Interfacing Photodiode with Arduino

1. Introduction

This project demonstrates how to interface a **photodiode** with an **Arduino** to detect changes in light intensity. The analog readings from the photodiode are displayed through the serial monitor.

2. Key Components

- Arduino Uno board
- Photodiode
- 10kΩ resistor (for pull-down or pull-up if needed)
- Breadboard
- Jumper wires
- USB cable for programming Arduino

3. Working Principle

1. A **photodiode** is a semiconductor device that converts light into an electrical current.
2. When light falls on the photodiode, it generates a small current.
3. The Arduino reads the analog voltage output from the photodiode using its analog input pin (A0).
4. The analog value is then displayed via the **Serial Monitor**.
5. Higher light intensity results in higher analog readings; lower light intensity results in lower readings.

4. Circuit Overview

- Connect the **anode** of the photodiode to the **5V** of Arduino.
- Connect the **cathode** of the photodiode to **analog pin A0** through a **10kΩ resistor** connected to the **ground**.
- This forms a simple **voltage divider** where the Arduino reads the varying voltage across the photodiode depending on the light intensity.

5. Code

```
/*Code written by -
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*/

/*Interfacing Photodiode with Arduino*/



int sensorPin = A0;
int sensorValue = 0;



void setup()
{
  Serial.begin(9600);
  pinMode(sensorPin, INPUT);
}

void loop()
{
  sensorValue = analogRead(sensorPin);
  Serial.println(sensorValue);
}
```

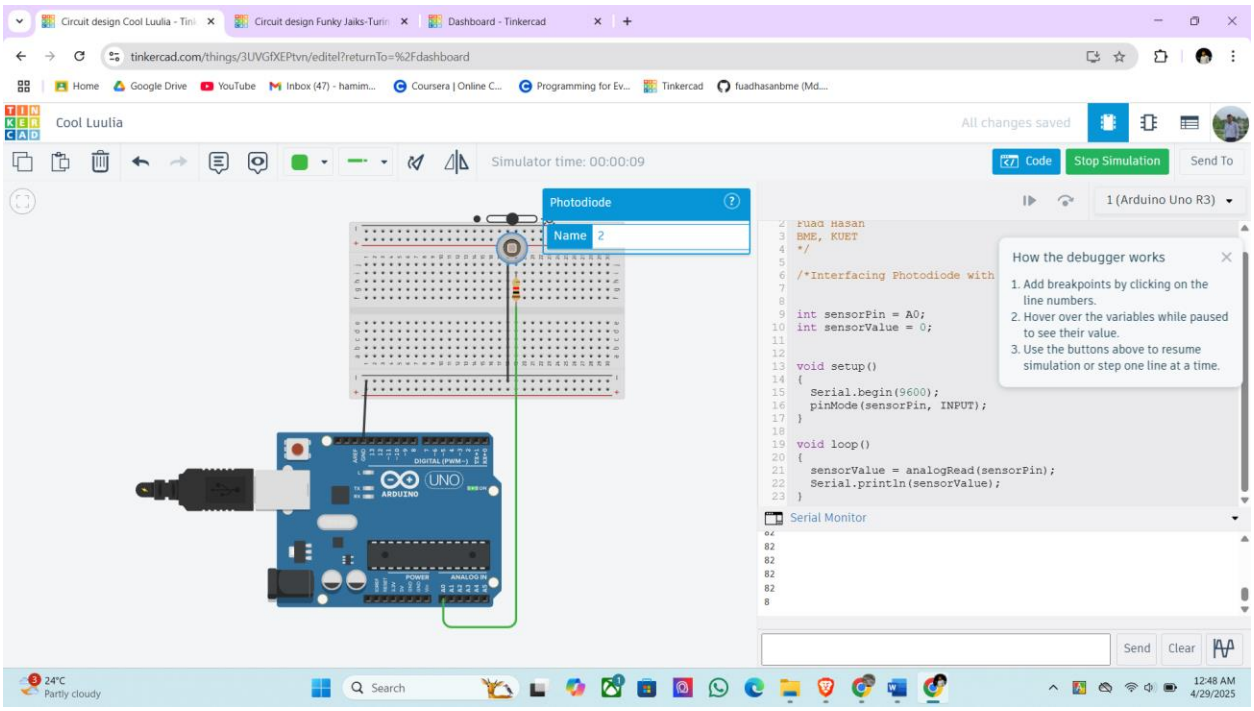
6. Code Explanation

- **Declaration:**
- int sensorPin = A0;

- int sensorValue = 0;
    - sensorPin is set to analog pin A0 where the photodiode output is connected.
    - sensorValue is a variable to store the analog reading.
- **Setup Function:**
- void setup()
- {
- Serial.begin(9600);
- pinMode(sensorPin, INPUT);
- }
    - Serial.begin(9600); starts serial communication at a baud rate of 9600 bps, allowing data to be displayed in the Serial Monitor.
    - pinMode(sensorPin, INPUT); configures the sensorPin (A0) as an input to read analog signals.
- **Loop Function:**
- void loop()
- {
- sensorValue = analogRead(sensorPin);
- Serial.println(sensorValue);
- }
    - analogRead(sensorPin); reads the voltage on A0 and stores it in sensorValue.
    - Serial.println(sensorValue); prints the value to the Serial Monitor, providing real-time light intensity readings.

7. Conclusion

The project successfully interfaces a **photodiode** with an **Arduino**, enabling real-time monitoring of light intensity. It serves as a basic foundation for building more complex light-sensing or automation systems like automatic lights, alarm triggers, or optical communication.


Cool Luulia
All changes saved
Simulator time: 00:00:09
Code
Stop Simulation
Send To
Photodiode
Name 2
1 (Arduino Uno R3)
How the debugger works
1. Add breakpoints by clicking on the line numbers.
2. Hover over the variables while paused to see their value.
3. Use the buttons above to resume simulation or step one line at a time.
Serial Monitor
Send
Clear
24°C
Partly cloudy
Search
12:48 AM
4/29/2025