%% A5

%% trial/error 3

x = sin(pi\*(2/20)\*0:9);

plot(x)

%% trail/error 6

y = sin(2\*pi\*2/20\*0:9);

plot(y)

%% trail/error 5

x = linspace(-pi,pi);

y1=sin(x);

plot (x,y1)

%% trial/error

Fs = 8000;

dt = 1/Fs;

StopTime = 0.25;

t = (0:dt:StopTime-dt)';

Fc = 60;

x = sin(2\*pi\*Fc\*t);

plot (t,x)

%% trail/error 2

x=0:0.1:10;

y=sin(x);

plot(x,y);

%% I

t = 0:0.0001:10;

a=1;

f=2;

y=a\*sin(2\*pi\*f\*t);

plot(t,y,'-r');

hold on

t = 0:0.0001:10;

a=2;

f=2.5;

y=a\*sin(2\*pi\*f\*t);

plot(t,y,'--b');

hold off

% LABELS

title('A5i Sin Wave Multi Plot')

xlabel('Time')

ylabel('Amplitude')

%% II

figure(1)

data = rand(2,100);

d = data(1,:);

e = data(2,:);

scatter(d,e)

%% 100x100 image/imagesc

figure(2)

data2 = rand(100,100);

image(data2,'CDataMapping','scaled');

colorbar

figure(3)

data3 = rand(100,100);

imagesc(data3,'CDataMapping','scaled');

colorbar

%% Histogram [(NOT CENTERED AT 0.5, COULD NOT FIGURE IT OUT AND MISSED OFFICE HOURS)]

data4 = rand(100,100);

histogram(data4);

%% Meshgrid/Contour Plot ("Meshgrid" Matlab help center carried me through this one)

x = -10\*pi:10\*pi;

y = 0:10\*pi;

[X,Y] = meshgrid(x,y);

Z = sin(X)+cos(Y);

contour(X,Y,Z)

%% Surface Plot

x1 = -10\*pi:10\*pi;

y1 = 0:10\*pi;

[X1,Y1] = meshgrid(x1,y1);

Z = sin(X1)+cos(Y1);

surf(X1,Y1,Z,'FaceAlpha',0.60,'EdgeColor','none');

colorbar

%% Plot of my choice (GEOBUBBLE)

%VERY Interesting that MatLab is able to do this.

% I tried to see if I could download different data sets like maybe global

% car crashes or global temps at specific times of the year but I could not

% find anything. If you do find something, PLEASE send me an email or talk about it in

% lecture so when I go watch the recordings I see it!

tsunamis = readtable('tsunamis.xlsx');

tsunamis.Cause = categorical(tsunamis.Cause);

geobubble(tsunamis, 'Latitude', 'Longitude', 'SizeVariable', 'MaxHeight', 'ColorVariable', 'Cause', 'Title', 'Global Tsunamis')

%% Plot of all 6 (7???)

% Adjusted for 7 plots

% Counting image and imagsc separately

% Subplots all squished together so switched

% 2x3 to 4x4 with spacing between each subplot

% Surf plot still not sizing properly it seems

subplot(4,4,1);

t = 0:0.0001:10;

a=1;

f=2;

y=a\*sin(2\*pi\*f\*t);

plot(t,y,'-r');

hold on

t = 0:0.0001:10;

a=2;

f=2.5;

y=a\*sin(2\*pi\*f\*t);

plot(t,y,'--b');

hold off

title('A5i Sin Wave Multi Plot')

xlabel('Time')

ylabel('Amplitude')

title('Subplot 1: Sin Wave')

subplot(4,4,3);

figure(1)

data = rand(2,100);

d = data(1,:);

e = data(2,:);

scatter(d,e)

title('Subplot 2: Scatter')

subplot(4,4,5);

figure(2)

data2 = rand(100,100);

image(data2,'CDataMapping','scaled');

colorbar

hold on

figure(3)

data3 = rand(100,100);

imagesc(data3,'CDataMapping','scaled');

colorbar

hold off

title('Subplot 3: Image/Imagsc')

subplot(4,4,7);

data4 = rand(100,100);

histogram(data4)

title('Subplot 4: Histogram')

subplot(4,4,9);

x = -10\*pi:10\*pi;

y = 0:10\*pi;

[X,Y] = meshgrid(x,y);

Z = sin(X)+cos(Y);

contour(X,Y,Z)

title('Subplot 5: Contour')

subplot(4,4,11);

x1 = -10\*pi:10\*pi;

y1 = 0:10\*pi;

[X1,Y1] = meshgrid(x1,y1);

Z = sin(X1)+cos(Y1);

surf(X1,Y1,Z,'FaceAlpha',0.60,'EdgeColor','none');

colorbar

title('Subplot 6: Surf')

subplot(4,4,13);

tsunamis = readtable('tsunamis.xlsx');

tsunamis.Cause = categorical(tsunamis.Cause);

geobubble(tsunamis, 'Latitude', 'Longitude', 'SizeVariable', 'MaxHeight', 'ColorVariable', 'Cause', 'Title', 'Global Tsunamis')

title('Subplot 7: Geobubble')

%% III

%% IV and V

%Index exceeds matrix dimensions.

aa = rand(3);

bb = aa(2,4)

%Undefined Function or Variable

[u,v] = sin(theta);

%Subscript Indices Must Be Real

% Positive Integers or Logicals

MATLABERROR = rand(2,4);

MATLABERROR([2 0 0])