

Loop Questions

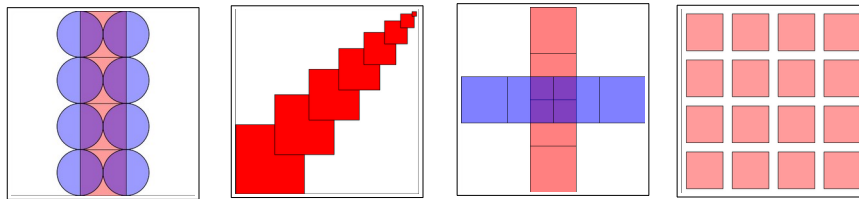
- What is repeated? → loop body
- What changes from one repetition to the next? → loop variables
- How do we start? → initialization of loop variables
- How do things change? → update of loop variables
- When do we keep going? → loop condition (involves one or more loop variables, or a counting loop)

'For' Loop Syntax Recap

```
for ( declare and initialize loop variables ; loop condition ;  
      update loop variables ) {  
    loop body  
}
```

Identifying Loops

- single loop with a single loop variable – only one pattern of repetition and only one thing changes from one repetition to the next
- single loop with multiple loop variables – only one pattern of repetition but multiple things change from one repetition to the next
- multiple loops, one after another – multiple patterns of repetition
- nested loops – often a grid pattern; multiple things change but not at the same time
→ solution is to view the repetition in two stages - “what repeats? - drawing a whole row (or column) of things”, then go through the loop questions again for one row (or column)



- loop + animation – when there is repetition in a single snapshot, and also something that changes over time

At the End of Class

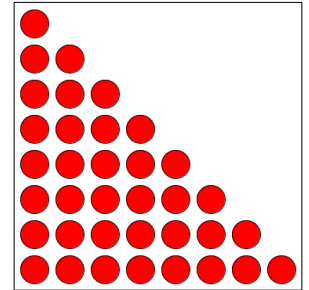
Hand in whatever you have done during class, even if a sketch is incomplete.

- 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.)

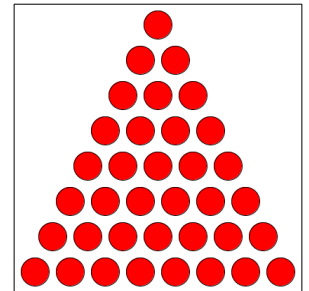
Exercises

For all sketches, be sure to **include a comment with the names of your group at the beginning of the sketch.**

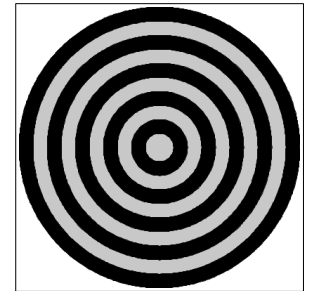
1. Create a new sketch called **sketch_241028a** which draws the picture shown.



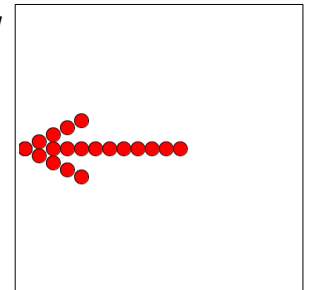
2. Save a copy of your previous sketch as **sketch_241028b**, then modify it to draw the picture shown.



3. Create a new sketch called **sketch_241028c** which draws the picture shown.



4. Create a new sketch called **sketch_241028d** which draws the arrow shown, then have the arrow follow the mouse around. The tip of the arrow should be at the mouse position. Use the solution for #2 in the in-class exercises from 10/23 posted on the schedule page as a starting point.



If you have time –

- Save a copy of your sketch from #2 as **sketch_241028e**, then modify it so that the whole pattern moves to the right.
- Save a copy of your sketch from #2 as **sketch_241028f**, then modify it to animate the transition between the picture from #1 and the picture from #2 – that is, the first frame should look like the picture from #1 and then the pattern should shift so that it eventually looks like the picture from #2. The animation should continue until the top circle reaches the right side of the window (so the pattern looks like a mirror image of #1) and then reset.