CS106A Code in Place

Section 5: Animations

Week 5: May 25th, 2023

Today's plan

- Check-in
- Concept review
  - Animation 101
  - Animation Functions
- Section Problem: Scribbles

Catching-up

- Since you guys all said you liked this format, let's do a check-in question per person!

  (Feel free to answer in the chat!)

- Choose 1 of the following questions, then name someone else:

  a) What is your favourite game?

  b) What is your favourite movie?

  c) What is your favourite holiday?

Questions

Any questions before jumping into the concept review?

Concept Review

- Animations:
  - What is an animation?
  - Key Python functions

Concept Review: Animation

What is an **animation**?

- Animation is just a collection of images shown in succession.

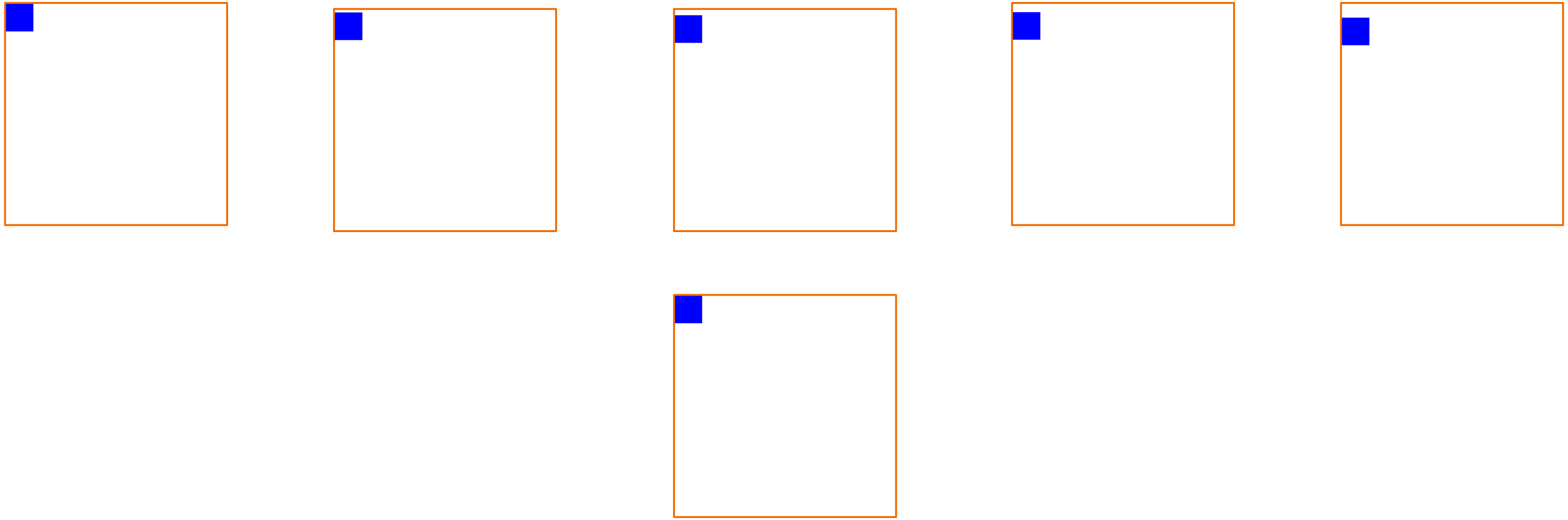
- When we strategically add delay, it looks like the things in our canvas are moving!

- Each individual image is called a “frame”.

Concept Review: Animation

Example

- Here’s five images that when shown back-to-back with a delay, makes it look like the square is moving! Can you see the individual frames?



Concept Review: Animation

The key function: `time.sleep(DELAY)`

- This function tells our program to **wait for a period of time** specified by the DELAY parameter.
- This is what lets us add the small gaps between our frames!

Concept Review: Animation

Other useful functions:

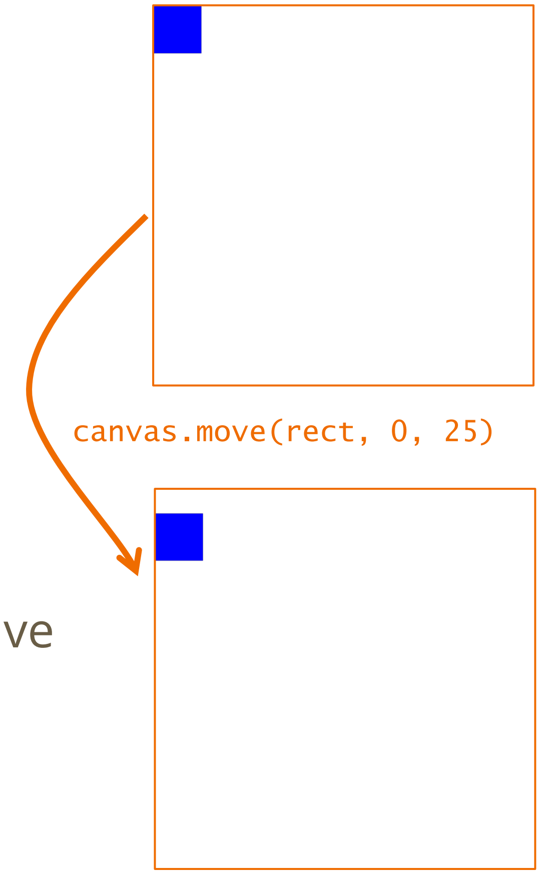
```
canvas.create_rectangle(x0, y0, x1, y1, ...)
```

