CIEG 675 LAB#2 Due Monday January 18, 2021

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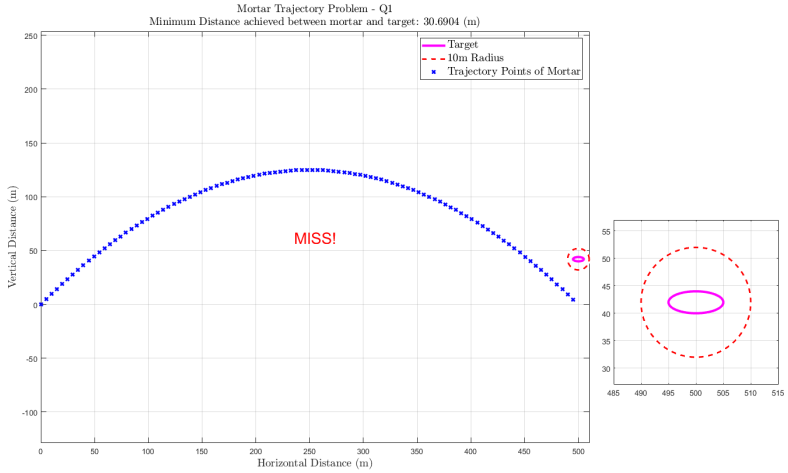
```
close all;
clear all;
% Functions are located in the same folder as this file
```

Part (1)

Develop a user-defined function that will take as input the mortar firing angle, the distance to target and the initial mortar velocity (those better in matlab can also have the target elevation as an input; others:just assume the mortar launch point elevation and target elevation are the same at zero).

```
angle = 45; % Input mortar firing angle
target_dist = 500; % Distance to target
v = 70; % Initial mortar velocity
t_elev = 40; % Target elevation
fig_num = 1; % Figure number that the user wishes to be utilized for
 plotting
% Call mortar function with the aforementioned arguments and receive a
% boolean variable (hit(1) or miss(0)) and the distance achieved
 between
% mortar and target.
[flag,dist] = mortar(angle, target_dist, v, t_elev,fig_num);
hold off;
```

```
MISS! You missed the target...
Minimum Distance: 30.6904 (m)
Try again!
```

