Some Notes

On

Day 3: Arduino coding

By

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To

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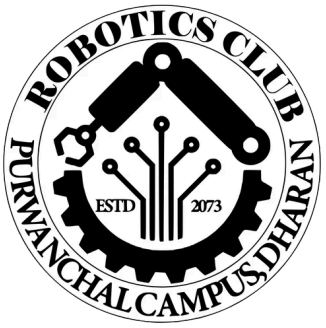

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1 Arduino Coding: Strings, Functions, and Control Structures

#Strings

In Arduino (C++), a **String** is a sequence of characters. You can create and manipulate them using the `String` class:

```
String greeting = "Hello, Arduino!";

void setup() {
  Serial.begin(9600);
  Serial.println(greeting);  // prints "Hello, Arduino!"
}

void loop() {
  // you can concatenate:
  String name = "User";
  String message = greeting + " " + name;
  Serial.println(message);
  delay(1000);
}
```

Key methods:

- `length()`: returns the number of characters.
- `substring(start, end)`: extracts part of the string.
- `toInt()`, `toFloat()`: convert to numbers.

#Functions

A **function** groups code into reusable blocks. Syntax:

```
return_type functionName(parameter_list) {
  // body
}
```

Example:

```
// blink an LED on pin 13
void blinkLED(int pin, int delayTime) {
  digitalWrite(pin, HIGH);
  delay(delayTime);
  digitalWrite(pin, LOW);
  delay(delayTime);
}

void setup() {
  pinMode(13, OUTPUT);
}

void loop() {
  blinkLED(13, 500);  // call the function
}
```

- **Return type**: `void` for no return.
- **Parameters**: inputs to the function.
- **Scope**: variables inside are local.

#Control Structures

Control structures direct the flow of execution.

`if` /`else`

```
int sensorValue = analogRead(A0);

if (sensorValue > 500) {
  Serial.println("High");
} else {
  Serial.println("Low");
}
```

`for` Loop

```
for (int i = 0; i < 10; i++) {
  Serial.println(i);
  delay(200);
}
```

`while` Loop

```
int count = 0;
while (count < 5) {
  Serial.println(count);
  count++;
  delay(300);
}
```

`switch` Statement

```
int mode = 2;
switch (mode) {
  case 1:
    Serial.println("Mode 1");
    break;
  case 2:
    Serial.println("Mode 2");
    break;
  default:
    Serial.println("Unknown mode");
}
```

These basic building blocks—strings, functions, and control structures—form the backbone of Arduino sketches.

Figure 1: Logo of Tribhuvan University.