

simulating_many_coin_flips

November 28, 2017

1 Simulating Many Coin Flips

```
In [1]: import numpy as np
```

```
In [2]: # number of heads from 10 fair coin flips  
np.random.binomial(10, 0.5)
```

```
Out[2]: 5
```

```
In [3]: # results from 20 tests with 10 coin flips  
np.random.binomial(10, 0.5, 20)
```

```
Out[3]: array([4, 6, 1, 7, 4, 5, 5, 4, 7, 7, 6, 7, 8, 6, 2, 3, 8, 4, 3, 4])
```

```
In [4]: # mean number of heads from the 20 tests  
np.random.binomial(10, 0.5, 20).mean()
```

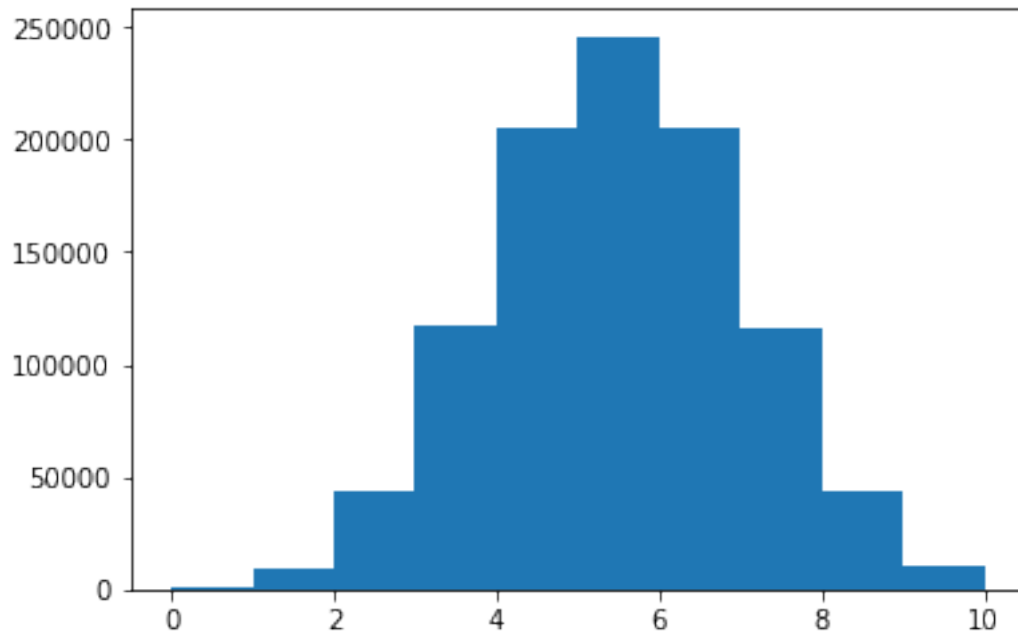
```
Out[4]: 5.2000000000000002
```

```
In [5]: # reflects the fairness of the coin more closely as # tests increases  
np.random.binomial(10, 0.5, 1000000).mean()
```

```
Out[5]: 5.0015280000000004
```

```
In [6]: import matplotlib.pyplot as plt  
% matplotlib inline
```

```
In [7]: plt.hist(np.random.binomial(10, 0.5, 1000000));
```



In [8]: *# gets more narrow as number of flips increase per test*
`plt.hist(np.random.binomial(100, 0.5, 1000000));`

