15-102 Exploring Programming with Graphics	**Start:** Mon 5.2311
Homework 4	**Due:** Wed 5.25.11
	Goal: **Functions** theirs and yours

Course Web Site:
www.andrew.cmu.edu/course/15-100mooseNsquirrel

Reading:
As posted on the calendar web page available from the link shown above.

Assignment:
You will work with functions in this homework – the usual ones from Processing and three functions that you will define. Two of these functions, **setup(),** and **draw)** are called by Processing if they are present in your code. The third function will be called by your code.

Specifications

1. _____Make a copy of your Homework2 folder and rename it Homework4. This is so you can reuse your code that draws your initials. There is no reason to recode homework 2 unless you want to.

2. _____Rename the .pde file in the folder to match the folder name as required by Processing.

3. _____In your code add a function definition for a **setup( )** function. This function must have a **void** return type and have no arguments.   The **setup( )** function must call the **size(int, int)** function of the window **first.**   Next, it should color the background. Processing automatically calls the **setup( )** function first if it is present in your code. *Refer to the class code for today.*

4. _____In your code add a function definition for a **draw( )** function. This function must have a **void** return type and have no arguments. Processing automatically calls the **draw( )** function second (after calling **setup( )**)[1] .   The last two lines of code in the **draw( )** function definition (before the closing **}**) must be:

   ```
        saveFrame( "hw4.jpg" );
        noLoop( );  // this will also be explained in a day or two
      }
   ```

5. _____Type in the first line or header line of a function named **drawInitials**. This function must have a **void** return type. It will need at least three arguments and possibly four depending on how you drew your initials in homework #2. Your code should look something like this:

   ```
     void drawInitials( float x, float y, float wd, float ht )
      {
      }
   ```

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[1] This is not completely true. The "total" truth will be revealed next week – stay tuned…

You must use arguments names that are the same as the variable names you used for homework #2. You do not have to use the names **x**, **y**, **wd** and **ht** if you did not use them in that homework.
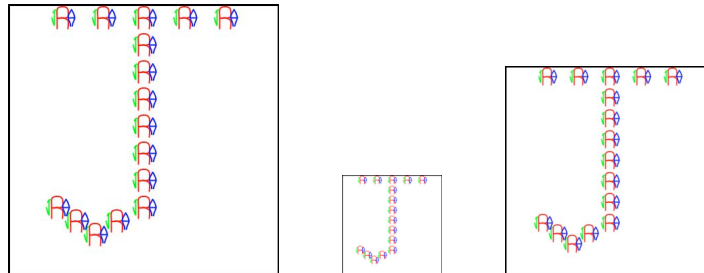
6. Copy only the code you wrote for homework #2 that colors and draws your initials and paste it inside the braces of the function definition of **drawInitial(float, float, float, float)** you added in specification #5.

7. Find and delete the variable declarations and assignments from Homework #2 These old variables are being replaced by the arguments in the **drawInitials(float, float, float,float)** function definition's parentheses.

8. _____ Go back to the function definition for **draw( )**. Add multiple calls of your **drawInitials(float, float, float, float)** function so the program displays one of your initials on the screen. The choice of initial is up to you as long as you make the display "interesting." See the example below. Your big initial must be centered in the window and cover much of the window. **DO NOT HARDWIRE** the arguments in your calls of **drawInitials(float, float, float, float)**. You have to use expressions that involve the **width** and **height** of the window to position each set of initials so your large initial grows and shrinks as the size of the window changes. This is how your code will be graded. The overall location of your initials will not be altered. See the sample below for examples.

Handin:
Follow the directions on the link on the course web page <u>Handing in Your Homeworks</u> exactly as they are written. You want to try and have the applet version of this on your web page in two days.

Sample:
Another of Jim's attempt at being "*artistic*" is on the next page… Each image is the result of calling Jim's **drawInitials(float, float, float)** function 16 times by the function **draw()**. Each call of **drawInitials(float, float, float)** has different arguments for the **x** and **y** coordinates to position the initials in the appropriate place to form the large "J". These arguments use expressions that involve the width and height of the window. Note how the initials grows and shrinks when the window size is changed.

Very Special Note

The main point of this homework requires you to define your own function. In doing this you must understand the words being used:

function
function call
function definition
argument (or parameter)
header
return type
void
signature
body
brace

AND you must understand what we are calling **argument binding** – which means you need to understand **what** (**NOT WHY**) happens when your code tells processing to execute this function with the arguments:

drawIntials(width*.1, height*.2, width*.05, height*.03);

How does the **drawIntials** function "know" where to draw your initials?
How can the **drawIntials** function draw the initials with different sizes?

We do this sort of stuff for the rest of the course. Understanding the answers to these three questions is a major foundation block to doing well in this class. Please work with us until you are comfortable with what is happening here.