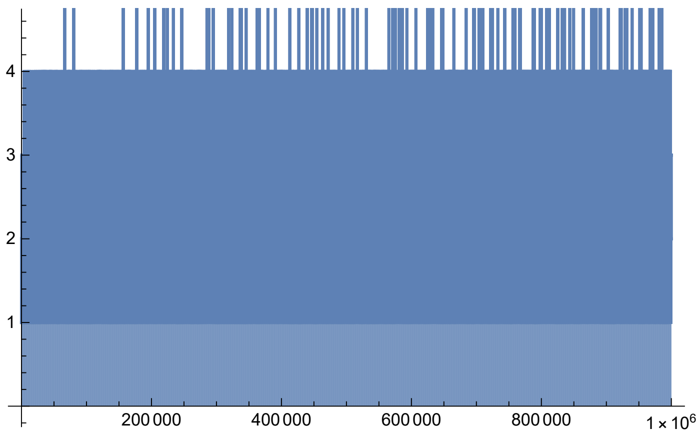


This tells there is a ceiling of approximately 35.

If only the number of primes is plotted,

In[4]:= `DiscretePlot[Length@FactorInteger@x, {x, 1, 1000000, 99}, ExtentSize → Full]`

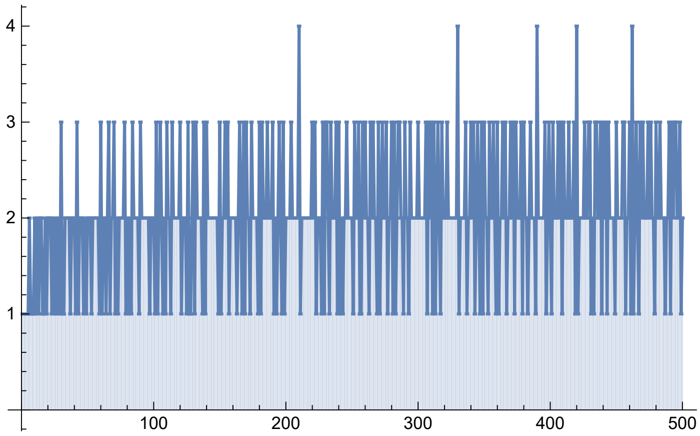
Out[4]=



Let’s zoom in to the graph.

In[6]:=
```
DiscretePlot[Length@FactorInteger@x, {x, 1, 500}, ExtentSize → Full]
```

Out[6]=



This seems to indicate no matter the size of the integer, there seems to be a clear upper bound on the size, by whatever estimate, of its prime factorization.

It is interesting to note that seemingly primes larger than the fifth prime, 11, are “useless”, in that they are not solicited by any factorization.

In[ ]:=
```
Prime@5
```

Out[ ]=
```
11
```