Source Code======================================================================

import random as rand

import matplotlib.pyplot as plt

import math

def HW4\_2(min\_v, max\_v):

numbers = []

total = 0

for x in range(2000):

numbers.append(rand.randrange(min\_v, max\_v + 1))

for a in range(len(numbers)):

total = total + numbers[a]

mean = total / 2000

print('mean:', mean)

prob = 1/(max\_v - min\_v + 1)

possible\_out = []

possible\_out.append(numbers[0])

for v in range(len(numbers)):

overlap = 0

for d in range(len(possible\_out)):

if(numbers[v] == possible\_out[d]):

overlap = 1

if(overlap == 0):

possible\_out.append(numbers[v])

var = 0

for s in possible\_out:

var = var + possible\_out[s] \* possible\_out[s] \* prob

print('varience:', var)

std = math.sqrt(var)

print('standard deviation:', std)

#plot histogram

step = (abs(max\_v) + abs(min\_v)) / 4

bin\_range = [min\_v, min\_v + step, min\_v + 2 \*step, min\_v + 3\*step, max\_v]

plt.hist([numbers], histtype='bar', bins = 10,

color = ['r'], label=['Numbers'])

plt.xticks(bin\_range)

plt.legend()

plt.title('-1 to 1 Probability Histogram')

plt.xlabel('Value')

plt.ylabel('Amount of Numbers')

plt.show()

min\_v = -1

max\_v = 1

HW4\_2(min\_v, max\_v)

Output==========================================================================

mean: 0.0295

varience: 0.6666666666666666

standard deviation: 0.816496580927726

