117-PROBA-urnas

April 23, 2018

```
In [1]: def actualiza_urna(L):
            b,n=L[0],L[1]
            x = randint(1,b+n)
            if x<=b:
                return [b+1,n]
            else:
                return [b,n+1]
```

```
In [2]: actualiza_urna(actualiza_urna([1,3]))
```

```
Out[2]: [1, 5]
```

```
In [3]: def camino(L,n):
            LL = [L]
            for int in srange(n):
                LL.append(actualiza_urna(LL[-1:][0]))
            return LL
```

```
In [4]: camino([1,1],10)
```

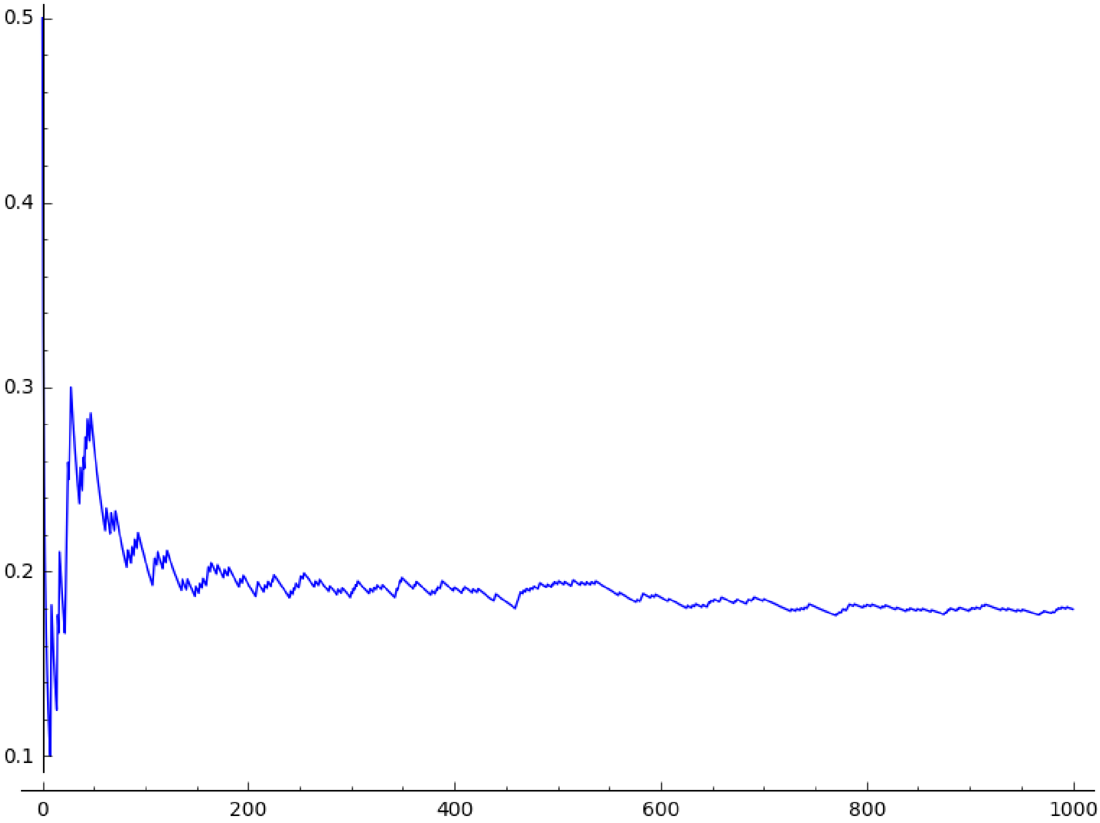
```
Out[4]: [[1, 1],
         [2, 1],
         [2, 2],
         [3, 2],
         [4, 2],
         [4, 3],
         [4, 4],
         [5, 4],
         [6, 4],
         [6, 5],
         [6, 6]]
```

```
In [5]: L = [L[0]/(L[0]+L[1]) for L in camino([1,1],10)];L
```

```
Out[5]: [1/2, 1/3, 1/4, 2/5, 1/2, 4/7, 5/8, 2/3, 7/10, 8/11, 3/4]
```

