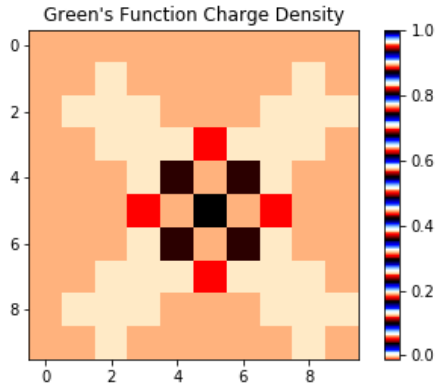
Prob 2a)

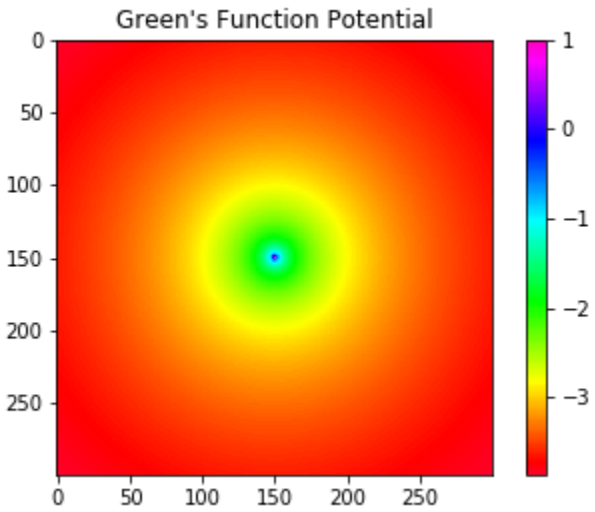
```
benkirane/Desktop/Computational Phys1
V at [0,0] is 1.0
V at [1,0] is -4.440892098500626e-16
V at [2,0] is -0.5000000000000004
V at [5,0] is -1.1609640474436804
```

We get that V @ (1,0) is = 0 as expected…
V @ (2,0) = -½ as expected …
And as mentioned in the problem, V @ (5,0) should roughly equal -1.05, which is close to my result of -1.16

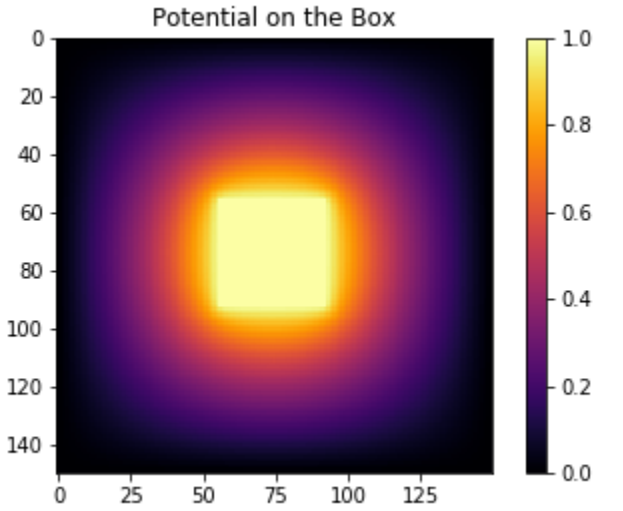
Still trying to figure out exactly why there is an error, must have to do with an assumption in the approximation?

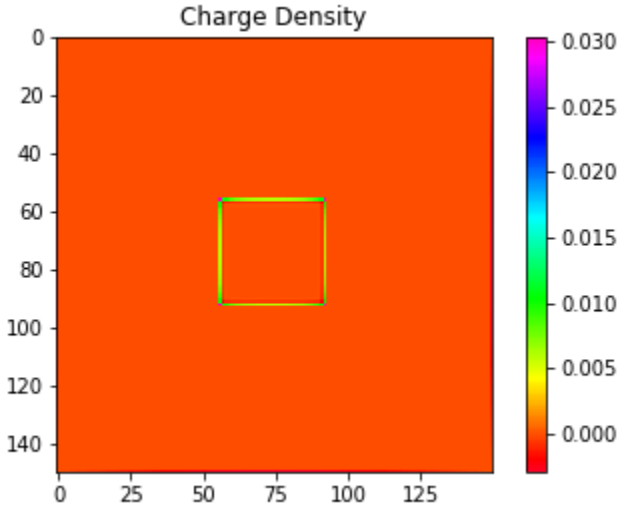
And utilizing Green's function, I get this Charge Density and Potential:

