

DEBUGGING AND TRACK OPTIMISATION WORKSHOP

IEEE CITY ROBOTICS SOCIETY



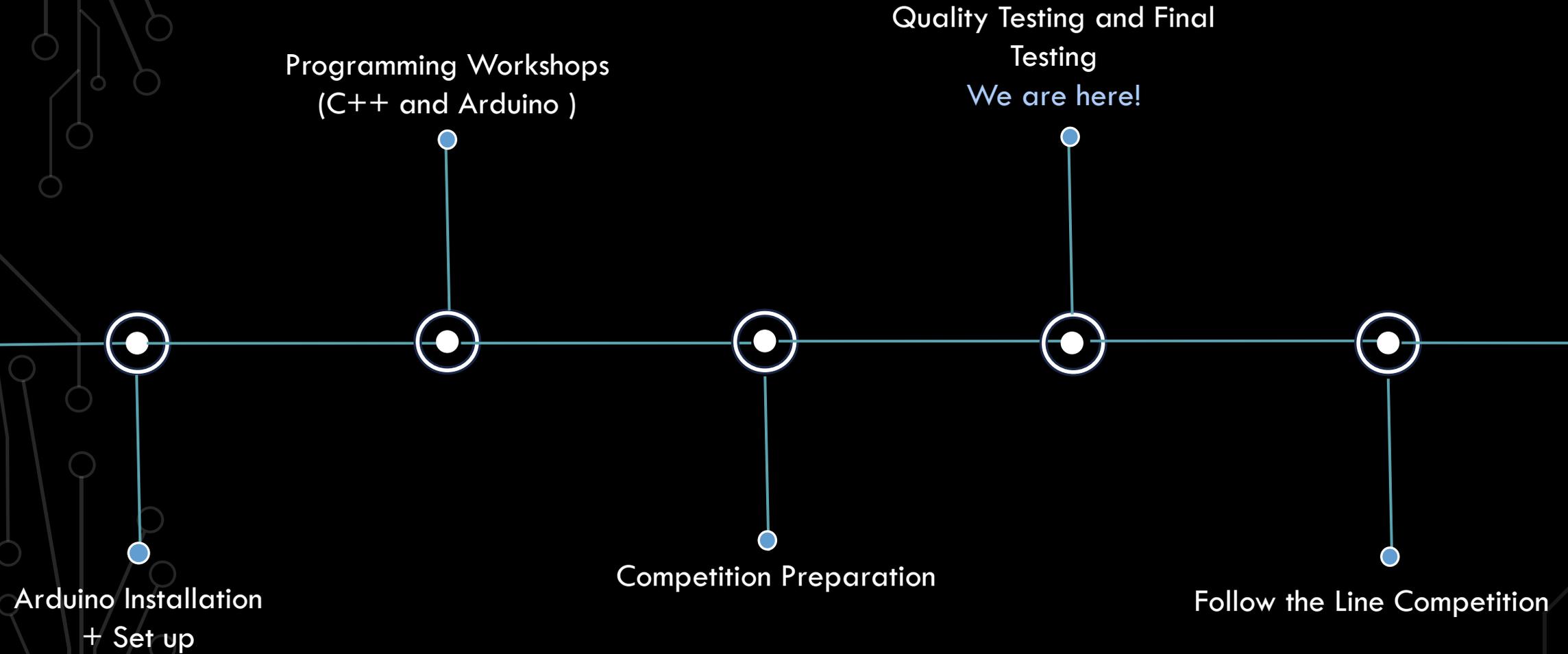
IEEE CITY
ROBOTICS SOCIETY

Today's Agenda

- Announcements
- Operators.
- Loops Recap
- Importance of Comments in Coding



Timeline for our upcoming events



ANNOUNCEMENTS

- There will be an optional workshop taking place this Friday from 3pm to 5pm in room C302.
- We will be hosting our social event after this workshop from 5:15pm to 7pm.
- If there is any social event, you want us to hold, please come and talk Fatimah (Co-President).

MORE INFORMATION ABOUT THE COMPETITION

- 16 teams will be participating in this event.
- We are going to be using a bracket system to determine the winner.
- There will initial rounds, semi-finals and then finals.
- 2 seen tracks and one unseen track.
- Top 3 will receive a trophy for their team and some other prizes.
- All participants will receive a certificate of participation though.
- Biggest Robotic Showdown of the Year!

OPERATORS WITHIN CONDITIONS OF YOUR LOOP

Conditional Operators	Syntax	Function
AND Operator	&&	Only executes if both statements are true.
OR Operator		Only needs one statement to be true for the code in the loop to execute.
NOT EQUAL Operator	!=	Only executes if that variable does not equal the other value/variable.
GREATER THAN	>	Checks if one side is greater than to the other side
LESS THAN	<	Checks if one side is less than the other side
GREATER THAN AND EQUAL TO	>=	Checks if one side is greater than or equal to the other side

LOOPS:

What are Loops?

- These are a control flow structure that allow a set of instructions to be repeated multiple times while the condition is met.

There are several types of loops:

- **For loops**
- **Do while loops**
- **While loops**
- **If Loops.**

We are only going to be doing a recap of IF Loops.

IF LOOPS WITH AND OPERATOR:

sketch_dec5a.ino

```
1  int Num1 = 20;
2  int Num2 = 5;
3  int Num3 = 10
4
5  void setup() {
6      // put your setup code here, to run once:
7
8  }
9
10 void loop() {
11     // put your main code here, to run repeatedly:
12     if(Num1 > Num2 && Num1 > Num3){
13         Serial.println("Num1 has the highest number")
14     }
15
16 }
17
```

IF LOOPS WITH OR OPERATOR:

sketch_dec5a.ino

```
1  int Num1 = 20;
2  int Num2 = 5;
3  int Num3 = 10
4
5  void setup() {
6      // put your setup code here, to run once:
7
8  }
9
10 void loop() {
11     // put your main code here, to run repeatedly:
12     if(Num1 > Num2 && Num1 > Num3){
13         Serial.println("Num1 has the highest number")
14     }
15     else if(Num1 %2==0 || Num3 %2==0){
16         Serial.println("This number is a multiple of 2 ")
17     }
18
19 }
20
```

IF LOOPS EXAMPLE WITH SENSORS:

```
int right_sensor, middle_sensor, left_sensor; //to store the values of sensors
```

```
7
8 void forward(){
9     analogWrite(ENA, carSpeed);
10    analogWrite(ENB, carSpeed);
11    digitalWrite(PhA, HIGH);
12    digitalWrite(PhB, HIGH);
13    delay(100);
14 }
15
16
17 void loop() {
18
19    //put your main code here, to run repeatedly:
20
21    if(middle_sensor >= 100 && right_sensor <= 100 && left_sensor <=100)
22        forward();
23 }
24
```

****Please note that we don't need to use the digital pins in the main loop. We only need to work with the sensor values and sensors**

COMMENTS:

What are Comments?

- These are short pieces of text within your code to help you and other people understand the code.

To write a comment in Arduino:

- Single line Comment //
- Double Line Comments /* */

FINAL GENERAL ADVICE FROM ME:

- Make sure you have the main 4 functions in your code. If any doubt, please raise your hand during the session.
- We recommend taking data readings for each of the scenarios. (E.g. dashed lines, straight lines, turning left etc.) – Find out which sensors are on at each scenario.
- Plan your strategy for both the code and the design.
- You can use if statements to achieve this.
- Use comments in your code!
- Remember there will be awards for best code, best lap time, best design and best leader.
- But most of all, remember to have fun!