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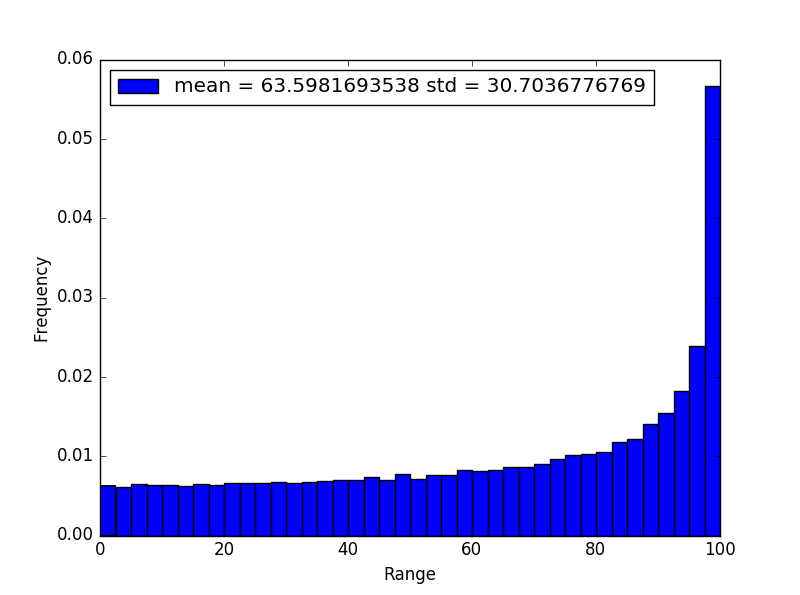
EE 380

Lab 3

Problem 1:

Using Taylor Series:

By Simulation:



import numpy as np

import matplotlib.pyplot as plt

gravity = 9.8

rounds = 80000

velocity = np.sqrt(980)

f = np.zeros(rounds)

p = np.zeros(rounds)

for i in range(rounds):

angle = np.random.random() \* np.pi / 2

f[i] = velocity \* velocity / gravity \* np.sin(2 \* angle)

mean = np.mean(f)

std = np.std(f)

labels= ["mean = " + str(mean) + " std = " + str(std)]

plt.hist(f, 40, normed = True)

plt.xlabel("Range")

plt.ylabel("Frequency")

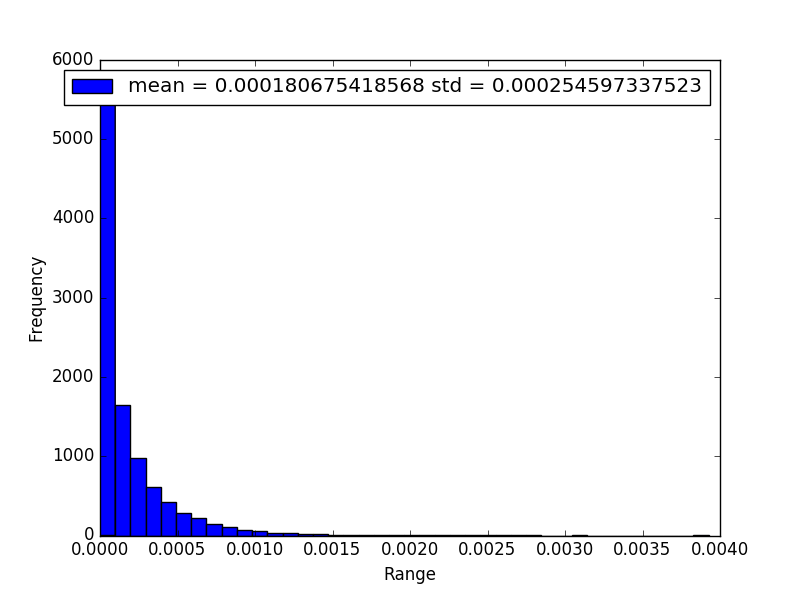
plt.legend(labels, loc = 0)

plt.show()

Problem 2:

Using Taylor Series:

By Simulation:



import numpy as np

import matplotlib.pyplot as plt

rounds = 50000

R = 5

P = np.zeros(rounds)

for i in range(rounds):

I = (np.random.randn() \* 3 \* .002)

P[i] = I \* I \* R

mean = np.mean(P)

std = np.std(P)

labels= ["mean = " + str(mean) + " std = " + str(std)]

plt.hist(P, 40, normed = True)

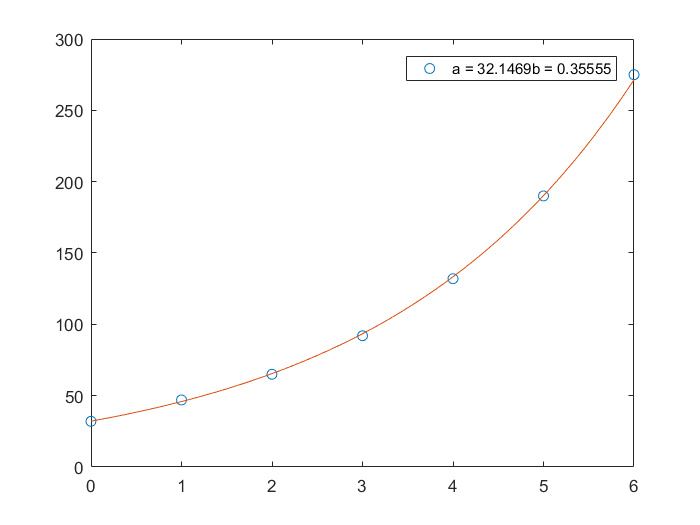
plt.xlabel("Range")

plt.ylabel("Frequency")

plt.legend(labels, loc = 0)

plt.show()

Problem 3:



clear;

clc;

A = [0,1,2,3,4,5,6];

B =[32,47,65,92,132,190,275];

plot(A,B,'o')

[P]=polyfit(A,log(B),1);

b=P(1);

a=exp(P(2));

func =@(x)(a\*exp(b\*x));

legend(['a = ',num2str(a),'b = ', num2str(b)])

hold on

fplot(func,[0,6])

hold off