Names: _____

Constant Motion

What changes? – position

- position = position + speed

Speed is a constant (e.g. 1).

Random Numbers

- `random(low,high)` – generates `float` value between `low` and `high`

Acceleration/Deceleration

What changes? – both position and speed

- position = position + speed
- speed = speed + acceleration

To speed up, acceleration is in the same direction as speed (same sign).

To slow down, acceleration is in the opposite direction as speed (opposite sign).

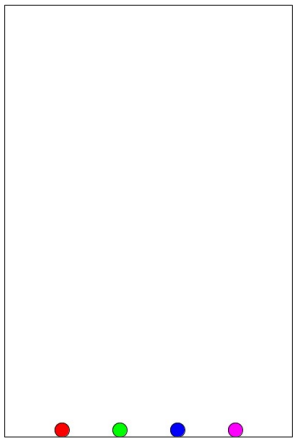
At the End of Class

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! (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.

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 sketch named **sketch_250922a** containing four small circles (red, green, blue, magenta). Make the drawing window taller than it is wide. The circles should start in the positions shown (just touching the bottom of the window, evenly spaced across the width of the window) and then move as described:
   - the red (left) circle moves upward at a constant speed
   - the green (left middle) circles moves (only) upward with a random speed
   - the blue (right middle) circle starts at rest (not moving) and accelerates upward
   - the magenta (right) circle starts with a y speed of -10 (moving upward) and decelerates (i.e. accelerates downward)

   Before you start writing code, consider which variables are needed and fill in the table on the back of this page.

what changes?	what kind of value?	what's the starting point?	how does the value change?
y – red circle	number, likely with decimal point	bottom of the window – height minus half the circle size in CENTER mode	smaller by fixed amount (subtract 1)
y – green circle	number, likely with decimal point	bottom of the window	smaller by random amount
y – blue circle	number, likely with decimal point	bottom of the window	add the speed
y speed – blue circle	number, likely with decimal point	0 (at rest)	by a fixed amount up (subtract a small value)
y – magenta circle	number, likely with decimal point	bottom of the window	add the speed
y speed – magenta circle	number, likely with decimal point	-10	by a fixed amount down (add a small value)

2. Create a sketch named **sketch_250922b** containing a small circle which starts in the middle of the window and then moves with a random walk in both x and y.

what changes?	what kind of value?	what's the starting point?	how does the value change?

If you have time –

3. Create a sketch named **sketch_250922c** which starts with a 100x100 circle in the middle of the window. Both width and height should change according to a random walk. (Allow the dimensions to both shrink and grow.) *Identify what variables are needed and go through the rest of the animation questions (what kind of value? what's the starting point? how does the value change?) before writing code.*

If you still have time –

4. Create a sketch named **sketch_250922d** and experiment with the different patterns of change discussed, applying that change to things other than only the position (size, color). You can also experiment with non-constant acceleration/deceleration. *Identify what variables are needed and go through the rest of the animation questions (what kind of value? what's the starting point? how does the value change?) before writing code.*