

Program Structure Recap (Active Sketch)

```
// declare variables
void setup () {           // ...stuff to do once at the beginning goes here...
  // open window
  // initialize variables
}
void draw () {           // ...stuff to do for each frame goes here...
  // draw frame
  // update variables
}
```

Variable Recap

- declaring variables

```
type name;           // where type is the type of the variable and
                    // name is its name
```

- types

```
int                 // whole number
float               // numbers with decimal points
boolean            // true or false
```

- assignment statements – for initialization and update

```
name = value;      // where name is the name of the variable whose
                    // value is to be set, and value is the new value
                    // (value can be a literal or an expression)
```

Animation and Variable Questions

- what changes from one frame to the next? → one variable for each thing
- for each variable –
 - what kind of value? → type for declaration
 - where does the thing start? → initialization
 - how does the value change from one frame to the next? → update

At the End of Class

Hand in whatever you have done during class, even if a sketch is incomplete.

- Make sure each sketch is named as directed and has a comment with the names of your group. Also be sure to save your sketches! (in Linux, this should be in your sketchbook **~/cs120/sketchbook**)
- Copy the entire directory for each sketch (not only the .pde file) into your handin directory (**/classes/cs120/handin/username**). You only need to hand in one copy for the group. (If you are running Processing on your computer instead of using the Linux virtual desktop, you will need to use FileZilla to copy the sketches.)

Exercises

1. Create a sketch where a circle starts in the lower left corner of the window and moves diagonally up and right.

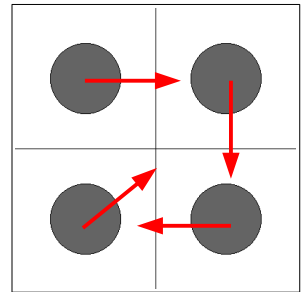
Include a comment with the names of your group at the beginning of the sketch. Save your sketch with the name **sketch_240909a**.

2. Modify the sketch so the circle starts with a width and height of 1, and grows as it moves.

3. Modify the sketch so the circle starts filled in black (with a black outline) and then gradually gets redder so that by the time the circle reaches the upper right corner of the window, it is completely red.

4. Create a new sketch which has the pattern of circles and lines shown, then animate the circles so that they move in the directions shown by the arrows. (You don't need to draw the arrows or the box around the outside.) Make the drawing window 600x600.

Include a comment with the names of your group at the beginning of the sketch. Save your sketch with the name **sketch_240909b**.



If you have time, try the following –

- Save a copy of your sketch from #3 as **sketch_240909c**, then modify it so the circle starts filled in white and then becomes redder as it moves.
- The following statements draw the car shown:

```
rectMode(CENTER);  
ellipseMode(CENTER);  
  
fill(255, 0, 0);  
stroke(255, 0, 0);  
rect(100, 285, 60, 20);  
rect(100, 270, 30, 10);  
fill(0);  
stroke(0);  
ellipse(80, 295, 15, 15);  
ellipse(120, 295, 15, 15);
```



Create a new sketch named **sketch_240909d** which draws a car, then animate it so it drives off towards the right side of the screen. What variable(s) do you need? Can you do it with just one variable? Implement your solution.

If you still have time, try the following –

- Have the car gain speed as it moves.
- Have the car shrink in size as it moves.