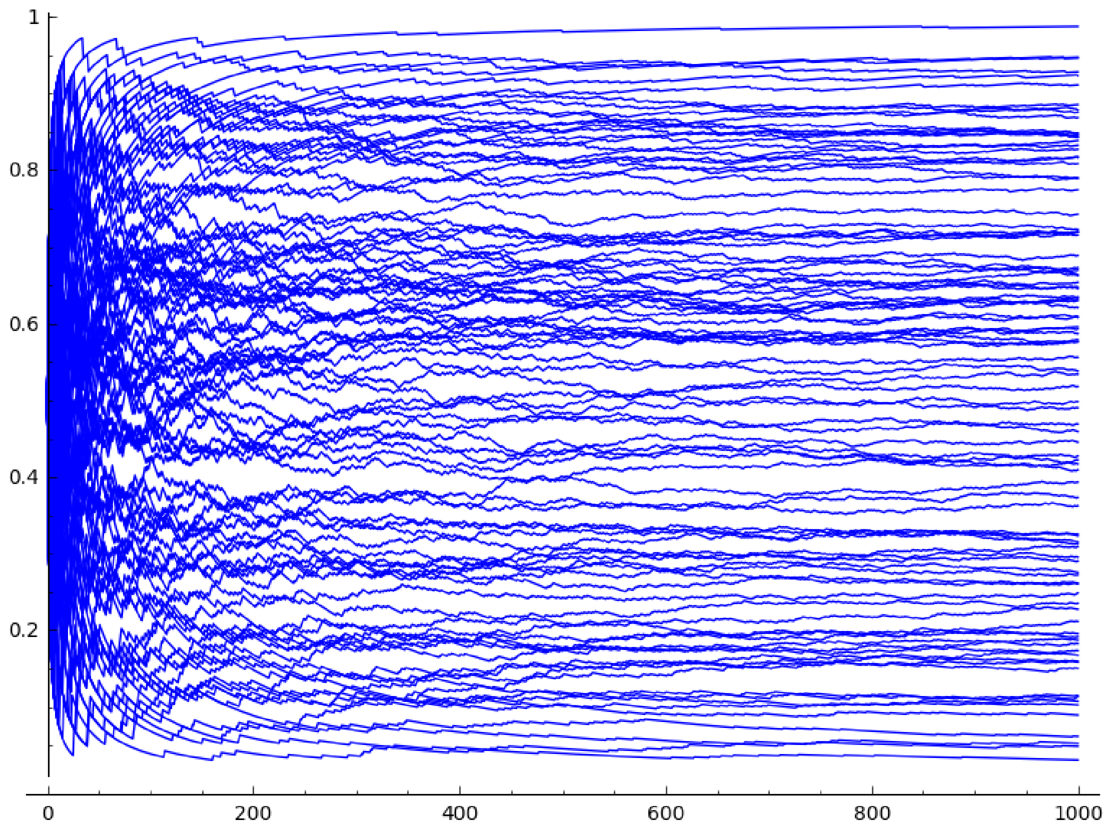
```
In [6]: line(zip(srange(1001),[L[0]/(L[0]+L[1]) for L in camino([1,1],1000)]))
```

```
Out[6]:
```



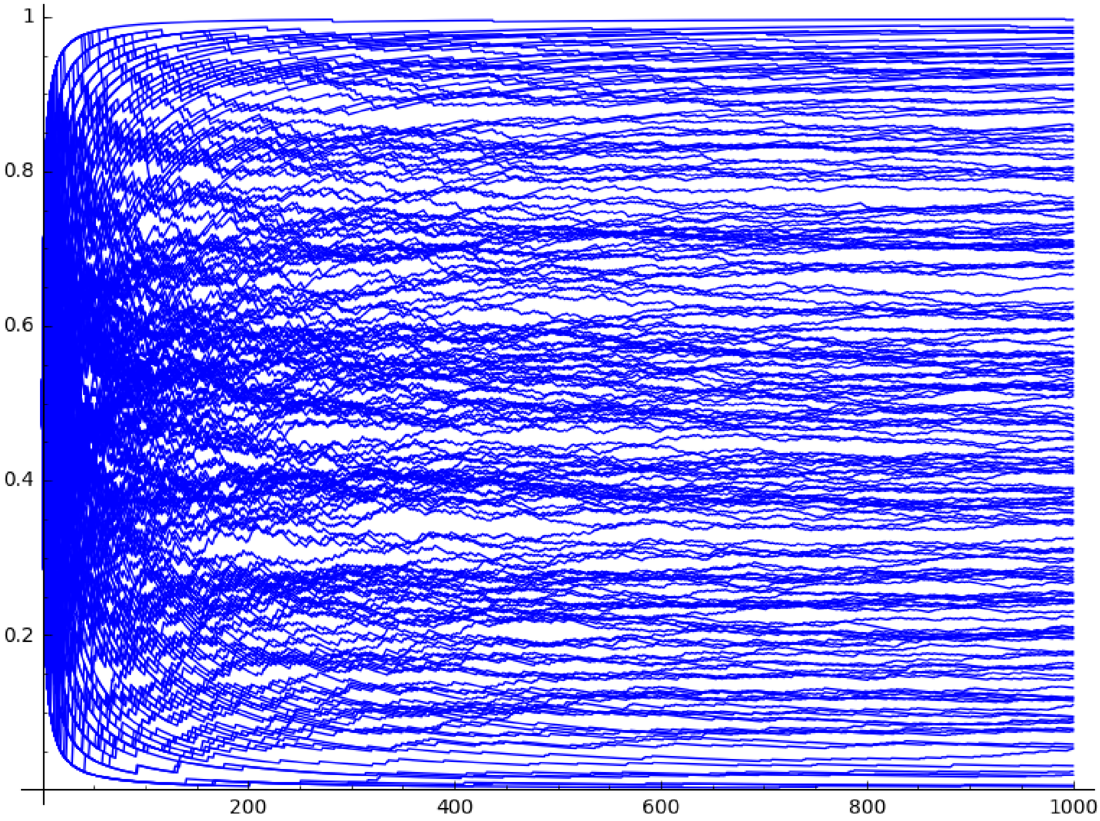
```
In [7]: sum([line(zip(srange(1001),[L[0]/(L[0]+L[1]) for L in camino([1,1],1000)])) for muda i
```

```
Out[7]:
```



