In[2]:=
```
(* Explain the meaning of each line *)
```

In[3]:=
```
(*x_n is drawn from a uniform distribution in [0,1]*)
x[n_] := RandomReal[]
```

In[4]:=
```
(*x_1*)
x[1]
```

Out[4]= 0.289361

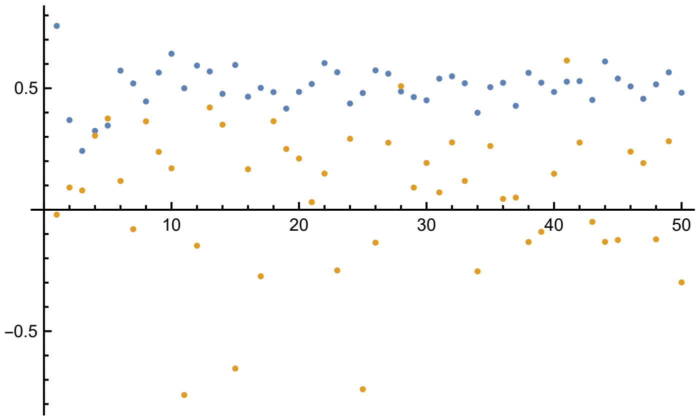
In[5]:=
```
(*x_2*)
x[2]
```

Out[5]= 0.839529

In[6]:=
```
(*Average of x_1, x_2, x_3... upto x_n, in the limit n→∞,
the distribution of this average approaches to a gaussian with 0 standard deviation,
which is a dirac delta distribution*)
AvgX[n_] := Sum[x[j], {j, 1, n}] / n
(*Average of x_1, x_2, x_3... upto x_n, subtracted from mean of the uniform distribution,
scaled by √n . This is the random variate appearing in the Central Limit Theorem,
its distribution approaches towards a Gaussian with finite standard deviation*)
CLTX[n_] := (Sum[x[j], {j, 1, n}] / n - 0.5) √n
```

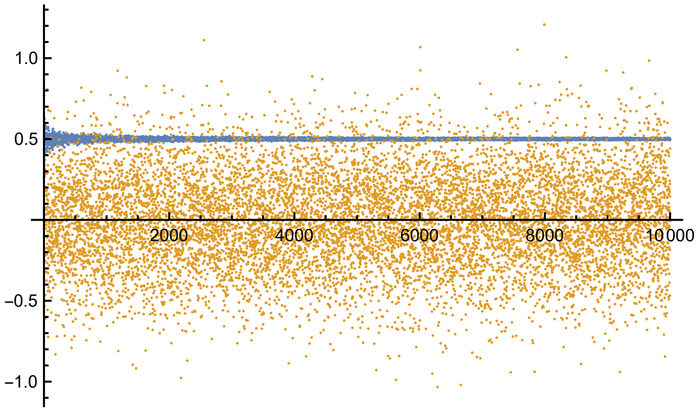
In[8]:=
```
(*As we can indeed see, the distribution of the average is being squished for
 large n but the random variate appearing in CLT has an almost constant σ*)
ListPlot[ {Table[AvgX[n], {n, 1, 50}], Table[CLTX[n], {n, 1, 50}]}]
```

Out[8]=



In[11]:=
```
(*As we can indeed see, the distribution of the average is being
 squished for large n (approaching a δ distribution) but the random
 variate appearing in CLT is a Gaussian with almost constant σ*)
ListPlot[ {Table[AvgX[n], {n, 1, 10^4}], Table[CLTX[n], {n, 1, 10^4}]}]
```

Out[11]=



In[12]:=
```
(*A better representation is the histogram, where we can see the distributions*)
Histogram[{Table[AvgX[n], {n, 1, 10^4}], Table[CLTX[n], {n, 1, 10^4}]},
 Automatic, "Probability", ChartLabels → {"Average", "CLT"}]
```

Out[12]=