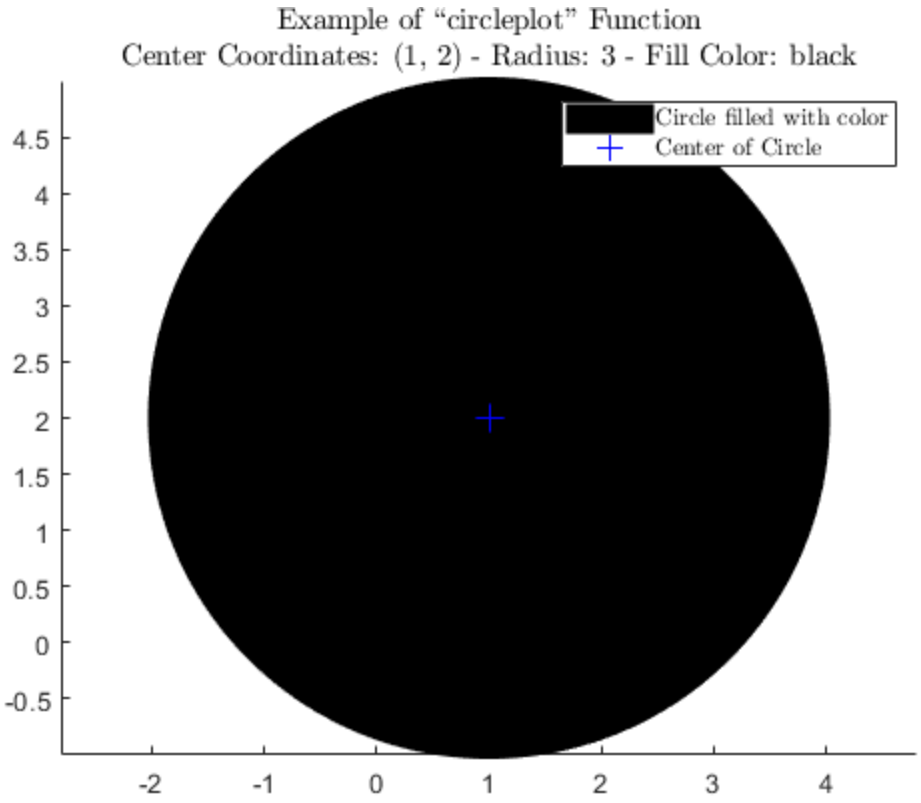


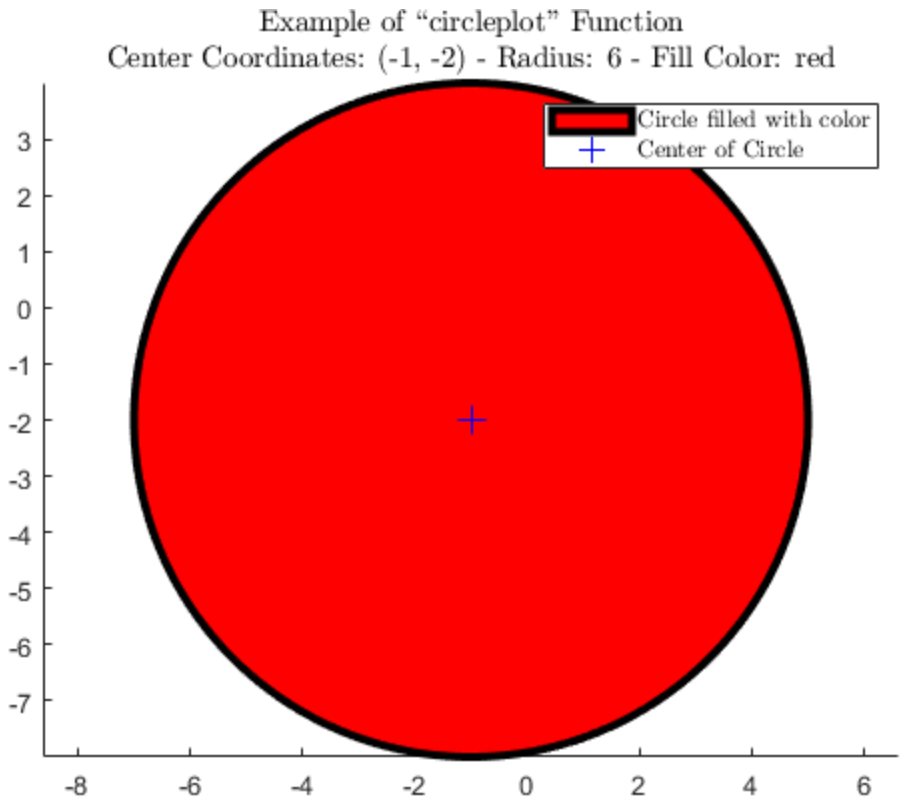
Q2 - Circle Problem

Write a user-defined function(call it circleplotor similar)that will take, as input,the coordinates for the center of a circle along withits radius, and then plots the circle.It should also plot a marker in the center of the circle (your choice of marker type and color).Make the axis equal so it actually looks like a circle. As a second step, add,as an input to your function,a color(i.e. ‘k’or ‘r’). Then use the fill command to fill in the circle with that color.Demonstrate your function works by including 2 plots of 2 different circles (different center coordinates, different radii and different fill colors).

```
% First plot of a circle
xCenter = 1; % Define the x-coordinate for the center of a circle
yCenter = 2; % Define the y-coordinate for the center of a circle
r = 3; % Define the radius of the circle
col = 'black'; % Define the desired color to be utilized for the
 filling of the circle
fig_num = 2; % Define the figure that the user wishes to be utilized
 for the plotting
% Call the circleplot function to plot the circle and receive a
 "pointer"
% to the plot as a return variable
h2 = circleplot(xCenter,yCenter,r,col,fig_num);

% Second plot of a circle
xCenter = -1; % Define the x-coordinate for the center of a circle
yCenter = -2; % Define the y-coordinate for the center of a circle
r = 6; % Define the radius of the circle
col = 'red'; % Define the desired color to be utilized for the filling
 of the circle
fig_num = 3; % Define the figure that the user wishes to be utilized
 for the plotting
% Call the circleplot function to plot the circle and receive a
 "pointer"
% to the plot as a return variable
h3 = circleplot(xCenter,yCenter,r,col,fig_num);
```

```
hold off;
```


Example of “circleplot” Function
Center Coordinates: (1, 2) - Radius: 3 - Fill Color: black
Circle filled with color
Center of Circle
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-2
-1
0
1
2
3
4