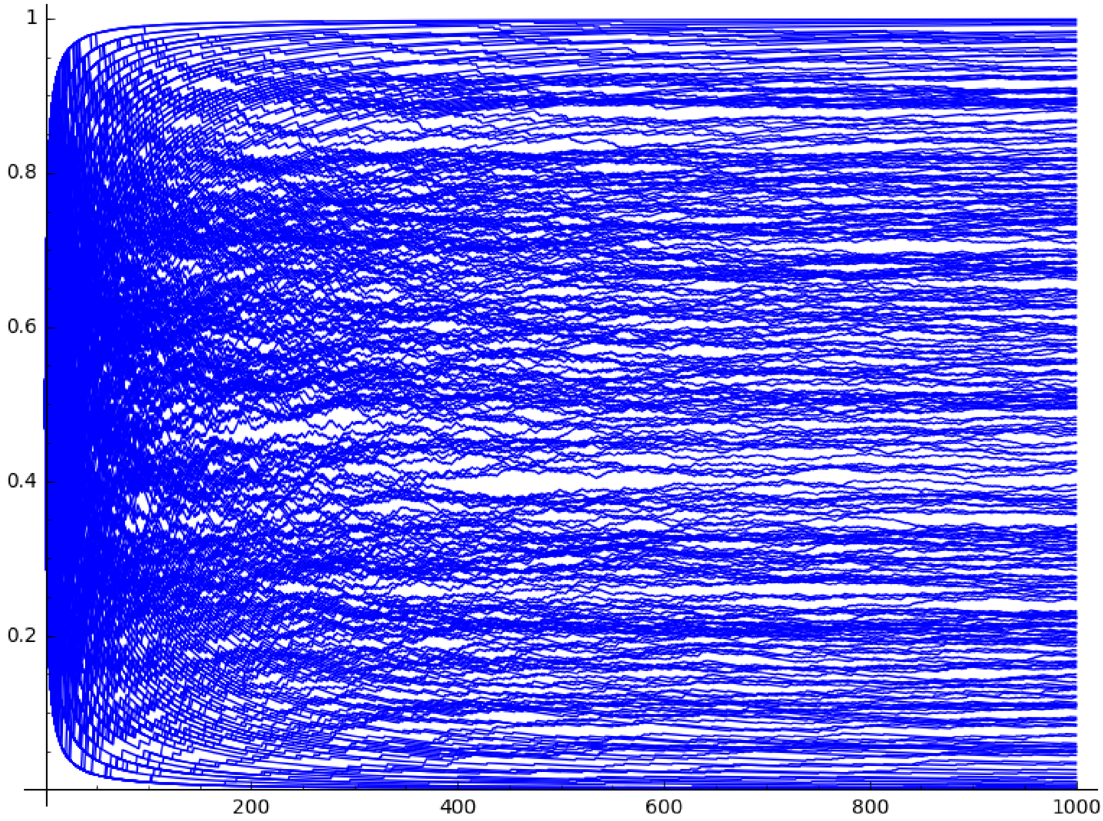
```
In [8]: sum([line(zip(srange(1001),[L[0]/(L[0]+L[1]) for L in camino([1,1],1000)])) for muda i
```

