

# CS1112 Spring 2011 Project 3 Part 1    due Thursday 3/10 at 11pm

(Part 2 will appear in a separate document. Both parts have the same submission deadline.)

You must work either on your own or with one partner. If you work with a partner you must first register as a group in CMS and then submit your work as a group. *Adhere to the Code of Academic Integrity.* For a group, “you” below refers to “your group.” You may discuss background issues and general strategies with others, but the work that you submit must be your own. In particular, you may discuss general ideas with others but you may not work out the detailed solutions with others. It is not OK for you to see or hear another student’s code and it is certainly not OK to copy code from another person or from published/Internet sources. If you feel that you cannot complete the assignment on your own, seek help from the course staff.

## Objectives

Completing this project will solidify your understanding of user-defined functions and vectors. Part 1 focuses on user-defined functions and graphics; Part 2 additionally involves vectors.



## 1 The Flag of Turkey

Complete Problem **P5.3.11** in *Insight* (page 127). Be sure to read *Insight* §5.3 first—it’ll help you with this problem!

### How to start

1. Download the m-files `DrawRect.m` and `DrawStar.m` from the *Insights* page of the course website and `DrawDisk.m` from the *Lecture Materials* page. Study them to make sure that you know how they work. These functions draw the specified shape with a black outline. In order to draw the flag of Turkey, you need to modify these functions to draw the colored shapes without a black outline. This can be done simply by modifying the last statement in each file, which calls the built-in function `fill`, to be

```
fill(x,y,c,'line','none')
```

Do this for `DrawRect` and `DrawDisk` and change the function names (and therefore filenames) to be `DrawRectNoLine` and `DrawDiskNoLine`. You will deal with `DrawStar` separately.

2. Modify `DrawStar` and save it as the function `DrawRotatedStar`. The original `DrawStar` draws a 5-pointed star that has one star tip due North and has this specification:

```
function DrawStar(xc,yc,r,c)
% Adds a 5-pointed star to the current window.
% Assumes hold is on.
% The star has radius r, center (xc,yc) and color c where c is either an rgb vector
% or one of the built-in colors 'r', 'g', 'y', 'b', 'w', 'k', 'c', or 'm'.
```

Your function `DrawRotatedStar` should have a fifth parameter for the “clock point” expressed in radians. Be sure to (re)write the function header and comments to match your function. For example, the command `DrawRotatedStar(0,0,1,'y',pi/2)` should draw the same star produced by the command `DrawStar(0,0,1,'y')`. Finally, revise the function call to `fill` to exclude the black outline.

3. To draw the flag of Turkey, search for the flag specification on the Internet. For example, Wikipedia gives the specs clearly, with all the measurements in terms of  $G$ , the width of the flag. Follow good programming style by naming all parameters. Your script `FlagOfTurkey` sets up the figure window *and* draws the flag by calling your functions `DrawRotatedStar`, `DrawRectNoLine`, and `DrawDiskNoLine`. Don’t be concerned about the slight difference between the star on the flag of Turkey and our star, but do make sure that there is a star tip due West when you draw the flag.

Submit your files `DrawRotatedStar.m` and `FlagOfTurkey.m` only. We will use our versions of `DrawRectNoLine` and `DrawDiskNoLine` when we test your code.