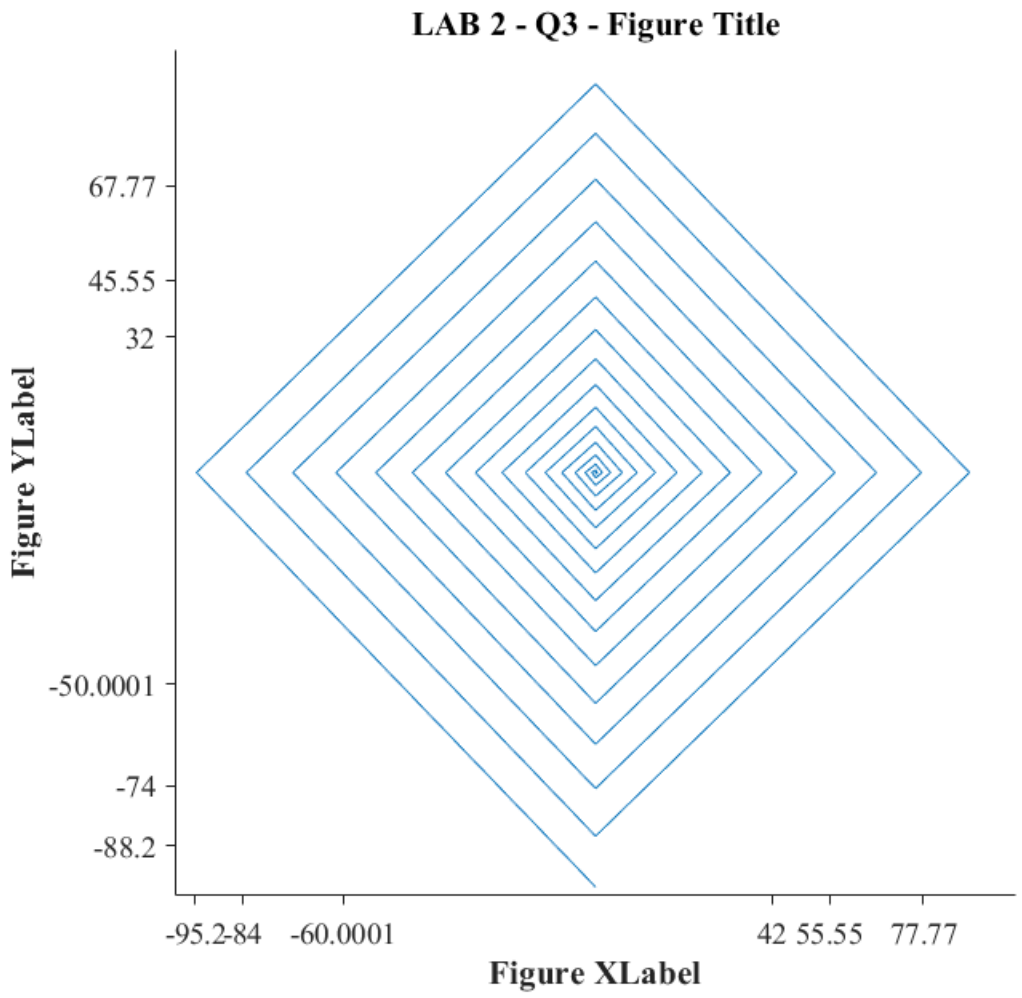


Q3 - Make a Plot

Make a plot of your choosing. Then, using set and get commands, do the changes described below.

```
fig3 = figure(4); % Create a new figure
t = 0:pi/2:100; % Time vector utilized for the plot
r = t.^2/100; % Second variable utilized for the plot
[x,y] = pol2cart(t,r); % Transforms corresponding elements of the
 polar coordinate arrays theta and rho to two-dimensional Cartesian,
 or xy, coordinates.
plot(x,y) % Plot a spiral square (why not?)
g1 = get(gcf); % Store the result of the get function so that we don't
 call it everytime
g2 = get(gca); % Store the result of the get function so that we don't
 call it everytime

% Increase the figure window width and height to something larger than
 default
set(gcf,'position',[680 300 700 650])
%Default was [680   558   560   420]

% Change the figure Color to [1 1 1] (white)
set(gcf,'color',[1 1 1])

% Change the XTicks to something other than what they were
set(gca,'XTick',[-95.2 -84 -60.0001 42 55.55 77.77])
```

```
% Change the YTicks to something other than what they were
set(gca,'YTick',[-88.2 -74 -50.0001 32 45.55 67.77])

% Change FontSize of tick labels on the x-and y-axis to 14 pt. (i.e.
 xticklabel)
set(gca,'Fontsize',14)

% Change the FontName to Times New Roman
set(gca,'Fontname','Times New Roman')

% Change the tick direction to out
set(gca,'TickDir','out')

% Add a title, xlabel and ylabel. Make them bold and FontSize 16
set(g2.Title,'string','LAB 2 - Q3 - Figure
 Title','FontWeight','bold','FontSize',16)
set(g2.XLabel,'string','Figure
 XLabel','FontWeight','bold','FontSize',16)
set(g2.YLabel,'string','Figure
 YLabel','FontWeight','bold','FontSize',16)

% Turn the box off (must do this last!)
set(gca,'Box','off')

% Save(print)the figure to a folder other than the current folder
 WITHOUT
% changing the current folder you are in.  That is, save to a new
 folder in
% the actual save call using the full filepathname
print(fig3,'C:\Users\chryskar\Desktop\lab_3_Q3','-dpng')
```



Published with MATLAB® R2019b