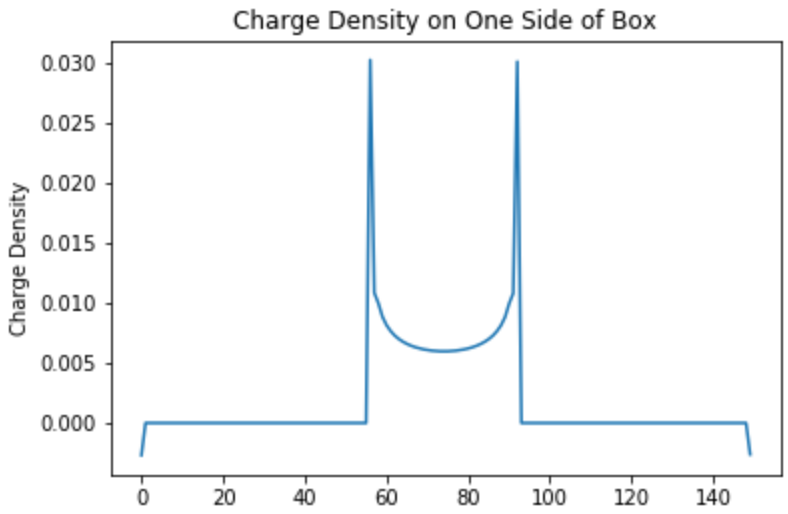




Prob 2b)


Potential on the Box
0
20
40
60
80
100
120
140
0
25
50
75
100
125
1.0
0.8
0.6
0.4
0.2
0.0

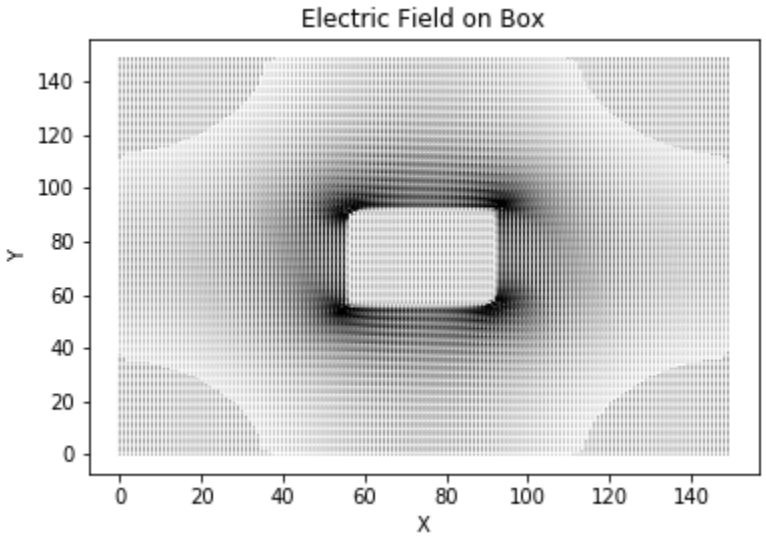

Charge Density
0
20
40
60
80
100
120
140
0
25
50
75
100
125
0.030
0.025
0.020
0.015
0.010
0.005
0.000



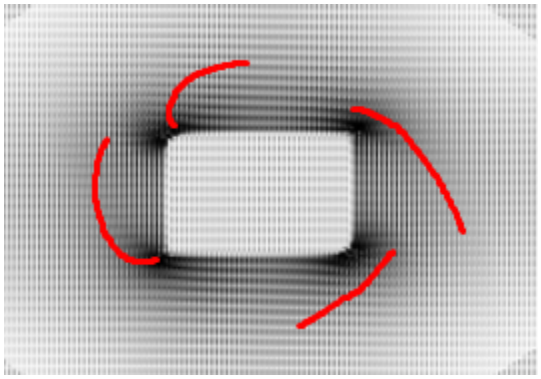
This is the charge density profile at the side of our box.

Prob 2c)

Mean Potential = 1.0000000076806908 with STD = 6.289054585500542e-06
The potential is obviously nearly constant within the ‘box’



This agrees with predictions as field lines are orthogonal to equipotentials and we can see the field having higher line densities at the box sides and most importantly the corners. I do notice however a mild counterclockwise rotation of the fields around the corners (mild tail on equipotential bulks if you pay close attention):



Not entirely sure why this occurs but it’s interesting to note that this is consistent with varying grid sizes.

All code for Problem 2 can be found in PSET8.py on GitHub…
Thank you for grading my problem sets this semester. Cheers!