Practical Test 5

1. Setting up for Practical Test 5

Within your home directory (or a temporary directory) create FOP/**PracTest5** for the test.

2. Type in and modify a Python program

Download the code from the assessment page, test5.zip. You will be making a single plot of combined data, and then running the program multiple times using a parameter sweep.

Modify the code to:

1. Fix any errors (there should be 3)
2. **Plot**: (1 mark)
    a. Add a figure title "SIR Model with r: <rvalue>, a: <avalue>".
    Make sure it uses the values from variables – don't hard-code numbers in the string.
    b. Change the x-axis label "# Days", and the y-axis label "# People"
    c. Print the resultarray values to 6 decimal places, with commas between
    d. Modify the colours and markers:
        i. Susceptible people as a solid black line
        ii. Recovered as green triangles
        iii. Infected people as red diamonds
    e. Save the plot with a name to indicate the r and a values

3. **Parameter Sweep:** (2 marks)
    a. Change the test5.py code to take command line arguments for r and a values
    b. Using the sweep code provided, set up a parameter sweep for the simulation – varying the r and a values. Redirect output ">" to a r/a named csv (file for Task 4)
    c. Document each line of code in the sweep script

4. **Jupyter notebook and pandas:** (1 mark)
    a. Create a jupyter notebook and use pandas to load in csv data from one of the sweep runs and plot it (you don't need to set the colours and titles/labels)

3. Update the README

You should know this...

4. Submission

Zip up all files and submit your test via Blackboard using the link on the Assessment page.

End of Test

- Hint # 1 - "r" and "a" values are noted in the comments
- Hint #2 – build a string for the title
    - plt.title(f"SIR model.... {trans_const}<the rest>")
    - plt.title needs a single string as an argument, so you need to build a string with all the things you want in the title.
- Hint #3 – getting S column from the 2d array
    - resultarray[:,0] # gives the "S" values
- Hint #4 – In an f-string, adding :width.precision after the value will update field width and precision {value:5.4}
- Hint #5 – changing line colour
    - plt.plot(resultsarray[:,0], "ks") # black squares
- Hint #6 – command line arguments
    - You'll need to import sys, then use sys.argv[?] to access the command line values
    - You can test this by running the program on the command line (without the sweep)