Central Limit Theorem

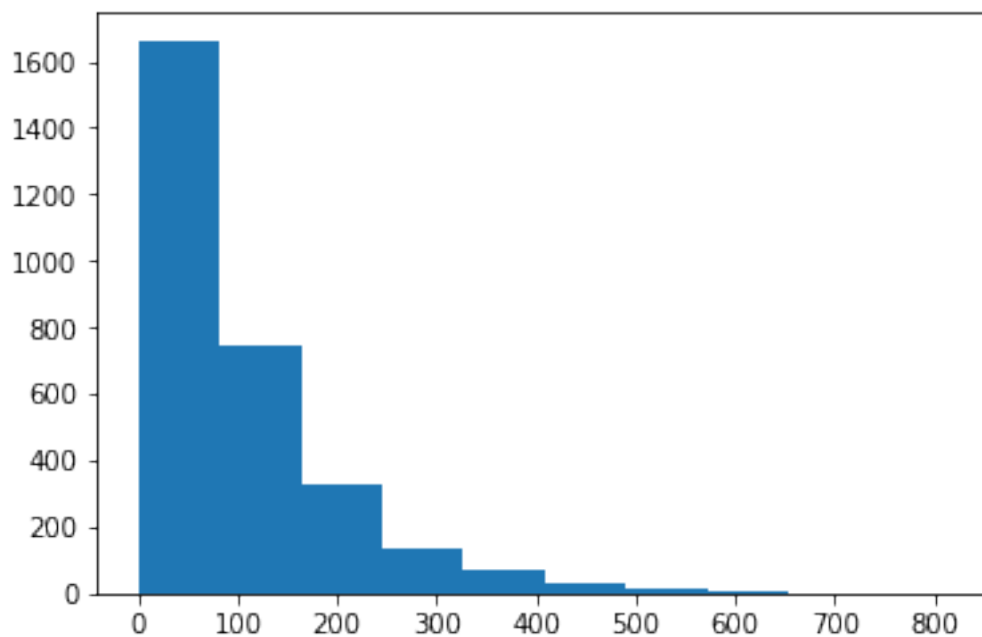December 1, 2017

0.0.1 Central Limit Theorem

Work through the questions and use the created variables to answer the questions that follow below the notebook.

Run the below cell to get started.

```
In [1]: import numpy as np
        import matplotlib.pyplot as plt

        %matplotlib inline
        np.random.seed(42)

        pop_data = np.random.gamma(1,100,3000)
        plt.hist(pop_data);
```



```
In [5]: pop_data.mean()
```

```
Out[5]: 100.35978700795846
```

```
In [6]: np.std(pop_data)
```

```
Out[6]: 99.778601879689063
```

1. In order to create the sampling distribution for the average of 3 draws of this distribution, follow these steps:

a. Use numpy's **random.choice** to simulate 3 draws from the `pop_data` array. b. Compute the mean of these 3 draws. c. Write a loop to simulate this process 10,000 times, and store each mean into an array called **means_size_3**. d. Plot a histogram of your sample means. e. Use **means_size_3** and **pop_data** to answer the quiz questions below.

```python
In [2]: means_size_3 = []
        for _ in range(100000):
            means_size_3.append(np.random.choice(pop_data, size=3).mean())
```

```python
In [4]: plt.hist(means_size_3);
```
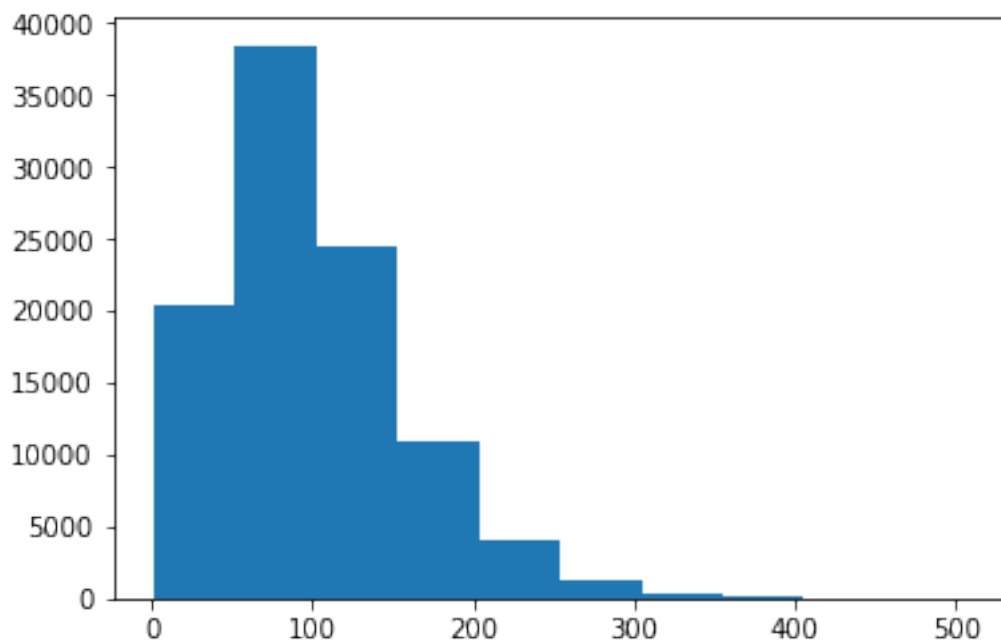


```
In [8]: np.mean(means_size_3)
```

```
Out[8]: 100.34733486008804
```

```
In [9]: np.std(means_size_3)
```

```
Out[9]: 57.494305338065914
```

2