Exercise 3
Scientific Data Visualization
CSCE 5320 – Spring 2021
Distributed: Sunday, February 21
Due: Thursday, March 5
[Solutions to this assignment must be submitted via CANVAS prior to midnight on the due date. Submissions no more than one day late will not be penalized. Submissions up to one week late will be penalized 10 points. Submissions more than week late and less than two weeks late will be penalized 20 points. Submissions will not be accepted after two weeks. THIS IS AN INDIVIDUAL ASSIGNMENT]

Purpose: Familiarity with colormap visualizations and goals of good visualization plots.

What to do: Consider again the plot of a two-variable Gaussian function $z = f(x,y) = e^{(x^2+y^2)}$. as in Section 2.1 of Chapter 2 of the text. Assume you know the ranges of interest $[x_{min}, x_{max}]$ and $[y_{min}, y_{max}]$ of the two independent variables. Consider the range $X=[-1x1]$ and $Y=[-1x1]$ which is divided into a 30x30 grid.
　　　　The "Hand-in" section below is self-explanatory with respect to what else to do.

Hand-in: (i) An elevation plot with no shading of $f(x,y)$ with the domain plane; (ii) a colormap rendering of $f(x,y)$ using a grayscale colormap having 30 distinct shades of gray – also show the colormap bar; (iii) a colormap rendering of $f(x,y)$ using a two-hue continuous colormap – you choose the two colors – also show the colormap bar; (iv) a colormap rendering of $f(x,y)$ using a zebra colormap with 30 bands – also show the colormap bar; (v) the computer code; (vi) a list of significant sources of information (websites, etc.); (vii) a discussion of what you found to be most challenging about the assignment (10 points allocated on the grading scale); (viii) a discussion of results described below (10 points allocated on the grading scale). Item (viii) is described below.

Discussion of results. The main part will be a 4×2 table with rows labeled by type of colormap-rendered plot – height, grayscale, two-hue, zebra. The columns of the table will have the labels "best" and "least." Using the five goals of scalar plots (see notes in Module 2, 'Colormaps.pptx', or Section 5.2 of the text), populate each row of the table where:

- Best – the goal that the row-labeled plot best fulfills,
- Least – the goal that the row-labeled plot type performs the most poorly.

No prescription for the rest of the rest of the discussion document but do not leave it blank – it also is a gradable component. You may list notes that pertain to the table. For example:

- The reason(s) a particular goal was chosen for a place in the table,
- Goals that were close competitors to the ones chosen to populate the table,
- Why you chose the colors used in the two-hue plot,
- Which plot (or pair of plots) you believe would be sufficient for most scalar data exploration purpose, or
- Anything you believe important about scalar plots.