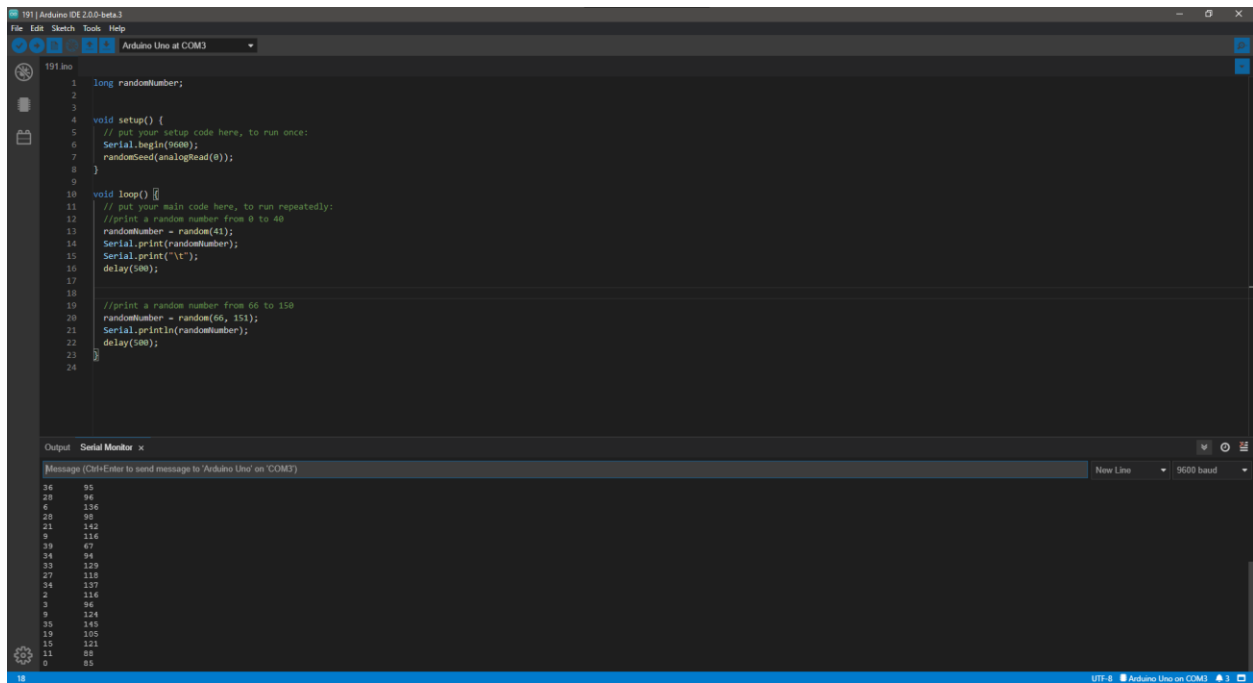


Exercise 1 rory lange



The screenshot shows the Arduino IDE interface. The top menu bar includes File, Edit, Sketch, Tools, and Help. The toolbar shows icons for opening files, saving, compiling, and uploading. The sketch is named "191.ino" and is being uploaded to an "Arduino Uno at COM3".

```
1 long randomNumber;
2
3
4 void setup() {
5   // put your setup code here, to run once:
6   Serial.begin(9600);
7   randomSeed(analogRead(0));
8 }
9
10 void loop() {
11   // put your main code here, to run repeatedly:
12   //print a random number from 0 to 40
13   randomNumber = random(41);
14   Serial.print(randomNumber);
15   Serial.print("\n");
16   delay(500);
17
18   //print a random number from 66 to 150
19   randomNumber = random(66, 151);
20   Serial.println(randomNumber);
21   delay(500);
22 }
23
24
```

The Serial Monitor window is open, showing the output of the sketch. The message "Message (Ctrl+Enter to send message to 'Arduino Uno' on 'COM3')" is displayed. The output shows a sequence of random numbers generated by the sketch, with line numbers 36 through 41 visible on the left side of the monitor.

```
36 95
37 96
38 134
39 90
40 142
41 114
```

