Graphics

Computer Graphics vs. Graphic Design

- **Computer Graphics is not using Photoshop- it's learning how to MAKE Photoshop.**
- **Within CS, computer graphics is the study of how to make a computer render images.**
- **We usually focus on 3D images, but it also encompasses 2D image processing.**
- **It involves a lot of code, and a lot of math (particularly geometry and matrix algebra), but the rewards are worth it.**

Some applications of graphics

- Cinematic CG
- Animation & Scientific Modeling
- Video games
- Photorealistic image rendering
- Image editing tools
- Java Applets

Cinematic CG

Video Games

Animation and Scientific Modeling

http://www.youtube.com/watch?v=E37Ss9Tm36c

Photorealistic Images

Image editing tools

Java Applets/Applications

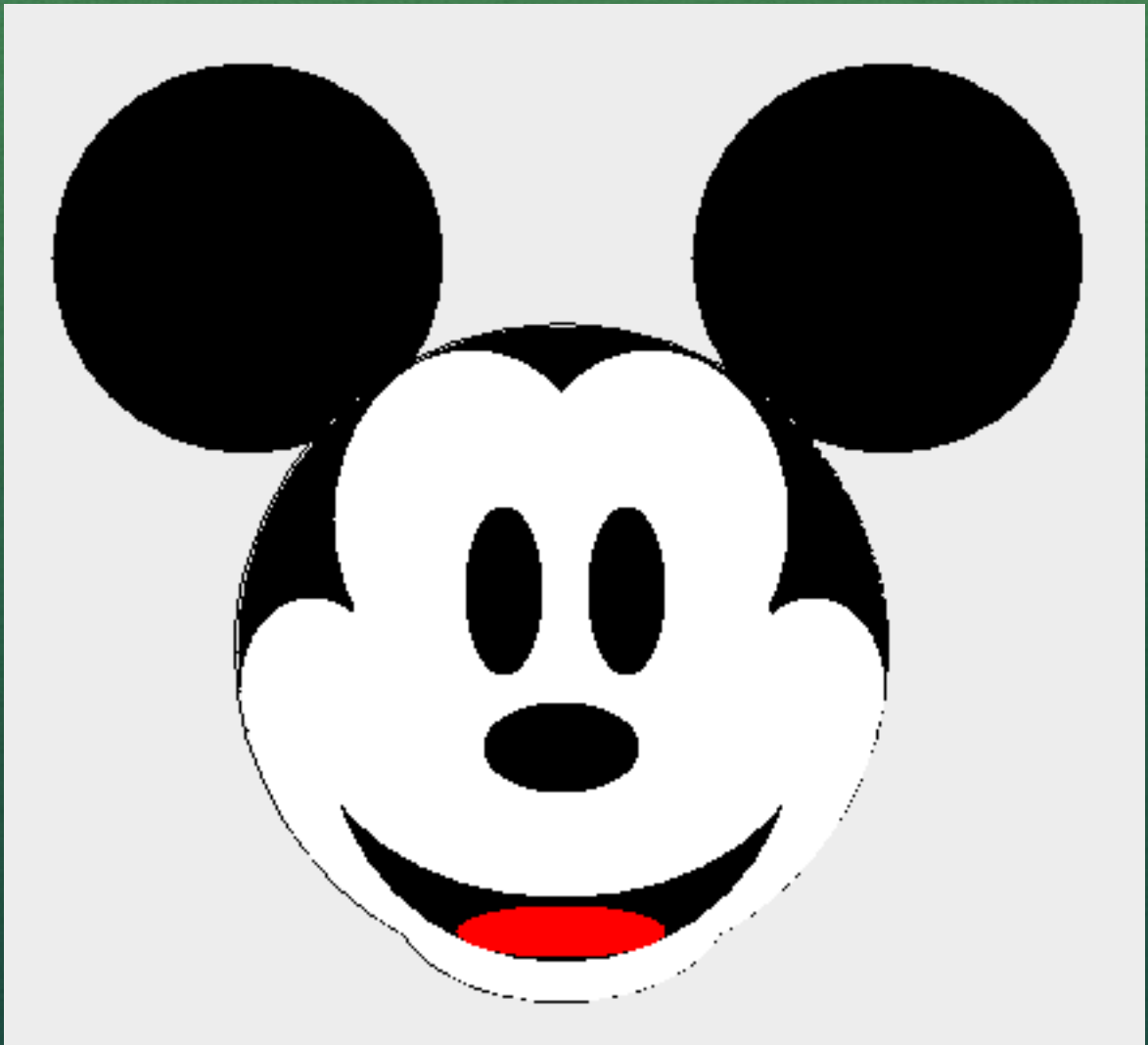
- Most of the really cool stuff you can do with Graphics requires a very solid background
- One of the more basic forms of graphics that you can do is in Java applets and applications.
- Many times when writing an applet, you'll want to include graphics or animations that the user can interact with (such as an interactive chess game)

Java's Graphics Package

- If you've never programmed in Java before, don't worry about it! We've provided and explained all the commands that you will need to know for this project.

