

Pensieve Header: Brute force "The Strong Law of Small Numbers" (<http://www.math.sjsu.edu/~hsu/courses/126/Law-of-Small-Numbers.pdf>), for no reason at all.

## Example 1

```
In[1]:= Do[
  Print[
    k → FactorInteger[2^(2^k) + 1]
  ],
  {k, 0, 5}
]
0 → {{3, 1}}
1 → {{5, 1}}
2 → {{17, 1}}
3 → {{257, 1}}
4 → {{65 537, 1}}
5 → {{641, 1}, {6 700 417, 1}}
```

## Example 2

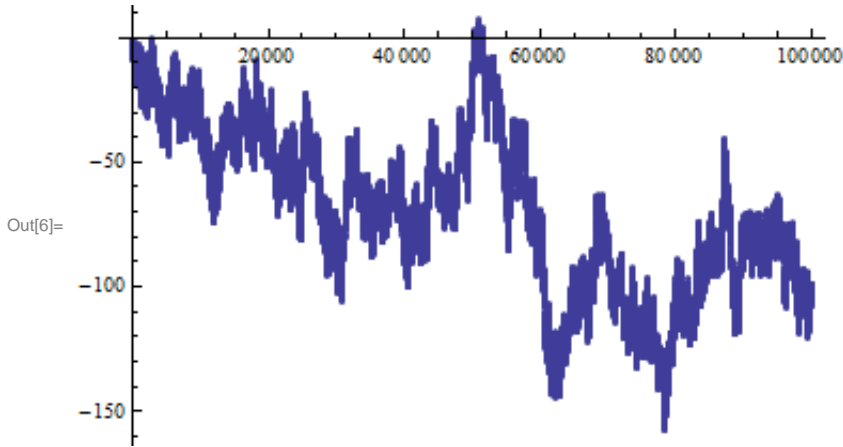
```
In[2]:= Do[
  Print[
    Prime[k] → FactorInteger[2^Prime[k] - 1]
  ],
  {k, 5}
]
2 → {{3, 1}}
3 → {{7, 1}}
5 → {{31, 1}}
7 → {{127, 1}}
11 → {{23, 1}, {89, 1}}
```

## Example 3

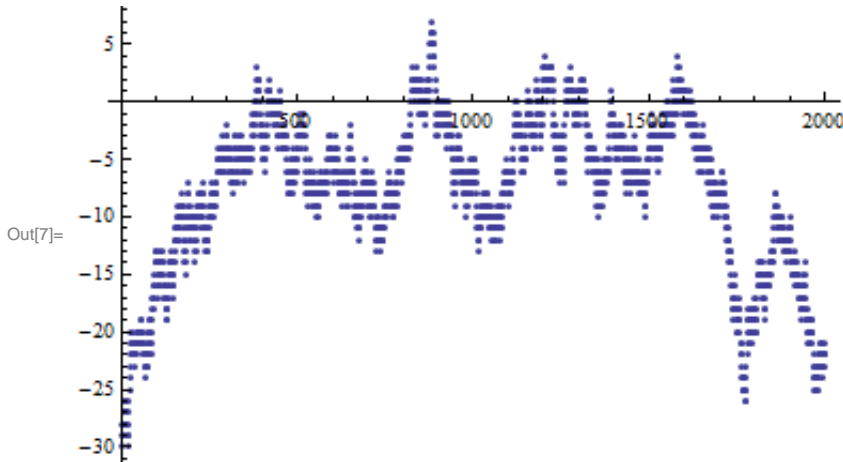
```
In[3]:= Stats[n_] := Length[Select[Prime /@ Range[n], (1 == (#~Mod~4)) &]];
Stats[100 000]
```

```
Out[4]= 49 949
```

```
In[5]:= Draw[n_] := Rasterize[ListPlot[
  t = 0;
  Table[
    t += If[(Prime[k] ~Mod~4) == 1, 1, -1],
    {k, n}
  ]
]];
Draw[100 000]
```



```
In[7]:= Rasterize[ListPlot[
  t = 0;
  Take[Table[
    t += If[(Prime[k] ~Mod~4) == 1, 1, -1],
    {k, 100 000}
  ], {50 000, 52 000}]
]
```



```
In[8]:= 2 Stats[50 881]
```

Out[8]= 50 888

## Example 4

```
In[9]:= Plus @@ Table[
  divs = Divisors[k];
  ((1 = Length[Select[divs, 3 == #~Mod~4 &]) ≤ Length[divs] - 1),
  {k, 1, 100 001, 2}
]
```

```
Out[9]= 50 001 True
```

## Example 5