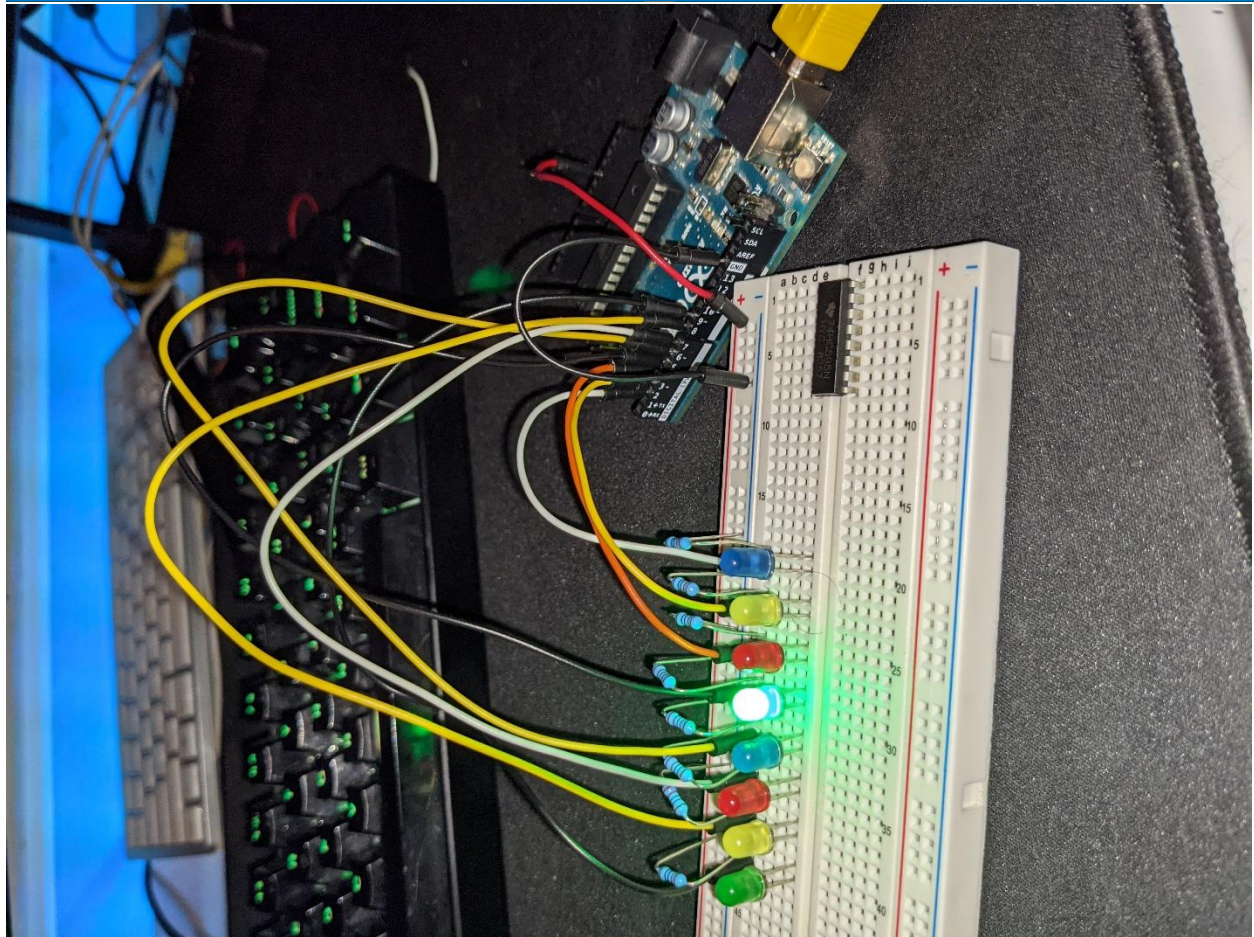
The status bar at the bottom indicates "UTF-8" encoding and "Arduino Uno on COM3".

Exercise 2

```
102 | Arduino IDE 2.0.0-beta.3
File Edit Sketch Tools Help
Arduino Uno at COM3

192 ins
1 int leds[] = {2,3,4,5,6,7,8,9};
2
3 void setup() {
4   // put your setup code here, to run once:
5   Serial.begin(9600);
6   for (int i = 0; i <= sizeof(leds); i++)
7     pinMode(leds[i], OUTPUT);
8 }
9
10 void loop() {
11   // put your main code here, to run repeatedly:
12   int i = random(8);
13   digitalWrite(leds[i], 1);
14   delay(100);
15   digitalWrite(leds[i], 0);
16   Serial.println(i);
17 }
18

Output Serial Monitor x
Message (Ctrl+Enter to send message to 'Arduino Uno' on 'COM3')
New Line 9600 baud
0
0
0
0
0
1
2
0
0
1
2
1
3
0
5
7
0
```



