Program Structure – Active Mode

```
void setup () {
  // open window
  // ...stuff to do once at the beginning goes here...
}

void draw () {
  // ...stuff to do for each frame goes here...
}
```

Interaction

- system variables

```
mouseX                // current x coordinate of mouse
mouseY                // current y coordinate of mouse
pmouseX               // previous x coordinate of mouse
pmouseY               // previous y coordinate of mouse
```

- event handlers

```
void mouseClicked () {
  // ...stuff to do when the mouse is clicked goes here...
}

void keyPressed () {
  // ...stuff to do when a key is pressed goes here...
}
```

(Selected) Drawing Command Recap

```
size(width,height);
```

- drawing commands – draw something on the screen
  - `background(gray);`
  - `background(r,g,b);`
  - `line(x1,y1,x2,y2);`
  - `rect(x,y,w,h);`
  - `ellipse(x,y,w,h);`
- "other aspects" - set modes that affect subsequent drawing commands

```
stroke(gray);
stroke(r,g,b);

fill(gray);
fill(r,g,b);

rectMode(CORNER);
ellipseMode(CORNER);

rectMode(CENTER);
ellipseMode(CENTER);
```

At the End of Class

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

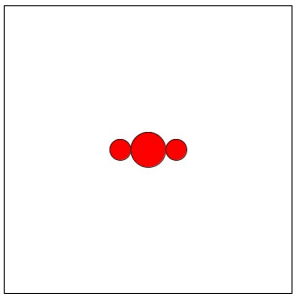
- Make sure each sketch is named as directed and has a comment with the names of your group. Also be sure to save your sketches! (in Linux, this should be in your sketchbook **~/cs120/sketchbook**)
- Copy the entire directory for each sketch (not only the `.pde` file) into your handin directory (**/classes/cs120/handin/*username***). 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. Paste the contents of the three circles example (from the schedule page) into a new sketch and save it with the name **sketch_240904a**.

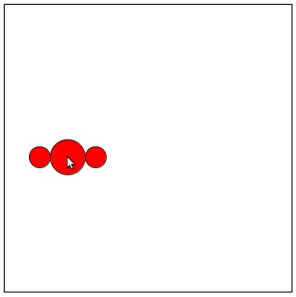
   (This code opens a 400x400 drawing window and draws the three-circle pattern shown. The box around the outside of the picture is just showing the edges of the window – it's not drawn by the sketch.)

   Convert the sketch to active mode – add the `setup()` and `draw()` functions and rearrange the existing statements accordingly. Run the sketch to verify that it still looks like the picture shown.

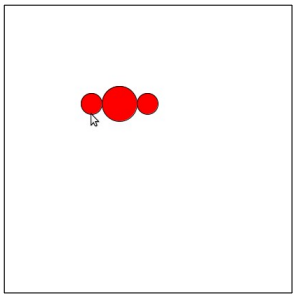


2. Modify the sketch so the circles follow the mouse around – the middle of the larger circle should track the mouse as shown by the position of the pointer in the picture.

   Hint: you will now need *expressions* for the centers of the smaller circles so that they also follow the mouse but offset from the mouse position.

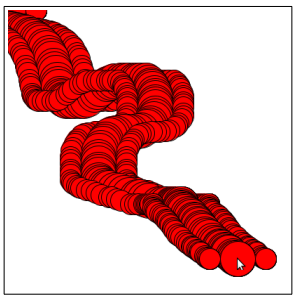


3. Save a copy of your sketch (make sure the sketch is saved, then File→Save As...) as **sketch_240904b**, then modify this copy so that the bottom edge of the left circle tracks the mouse as shown by the position of the pointer in the picture.

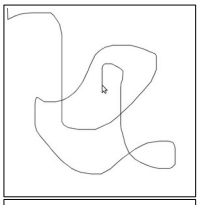


4. Return to your sketch from #2 and save another copy of it as **sketch_240904c**, then modify the copy so that moving the mouse leaves a trail of circle patterns behind.

   (Hint: you should only need to move a single statement in your sketch from #2 to accomplish this. Think about the role of `setup()` vs `draw()` and what the statements in each accomplish.)



5. Modify the sketch so that clicking the mouse clears the background.



If you have time, try the following –

- Create a new sketch which traces out a line that follows the mouse. Each new line segment should connect the previous mouse position to the current mouse position. Save your sketch with the name **sketch_240904d**.
- Create a new sketch with a rectangle whose upper left corner is in the center of the drawing window and whose opposite corner tracks the mouse as shown by the position of the pointer in the picture. (The upper left corner should stay put; moving the mouse should stretch or squash the rectangle.) Save your sketch with the name **sketch_240904e**.
- Create a new sketch with a rectangle centered in the drawing window and whose corner tracks the mouse as shown by the position of the pointer in the picture. (The rectangle should stay centered; moving the mouse should stretch or squash the rectangle.) Save your sketch with the name **sketch_240904f**.