Research Work 5

1. **Setup**

🡪The setup() function is a mandatory function in the Arduino programming language. It is called once when the Arduino board is powered up or reset, and it is typically used to initialize the various settings and parameters needed by the program.

Here's an example of how you might use the setup() function in an Arduino program:

void setup() {

pinMode(13, OUTPUT); // Configure pin 13 as an output

Serial.begin(9600); // Initialize serial communication at 9600 bps

}

In this example, the setup() function is used to configure pin 13 as an output using pinMode(), and to initialize serial communication at a baud rate of 9600 using the Serial.begin() function.

The setup() function is called only once when the Arduino board is powered up or reset, and it is typically used to set up any hardware, initialize variables, or perform any other tasks that need to be done before the main program loop starts running.

1. Loop

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* The loop() function is then used to perform the main tasks of the program. This might include reading input from sensors or other devices, performing calculations, controlling outputs, or communicating with other devices.
* The loop() function is called repeatedly, allowing the program to run continuously. Each time the function is called, the code inside it is executed once, and then the function returns to the beginning to wait for the next call.

Functin:

void loop()

{

// Code to perform main program tasks

}

1. **pinMode**

* pinMode is a function in the Arduino programming language used to configure a digital input or output pin on an Arduino board. It is used to set the mode of a pin as either an input or an output pin.
* The function pinMode()
* Syntax = pinMode(pin, mode)
* Parameters
* pin: the Arduino pin number to set the mode of.  
  mode: INPUT, OUTPUT,

**Example Code**

The code makes the digital pin 13 OUTPUT and Toggles it HIGH and LOW

void setup() {

pinMode(13, OUTPUT); // sets the digital pin 13 as output

}

void loop() {

digitalWrite(13, HIGH); // sets the digital pin 13 on

delay(1000); // waits for a second

digitalWrite(13, LOW); // sets the digital pin 13 off

delay(1000); // waits for a second

}

1. digitalRead

* digitalRead is a function in the Arduino programming language that is used to read the state of a digital input pin on the Arduino board. It is used to read the state of a switch, button, or other digital sensor or device connected to the board.

Its syntax is given below

* Syntax = digitalRead(pin);
* Parameters = pin: the Arduino pin number you want to read
* Returns = HIGH or LOW

**Example Code**

Sets pin 13 to the same value as pin 7, declared as an input.

int ledPin = 13; // LED connected to digital pin 13

int inPin = 7; // pushbutton connected to digital pin 7

int val = 0; // variable to store the read value

void setup() {

pinMode(ledPin, OUTPUT); // sets the digital pin 13 as output

pinMode(inPin, INPUT); // sets the digital pin 7 as input

}

void loop() {

val = digitalRead(inPin); // read the input pin

digitalWrite(ledPin, val); // sets the LED to the button's value

}

1. **Delay**

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Delay means :

Pauses the program for the amount of time (in milliseconds) specified as parameter. (There are 1000 milliseconds in a second.)

* Syntax - delay(ms).

**Example**

int ledPin = 13; // LED connected to digital pin 13

void setup() {

pinMode(ledPin, OUTPUT); // sets the digital pin as output

}

void loop() {

digitalWrite(ledPin, HIGH); // sets the LED on

delay(1000); // waits for a second

digitalWrite(ledPin, LOW); // sets the LED off

delay(1000); // waits for a second

}

1. **DigitalWrite**

* digitalWrite is a function in the Arduino programming language that is used to write a digital signal (either HIGH or LOW or 0x0 and 0x1 to make it on or off ) to a specific pin on the Arduino board. It is used in conjunction with pinMode() to control the state of digital pins on the board.

Example:

void setup() {

pinMode(13, OUTPUT);

}

void loop() {

digitalWrite(13, HIGH); // Set pin 13 to HIGH (ON) state

delay(1000); // Wait for 1 second

digitalWrite(13, LOW); // Set pin 13 to LOW (OFF) state

delay(1000); // Wait for 1 second

}

As we can see in the above program we have used digitalWrite function in which we have declared pin number of Arduino and its state whethere it should be high or low .