

CS106 W20 - Lab 08

Randomness and Noise

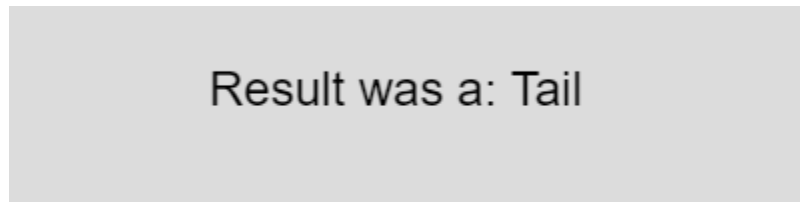
Due: Wednesday, March 4 11:59 PM

QUESTION ONE: Singles

Create a folder L08. In that folder, save your answers with the following names: L08_Q1a, Lab08_Q1b, Lab08_Q2, and Lab08_Q3.

QUESTION 1a: oneFlip

Write a function `oneFlips()`. It has no arguments and returns a value. It flips a coin and determines whether the flip is a head or a tail. It returns "head" or "tail". Running the program might result in the following canvas:

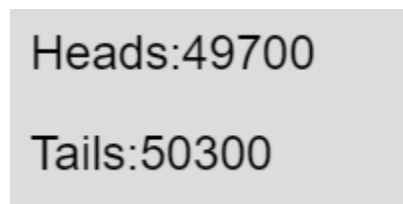


Use the following starter code:

```
function setup() {
  createCanvas(400, 100);
  background(220);
  let result = oneFlip();
  textSize(24);
  text("Result was a: " + result, width / 4, height / 2);
}
```

QUESTION 1b: manyFlips

Write a function `manyFlips(n)`. It has one argument 'n' and returns nothing. It flips a coin n times and determines whether each flip is a head or a tail. It uses `text()` to display the number of heads and tails to the canvas. So for example, `ManyFlips(1000000)` might result in the following canvas.



Use the following starter code:

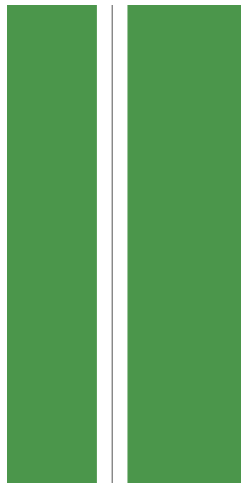
```
function setup() {
  createCanvas(200, 200);
  background(220);
  textSize(24);
  manyFlips(100000);
}
```

QUESTION 2: White Road

In your folder L08 save the answer to this question as L08_Q2

1. Create a sketch of size 400×800.
2. In the `draw()` function, give it a background colour of green. Any green colour is fine. It is meant to represent grass.
3. Next, you'll draw a white road through the green grass.
4. To draw the road, draw a horizontal one-pixel-wide white line in every row of pixels in the canvas (i.e. there are 800 rows of pixels and thus you will draw 800 white lines (in a loop)).
 - Make each horizontal white line 50 pixels long. Have the x position of the line always be 150. Your line drawing, within your loop, will be done with code something like the following “`line(150, i, 200, i);`”.
5. Put a black line down the middle of the white road (do this after the loop as you only need to draw the black line once).

Your canvas should look like the following:



Use the following Starter Code:

```
function setup() {  
  createCanvas(400, 800);  
}
```

QUESTION THREE: Driving the noise() Function

In your folder L08 save the answer to this question as L08_Q3



Create a simple driving game in which the white road is generated using (the one-dimensional version of) the `noise()` function. A video is at: <https://youtu.be/xRrKqJ29q3E> Follow these steps:

6. Create a sketch of size 400×800.
7. In the `draw()` function, give it a background colour of your choice.
8. Now draw a horizontal one-pixel-wide white line in every row of pixels in the sketch. Make the line 100 pixels long.
 - Set the x position of the horizontal as 150 pixels plus some value between 0 and 100. The code for determining x will look something like “`x = 150 + (noise(n) * 100);`” where n is a value that changes with each row. You can experiment to determine how much n should change for each row. To start, change n by 0.01 for each row. Perhaps experiment later with other values such as 0.05 or 0.001.
 - Remember that the `noise()` function produces values between 0 and 1. Thus multiplying `noise(n)` by 100 returns a number between 0 and 100.
9. Have a red ball 50 pixels from the top of the canvas. The red ball should stay exactly in the middle of the white road. (i.e. the middle of the ball is in the middle of the horizontal line).
10. Add the ability to control the X position of the ball via the left and right arrow keys. Create a `keyPressed` function with the following starter code. The left and right arrow keys move the ball 10 pixels to the left or right. (note: This is just for practice programming – there is really no need for the user to be able to control the ball.)

```
if (keyCode === LEFT_ARROW) {  
  // Change car X location here.  
} else if (keyCode === RIGHT_ARROW) {  
  // Change car X location here.  
}  
}
```

Submission

Submit all sketch directories from this lab as one ZIP file called L08.zip to the lab dropbox on Learn. It is your responsibility to submit to the correct dropbox with the correct files before the deadline. Otherwise you will receive a mark of 0.