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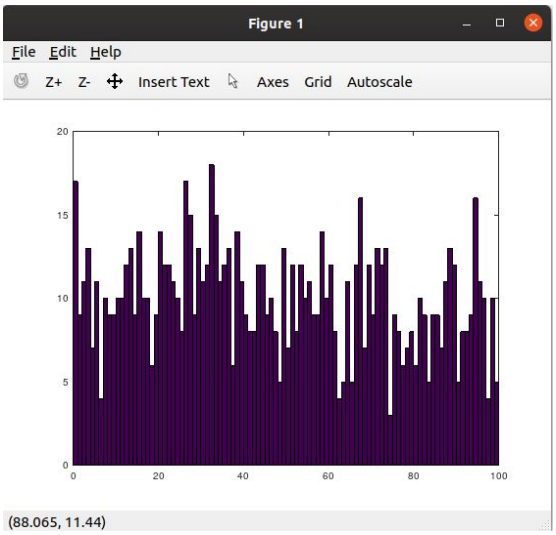
Numerical Methods

4/17/20 - mistakenly thought it was due Friday night which is why it is late. My apologies.

Homework 7

1. See Random.m. I basically changed the multiplier to a different constant than the one in the book, and also added in a level of it building on itself, by having the new seed set to the old seed + the last random value, then multiplied by k and modulus j. This only does not occur on the production of the second seed as there has not yet been calculated a random number to add to that seed.

   a. 

2. See Double_Integral.m

   a.
```
>> f = @(x, y) sin(sqrt(log(x + y + 1)))
f =

@(x, y) sin (sqrt (log (x + y + 1)))

>> Double_Integral(f)
j =  1000
vol =  0.56415
j =  2000
vol =  0.56309
j =  3000
vol =  0.56339
j =  4000
vol =  0.56458
j =  5000
vol =  0.56420
j =  5000
vol =  0.56420
>>
```

3. See PiEst.m

a.
```
>> n=2500
n =  2500
>> f = @(x) sqrt(4 - x^2)
f =

@(x) sqrt (4 - x ^ 2)

>> PiEst(n, f)
X =  3.1476
ans =  3.1476
>>
```

4. See maxim.m

a.
```
>> f = @(x1, x2, x3) (e^x1 + x2)^2 + 3*(1 - x3)^2
f =

@(x1, x2, x3) (e ^ x1 + x2) ^ 2 + 3 * (1 - x3) ^ 2

>> maxim(f)
n =  1000
max =  30.798
n =  1250
max =  30.798
n =  1500
max =  30.798
n =  1750
max =  30.798
n =  2000
max =  30.798
n =  2250
max =  32.194
n =  2500
max =  32.194
n =  2750
max =  32.194
n =  3000
max =  32.194
n =  3250
max =  32.194
n =  3500
max =  32.194
n =  3750
max =  32.194
n =  4000
max =  32.194
n =  4250
max =  32.194
n =  4500
max =  32.194
n =  4750
max =  32.194
n =  5000
max =  32.194
```