Exercise 3

The screenshot shows the Arduino IDE 2.0.0-beta.3 interface. The sketch is for an Arduino Uno at COM3. It contains the following code:

```
10 for (let i = 0; i < 20; i++) {
11   randomNum = random(10);
12   Serial.print(randomNum);
13   Serial.print(" ");
14 }
15 Serial.println();
16 Serial.println("print 20 random numbers between 2 and 9");
17 for (let i = 0; i < 20; i++) {
18   randomNum = random(2,10);
19   Serial.print(randomNum);
20   Serial.print(" ");
21 }
22 Serial.println();
23 randomSeed(analogRead(0));
24
25 Serial.println("print 20 random numbers between 0 and 9 after floating seed");
26 for (let i = 0; i < 20; i++) {
27   randomNum = random(10);
28   Serial.print(randomNum);
29   Serial.print(" ");
30 }
31 Serial.println();
32 Serial.println();
33
34
35 void loop() {
36   // put your main code here, to run repeatedly:
37 }
```

The serial monitor shows the output of the sketch:

```
0000000000000000 random num between 0 and 9
7 2 3 8 0 2 4 5 3 9 0 52 2 3 7 50 print 20 random numbers between 0 and 9
7 9 3 8 0 2 4 8 3 9 0 5 2 2 7 3 7 9 0 2
print 20 random numbers between 2 and 9
9 3 7 2 7 5 8 2 9 3 4 2 5 4 5 7 5 7
print 20 random numbers between 0 and 9 after floating seed
4 5 9 7 0 3 1 4 7 4 9 2 9 9 6 3 7 9 4
print 20 random numbers between 0 and 9
7 9 3 8 0 2 4 8 3 9 0 5 2 2 7 3 7 9 0 2
print 20 random numbers between 2 and 9
9 3 7 2 7 5 8 2 9 3 4 2 5 4 5 7 5 7
print 20 random numbers between 0 and 9 after floating seed
6 7 2 8 5 3 1 8 8 7 0 4 5 7 4 3 8 1 0 5
```

Ex 3 Task 2 and 3

The screenshot shows the Arduino IDE 2.0.0-beta.3 interface. The sketch is for an Arduino Uno at COM3. It contains the following code:

```
11 Serial.print(randomNum);
12 Serial.print(" ");
13 }
14 Serial.println();
15
16 Serial.println("print 50 random numbers between 25 and 65");
17 for (let i = 0; i < 50; i++) {
18   randomNum = random(25,66);
19   Serial.print(randomNum);
20   Serial.print(" ");
21 }
22 Serial.println();
23 randomSeed(analogRead(0));
24
25 Serial.println("print 35 random numbers between 36 and 94 after floating seed");
26 for (let i = 0; i < 35; i++) {
27   randomNum = random(36, 95);
28   Serial.print(randomNum);
29   Serial.print(" ");
30 }
31 Serial.println();
32 Serial.println();
33
34
35 void loop() {
36   // put your main code here, to run repeatedly:
37 }
38 }
```

The serial monitor shows the output of the sketch:

```
00000000000000000000 random num between 0 and 39
7 9 33 18 10 32 24 38 3 29 0 5 12 0 print 40 random numbers between 0 and 39
7 9 33 18 10 32 24 38 3 29 0 5 12 2 27 23 7 9 0 12 23 9 29 27 0 13 19 36 16 15 17 26 32 27 10 33 19 29 19 21
print 50 random numbers between 25 and 65
36 43 45 33 59 55 31 36 32 59 31 31 27 35 38 40 32 55 32 31 45 48 55 54 31 61 59 58 29 35 43 44 47 28 47 59 50 40 43 30 56 56 62 56 38 56 61 54 62 39
print 35 random numbers between 36 and 94 after floating seed
61 57 49 70 54 90 87 49 44 40 42 70 81 61 69 58 84 59 72 53 45 86 36 74 87 36 87 44 38 58 54 87 94 89 48
print 40 random numbers between 0 and 39
7 9 33 18 10 32 24 38 3 29 0 5 12 2 27 23 7 9 0 12 23 9 29 27 0 13 19 36 16 15 17 26 32 27 10 33 19 29 19 21
print 50 random numbers between 25 and 65
36 43 45 33 59 55 31 36 32 59 31 31 27 35 38 40 32 55 32 31 45 48 55 54 31 61 59 58 29 35 43 44 47 28 47 59 50 40 43 30 56 56 62 56 38 56 61 54 62 39
print 35 random numbers between 36 and 94 after floating seed
37 77 49 70 79 79 53 44 91 37 45 45 72 42 84 84 38 82 58 51 77 41 38 61 61 50 91 50 79 43 44 72 50 94 80
```

