

Homework #1 – Tools and Fundamentals

Problem 2

Name: Tejas Harishchandra Acharya

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In [1]: # Imports
import random
import matplotlib.pyplot as plt
```

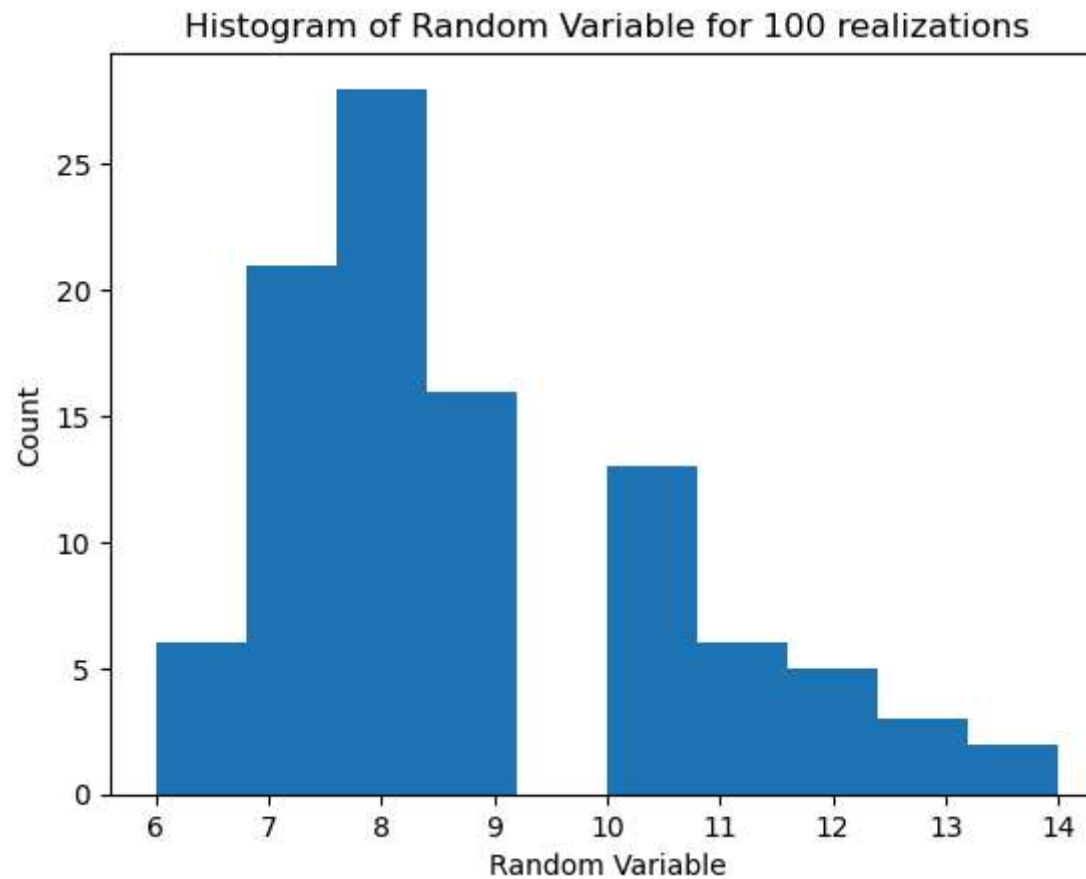
```
In [2]: # Constants
SUM = 4
```

```
In [3]: def get_random_variable():
    n = 0
    running_sum = 0
    while running_sum <= SUM:
        n += 1
        running_sum += random.uniform(0, 1)
    return n
```

```
In [4]: realizations = 100

random_var_list = [get_random_variable() for i in range(realizations)]

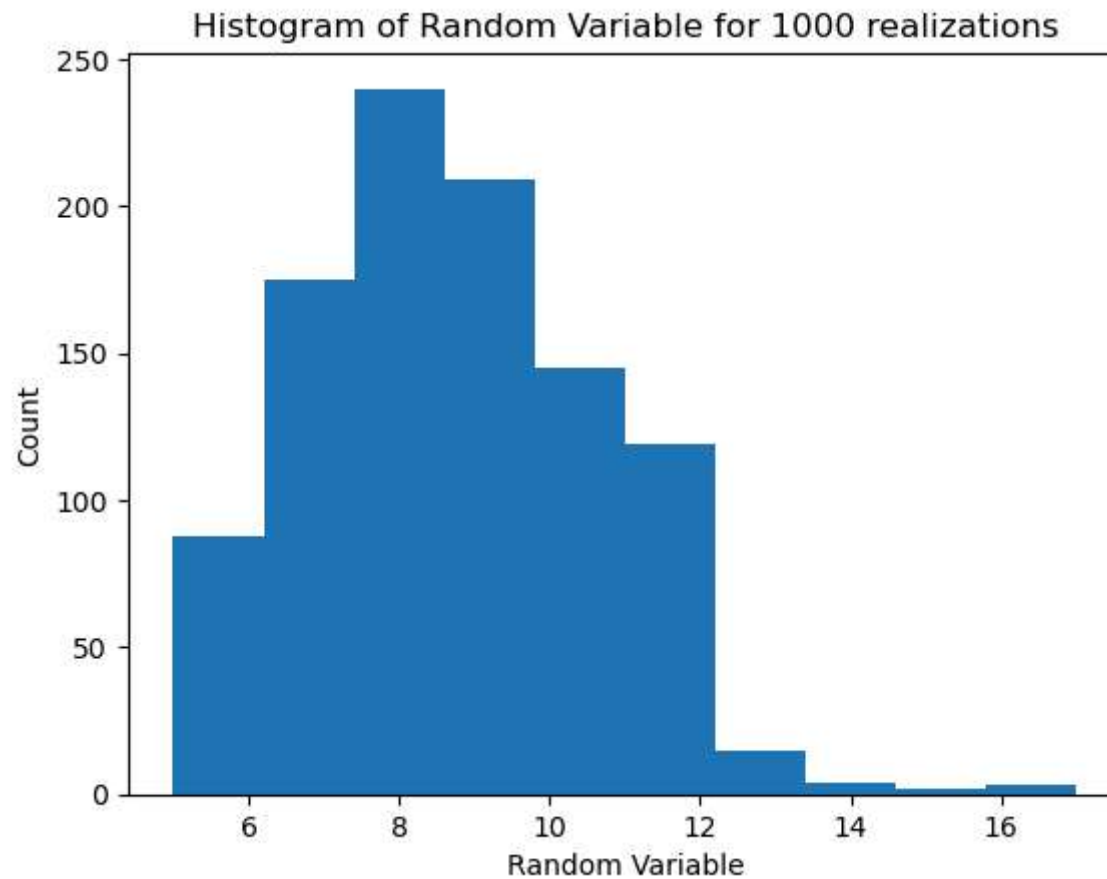
plt.figure()
plt.hist(random_var_list)
plt.xlabel("Random Variable")
plt.ylabel("Count")
plt.title(f"Histogram of Random Variable for {realizations} realizations")
plt.show()
```