Out[8]:



```
In [9]: sum([line(zip(srange(1001),[L[0]/(L[0]+L[1]) for L in camino([1,1],1000)])) for muda in
```

```
Out[9]:
```



```
In [10]: def uniformidad(N,n):
             LL = []
             for int in srange(N):
                 L = [1,1]
                 for int2 in srange(n):
                     L = actualiza_urna(L)

                 LL.append(L[0]/(L[0]+L[1]))
             return LL
```

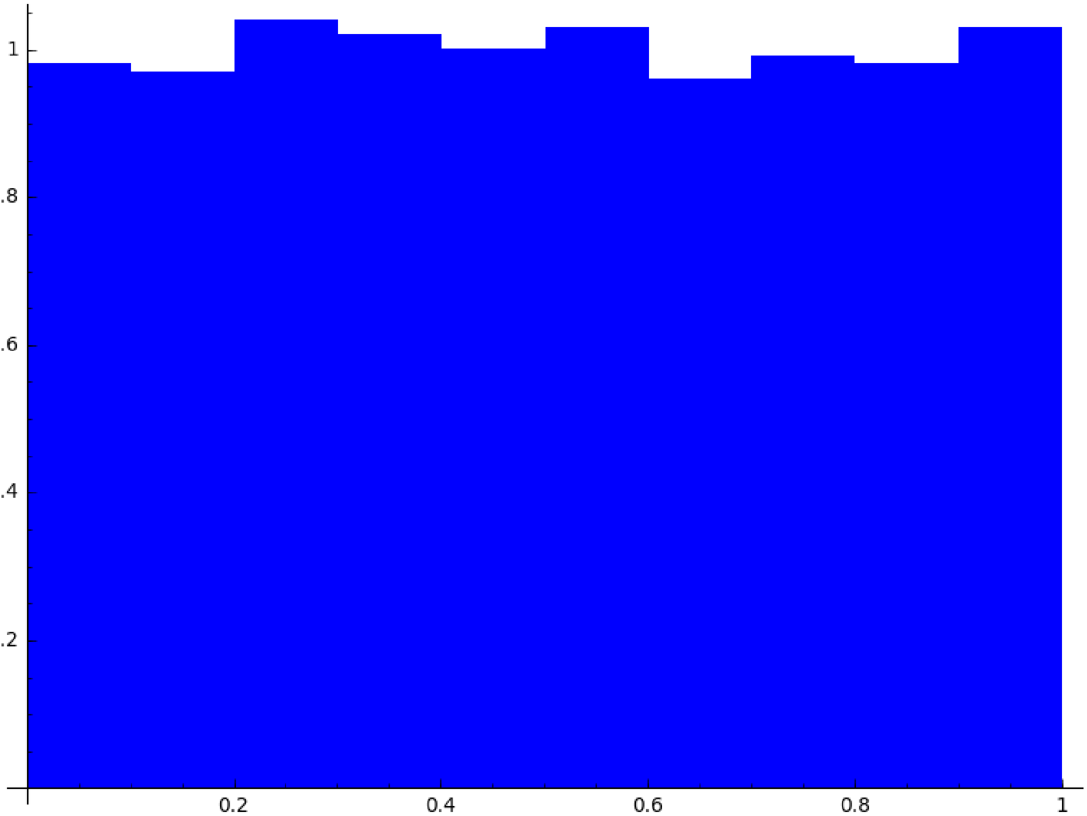
```
In [11]: t = finance.TimeSeries(uniformidad(1000,10000))
```

```
In [12]: t.histogram(bins=10)
```

```
Out[12]: ([98, 97, 104, 102, 100, 103, 96, 99, 98, 103],
          [(0.0008998200359928015, 0.10077984403119376),
           (0.10077984403119376, 0.2006598680263947),
           (0.2006598680263947, 0.3005398920215957),
           (0.3005398920215957, 0.40041991601679666),
           (0.40041991601679666, 0.5002999400119976),
           (0.5002999400119976, 0.6001799640071985),
           (0.6001799640071985, 0.7000599880023995),
           (0.7000599880023995, 0.7999400119976005),
           (0.7999400119976005, 0.8998200359928014),
           (0.8998200359928014, 0.9997000599880024)])
```

```
In [13]: t.plot_histogram(bins=10,normalize=True)
```

```
Out[13]:
```


1
0.8
0.6
0.4
0.2
0.2
0.4
0.6
0.8
1