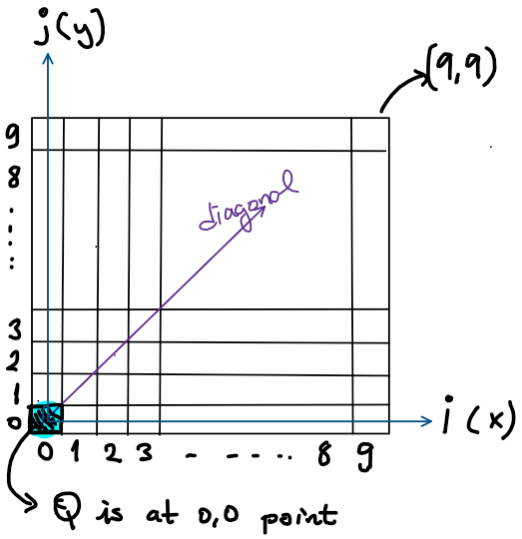
Akdeniz University 2024 Spring Physics II Homework

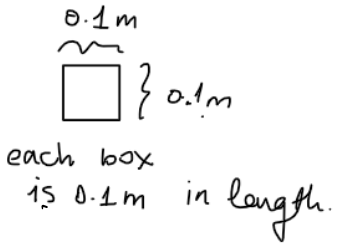
- Write the codes in python or in java or in MS excel or in any other preferred language.
- Feel free to utilize ChatGPT (or a similar AI guidance tool) for coding assistance. If you choose to use it, kindly make it explicit in your response. No points will be deducted for using AI guidance tools.
- Your homework should include plots, programs scripts and images of your calculations (if any). You can upload a program script document and a pdf/word file that includes the plots and any calculations you write. If you wish you can make everything into a single pdf file.

Mandatory: Have you employed ChatGPT (or a similar AI guidance tool)? If yes, please copy and paste the conversation with it and provide commentary on any modifications you made (if applicable) to arrive at your answers.

1) 75p Write a code (python or java or MS excel or any other language) to calculate the following: In this problem we will calculate the electric potential of a point charge at various points. The charge will be located at the bottom left of the matrix. Each cell is 0.1 m long. The charge is the last digit of your ID number in nC (nanocoulomb). If you id no is 20??????13, your charge is 3 nC, if 20???????01 your charge is 1nC …etc.

a) Create a matrix 10x10 (10 rows, 10 columns) , the point charge is at i,j=[0,0] point.
b) Calculate the potential at each point in the matrix, (you will calculate 10x10-1= 99 values) Save this data.
c) Plot 2 dimensional image of the matrix by appropriate graphing tools.
d) Plot V for i=[1, 9] and j=0 x direction, V vs x
e) Plot V for diagonal direction i;j =[1;1] to [9,9], V vs r (r is in diagonal direction)
f) *On this data, which points have the same V potential value? Can you draw equipotential lines on the data? How would you change this problem, so that you can draw equipotential lines ?*





2) 25p Use your programming skills to demonstrate / solve another problem from Physics II topics.