

```
# !/usr/bin/env python3
# (c) Dana Hughes 2021
#
# describe what the program is doing
#
import matplotlib
import matplotlib.pyplot as plt
import math
import random
import sys

seed = 12345678
n = seed

for counter in range(0,20):
    counter += 1
    n = str(n**2)
    mid = int(len(n)/2)
    n = int(n[mid-4:mid+4])
    print(f"#{counter}: {n}")

print(f"We began with {seed}, and"
      f" have repeated ourselves after {counter} steps"
      f" with {n}.")

print("\n")
x = [random.gauss(0,1) for counter in range(10000)];
y = [random.gauss(5,5) for counter in range(10000)];
z = plt.hist(y,200, label = ('x vs. y'))
plt.title("Graph 1")
plt.xlabel("Value")
plt.ylabel("Probability")
plt.legend()

x = range(10)
y = [xi + random.uniform(-1.0,1.0) for xi in x]
plt.figure()
plt.plot(x,y,label = ('x vs. y'))
plt.title("Graph 2")
plt.xlabel("Value")
plt.ylabel("Probability")
plt.legend()
```



```
#1: 41576527
#2: 60759738
#3: 74576182
#4: 60692169
#5: 53937792
#6: 28540583
#7: 56487797
#8: 87120991
#9: 6707282
#10: 87631827
#11: 33710335
#12: 38668581
#13: 25915655
#14: 62117407
#15: 57225240
#16: 72809305
#17: 19489458
#18: 83897313
#19: 75912861
#20: 76246520
```

We began with 12345678, and have repeated ourselves after 20 steps with 76246520

<matplotlib.legend.Legend at 0x7f6bd2ea77d0>