```
In [5]: realizations = 1000

random_var_list = [get_random_variable() for i in range(realizations)]

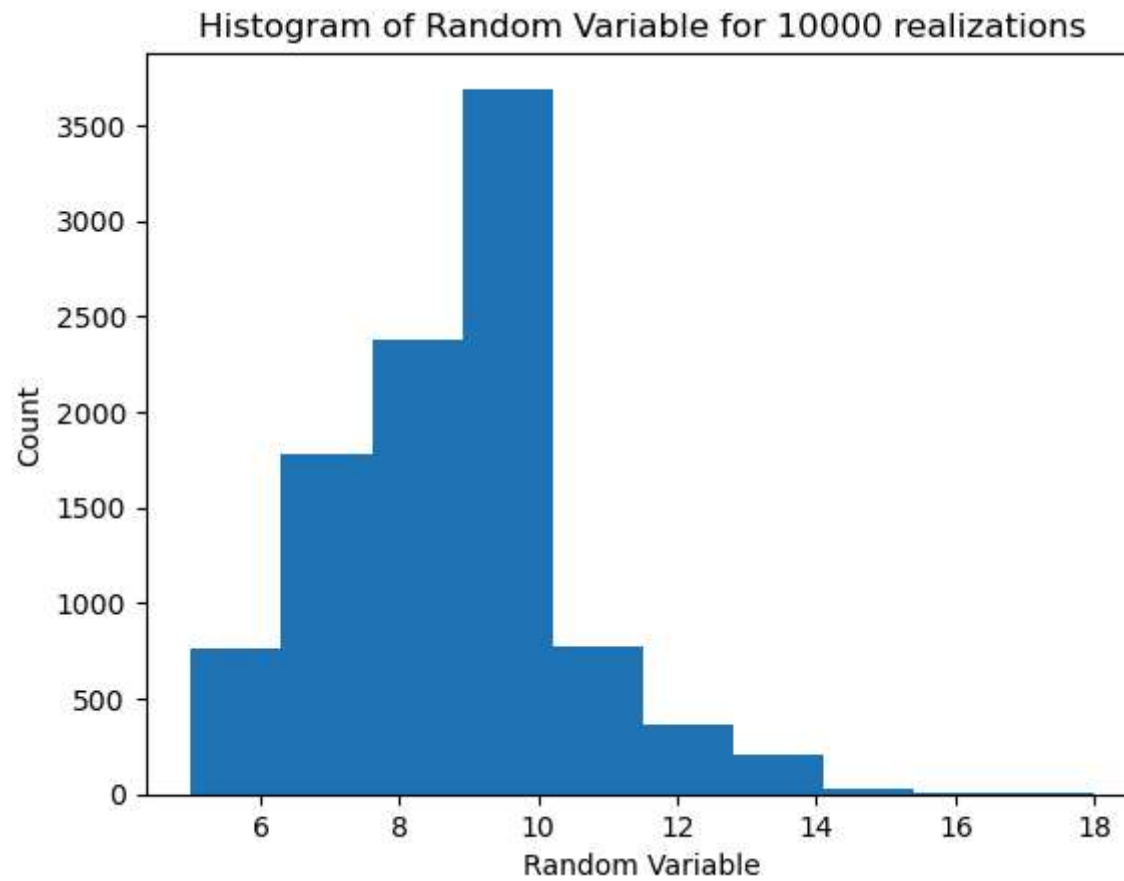
plt.figure()
plt.hist(random_var_list)
plt.xlabel("Random Variable")
plt.ylabel("Count")
plt.title(f"Histogram of Random Variable for {realizations} realizations")
plt.show()
```



```
In [6]: realizations = 10000

random_var_list = [get_random_variable() for i in range(realizations)]

plt.figure()
plt.hist(random_var_list)
plt.xlabel("Random Variable")
plt.ylabel("Count")
plt.title(f"Histogram of Random Variable for {realizations} realizations")
plt.show()
```



```
In [7]: print("E[N] = 9")
```

E[N] = 9