- Used to make rectangles/squares.
- It’s the general format for making any shapes/images in the graphics library.

```
canvas.move(shape_var, dx, dy)
```

- We can use this to move an existing shape relative to its current location.
- dx and dy are how much we want to move left/right and up/down respectively!

```
rect = canvas.create_rectangle(0, 0, 50, 50, “BLUE”)
```



```
canvas.move(rect, 0, 25)
```

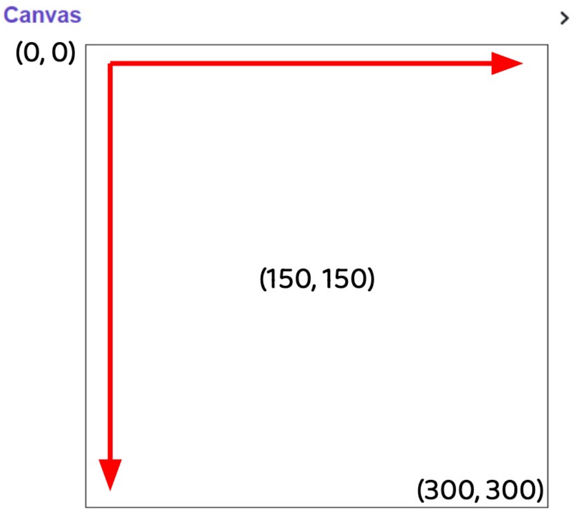
Section Problem: Scribble

Task: write a program that continuously draws circles wherever our mouse is!

Drawing Circles

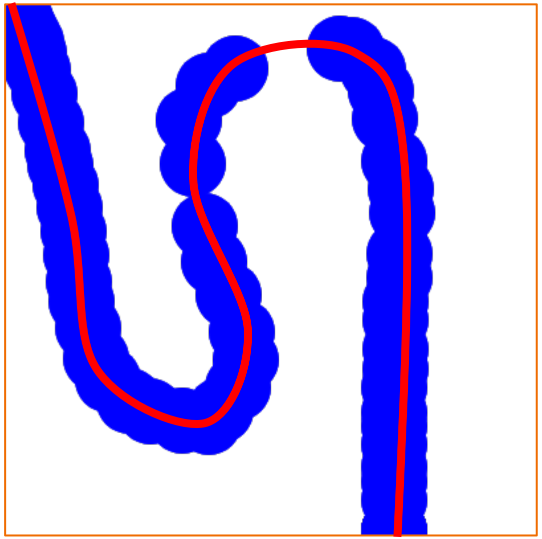
Initial state

- Our program takes in a blank canvas



Example Goal

- The red line represents the path of our cursor.



Drawing Circles

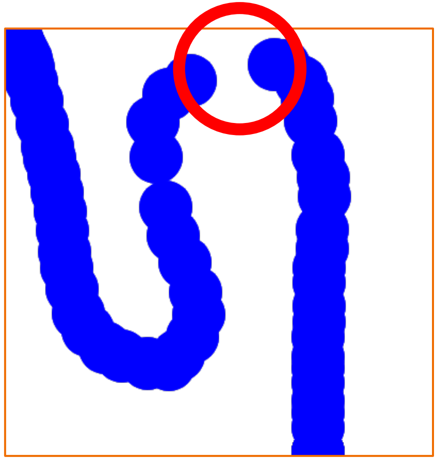
- Details:
  - The canvas width and height are provided as **CANVAS_WIDTH** and **CANVAS_HEIGHT** respectively.
  - Circles: The size for each circle is provided as **CIRCLE_SIZE**. Should be drawn with the left and top x and y values as the x and y values of the ***user's mouse***.
  - Animation: The delay between each frame is provided as **DELAY**.
- Breakout rooms to discuss approaches for 3 minutes:
  - What do we want in 1 frame?
  - How do we draw where the mouse is?

Drawing Circles: Potential Problem?

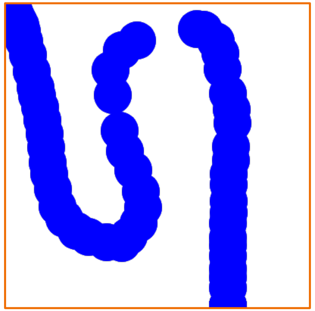
- Why might there be a gap where the red circle is?

- What might happen if we make the delay value for our time.sleep() call larger?
- What about smaller?

- With that information, which image do you think had a higher frame rate, and why?



A



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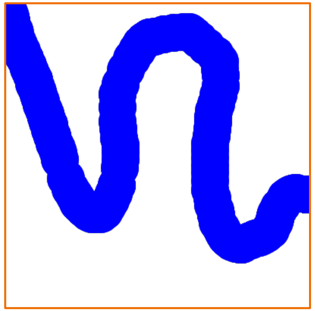

Next Section

- Last session next week!

- Will be longer as it’s the last one, and the extra time will be used to answer any questions you might have:
  - Coding
  - Python
  - Working in industry
  - Next steps

- So come up with some questions you want to ask for next time! ☺

See you next week!

Section 6: Animations

Next week: Lists & Dicts