Exercise 4

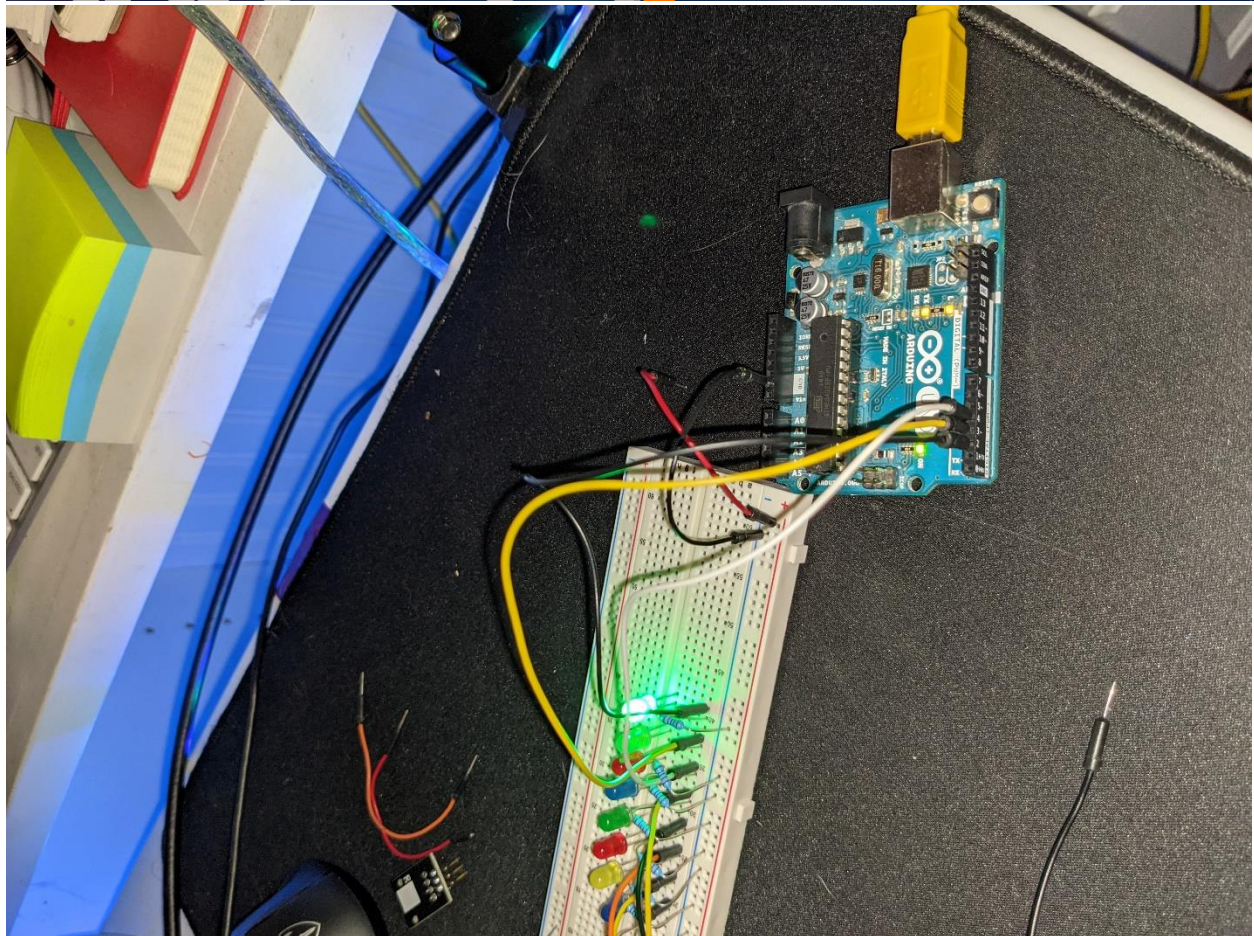

```
194 | Arduino IDE 2.0.0-beta.3
File Edit Sketch Tools Help
Arduino Uno at COM3

194.ino
1 //Declare and initialize LED pin variables
2 int LED_1 = 2;
3 int LED_2 = 3;
4 int LED_3 = 4;
5 //this variable will hold a random number generated by the random() function
6 long randomNumber;
7 void setup() {
8   Serial.begin(9600);
9   Serial.println("Starting new Random Number Sequence");
10  //set the LED pins as outputs
11  pinMode(LED_1, OUTPUT);
12  pinMode(LED_2, OUTPUT);
13  pinMode(LED_3, OUTPUT);
14  //let's make it more random
15  randomSeed(analogRead(A0));
