**Midterm Exam (Begin Wed 3/24; Due Friday 3/26 by 11:30<u>am</u>; 100 pts total)**
**CSCI 3353 - Hibbs**

<u>*Instructions:*</u> There are 4 practical coding questions for this exam. Each question asks you to create a Processing sketch to achieve the goal specified. You may consult the textbook, notes, slides, posted code, and the broader internet during the exam. However, you must not communicate about the exam with any other students, friends, family, strangers, chat rooms, stack overflow, or anyone else other than me (This is an open-book, open-note, open-internet, closed-people exam). For each question, create an archive of your solution with this naming convention: **mid_q#_username.zip (PLEASE USE THIS CONVENTION)** When done, upload all of your sketch archives into the google classroom assignment, and select the "Turn In" button to indicate your completion.

Q1 (20 pts) - Create a sketch that draws a series of points that outline an ellipse centered in the middle of a window. The points should be large enough to easily see, and far enough apart to easily distinguish. The ellipse's major axis should be twice the length of the ellipse's minor axis. The major axis should be oriented at a 30° angle above horizontal on the right hand side. The points used to draw the ellipse should smoothly transition from red in the lower-lefthand corner to blue in the upper-righthand corner (through purple in the middle). Your sketch should produce a picture similar to that below:
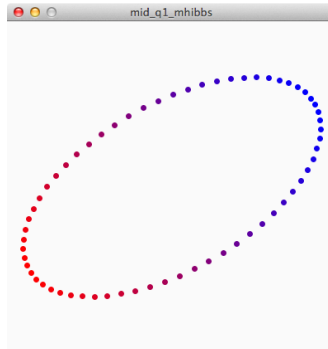
Q2 (20 pts) - Create a sketch that draws a fractal series of circles, where each circle contains 5 smaller circles that each barely touch each other and the containing circle (each circle meets at 1 point). Your result should approximate the image below:
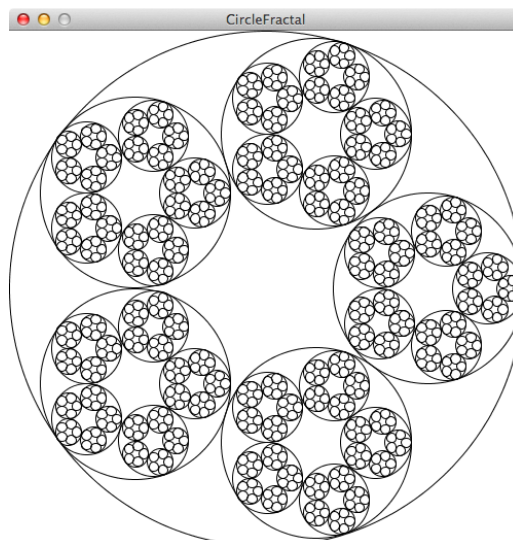
Q3 (30 pts) - Create a sketch in the style of the famous Piet Mondrian paintings shown below. Your sketch should be nondeterministic, in that every time it is run _AND every time a key is pressed_, a different set of lines and colored rectangles should be drawn. Note that Mondrian rarely constructs an entire, regular grid; rather, horizontal and vertical lines create regions that may or may not be subdivided further. Full credit includes (but is not limited to) requirements that the result is not a simple, regular grid of rectangles; that the filled rectangles not overlap with one another; and that a limited color palette is used for colors (not necessarily red/yellow/blue/black/white, but some limited palette).
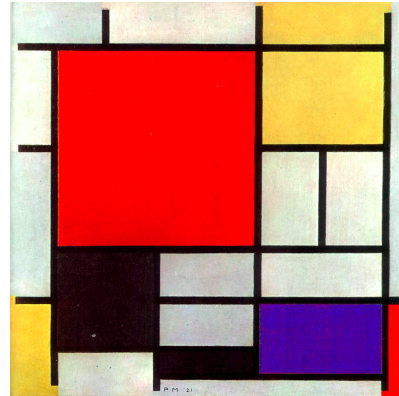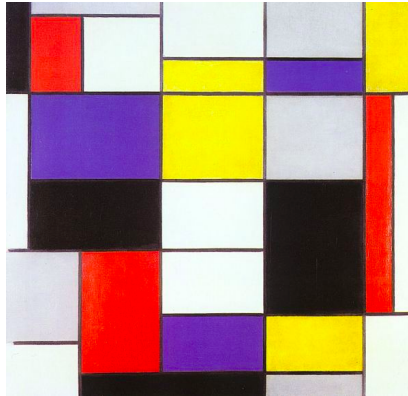
Q4 (30 pts) - Create a Processing sketch to visualize this data file (containing the homicide rates per 100,000 people for 89 different countries from 2001 to 2009) using a parallel coordinates plot, similar to the image below. The data is in a tab-delimited plain text format. The 1st line is a header row. The 1st column contains the name of the country, the 2nd contains the geographical region of the country (which you can ignore), and the remaining columns contain the homicide rates for each year. Include the data file in your archive, such that it can be run immediately on decompressing. Full credit requires labels for the years, rates, and a title for the visualization.