HW2

Date: Mehr 11th, Due: Mehr15th

This homework is designed to give you practice with writing functions and visualizing data. You will just be graded on whether your scripts produce the correct output, but not necessarily on how efficiently they're written.

Q1. **Semilog plot**. Over the past 6 years, the number of students in MATLAB Course has been 15, 25, 55, 115, 144, 242. Class size seems like it's growing exponentially. To verify this, plot these values on a plot with a log y scale and label it (**semilogy**, **xlabel**, **ylabel**, **title**). Use magenta square symbols of marker size 10 and line width 4, and no line connecting them. You may have to change the x limits to see all 6 symbols (**xlim**). If the relationship really is exponential, it will look linear on a log plot.

Q2. **Interpolation and surface plots**. Write a script called randomSurface.m to do the following:

a. To make a random surface, make Z0 a 5x5 matrix of random values on the range (0,1) (**rand**).

b. Make X0 and Y0 using **meshgrid** and the vector 1:5 (use the same vector for both inputs into meshgrid). Now, X0, Y0, and Z0 define 25 points on a surface.

c. We are going to interpolate intermediate values to make the surface seem smooth. Make X1 and Y1 using **meshgrid** and the vector 1:0.1:5 (again use the same vector for both inputs into meshgrid).

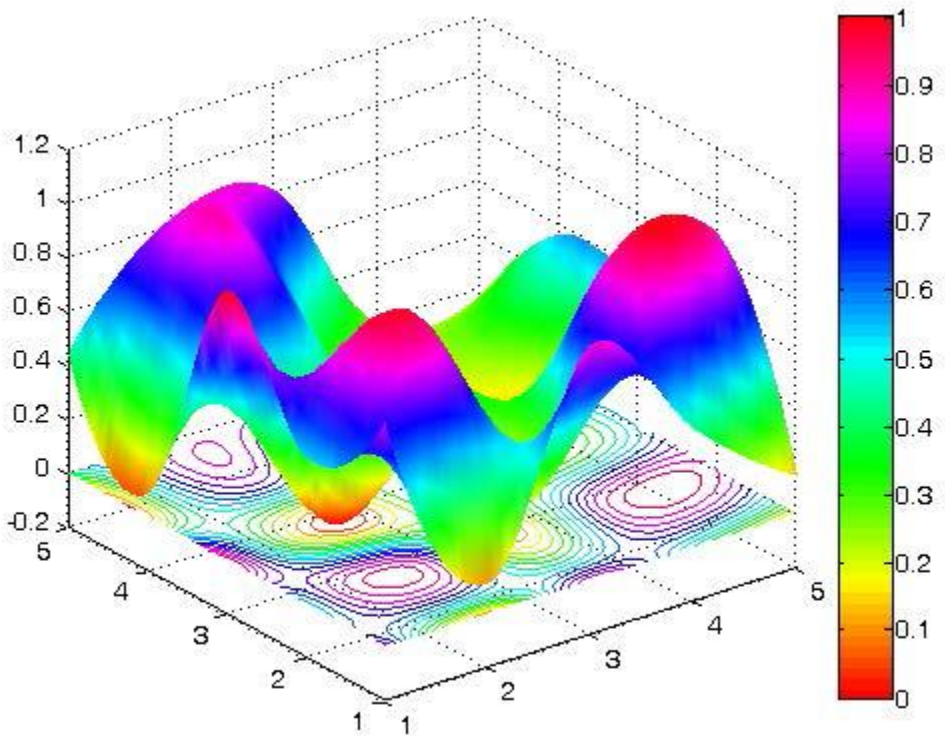
d. Make Z1 by interpolating X0, Y0, and Z0 at the positions in X1 and Y1 using cubic interpolation (**interp2**, specify cubic as the interpolation method).

e. Plot a surface plot of Z1. Set the colormap to hsv and the shading property to interp (**surf**, **colormap**, **shading**).

f. Hold on to the axes and plot the 15-line contour on the same axes (**contour**).

g. Add a colorbar (**colorbar**).

h. Set the color axis to be from 0 to 1 (**caxis**). The final figure should look something like this




3. **Loops and flow control**. Make function called loopTest(N) that loops through the values 1 through N and for each number n it should display ‘n is divisible by 2’, ‘n is divisible by 3’, ‘n is divisible by 2 AND 3’ or ‘n is NOT divisible by 2 or 3’. Use a **for** loop, the function **mod** or **rem** to figure out if a number is divisible by 2 or 3, and **num2str** to convert each number to a string for displaying. You can use any combination of **if**, **else**, and **elseif**.

Reference: https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-057-introduction-to-matlab-january-iap-2019/index.htm