16  void loop() {
17    //generate a random number
18    randomNumber = random(2,5);
19    Serial.print("The Random Number is - ");
20    Serial.println(randomNumber);
21    digitalWrite (randomNumber,HIGH);
22    delay(100);
23    digitalWrite (randomNumber,LOW);
24    delay(100);
25  }
26 }

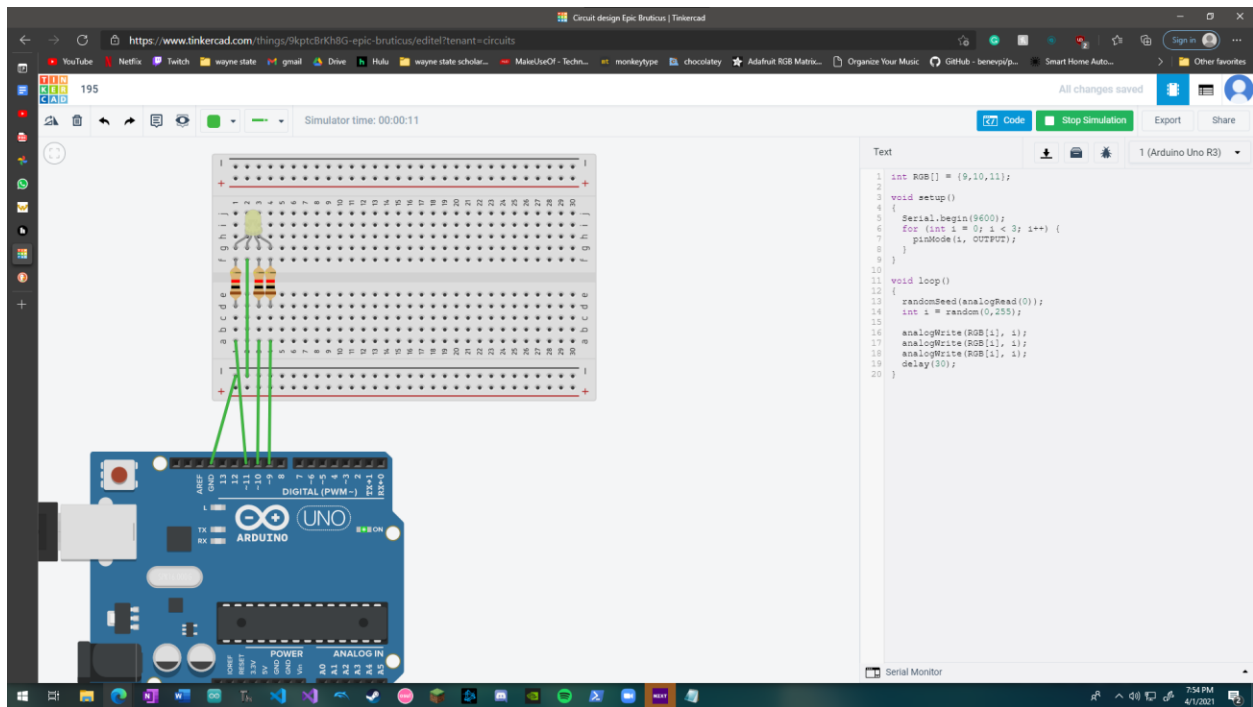
Output
Sketch uses 2892 bytes (8%) of program storage space. Maximum is 32256 bytes.
Global variables use 256 bytes (12%) of dynamic memory, leaving 1792 bytes for local variables. Maximum is 2048 bytes.

Compilation complete.

upload complete.
```



Exercise 5



Exercise 6