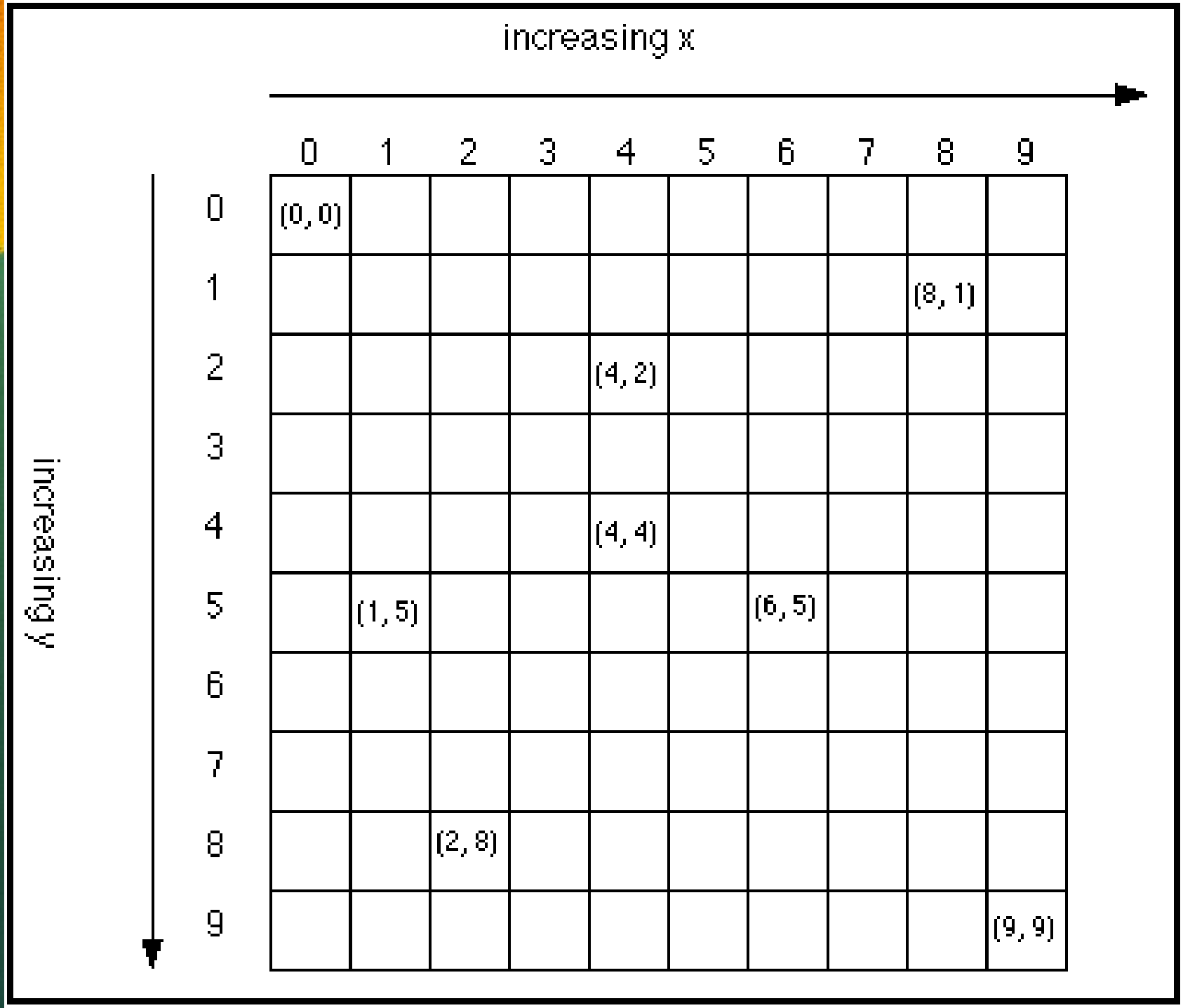
- Ignore most of the code- All of the code that you add to draw the graphics will be placed in the paint method.

Your objective



The coordinate system

- When you specify where to draw an element, you are telling the computer the pixel locations of where you want to put the shape.
- The upper left hand corner is the origin, (0,0).
- The x axis increases as you go across
- The y axis increases as you go down.


increasing x
0 1 2 3 4 5 6 7 8 9
increasing y
0
1
2
3
4
5
6
7
8
9
(0, 0)
(8, 1)
(4, 2)
(4, 4)
(1, 5)
(6, 5)
(2, 8)
(9, 9)

startX and startY

- For your convenience, we included the startX and startY variables to serve as an easier reference point for you to use.
- So instead of going through the trouble to specify the exact pixel coordinates, you can just say startX+___ and startY+____
- Both have been initialized to 250. Feel free to change these or not use them at all.

g.setColor(Color.BLACK);

- Use this command whenever you want to change colors. The next items you draw will be in that color until you change the color again.
- If you wanted to change the color to blue, you would type g.setColor(Color.BLUE);
- Or for red, g.setColor(Color.RED);
- And so on. Note that the name of the color must be in all capitals

g.fillOval

- Draws an oval (or circle) and colors it in.
- FORMAT: g.fillOval(xposition, yposition, width, height). All in units of pixels.
- A circle is just an oval where width = height
- Sample: g.fillOval(startX+5, startY+5, 30 ,30);

g.fillArc

- Draws and colors in an arc. Think of a pie chart
- FORMAT:
- g.fillArc(xposition, yposition, width, height, startAngle, arcAngle)
- startAngle = the beginning angle
- arcAngle = the extent of the arc, relative to the beginning angle.

If you finish early…

Feel free to add to your picture or even make a new one!

There are many more Java graphics tools you can use.

This site lists and explains all of them.

http://download.oracle.com/javase/1.4.2/docs/api/java/awt/Graphics.html