**Project Title:** Shortest Path Detecting Bot.

**Team Members** (BE CMP 4th SEM)

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**Summarized Project Idea:**

The project involves creating a Shortest Path Detecting Bot using Arduino. Our goal is to develop a robotic system capable of identifying and navigating the shortest route through a designated area or maze. To accomplish this, we will utilize algorithms like Dijkstra's that we learned in 3rd Sem (DSA) or A\* to guide the robot.

The bot will utilize sensors and navigation components to map the area and calculate the most efficient path to a specified destination. By integrating robotics, sensor technology, and programming, our aim is to learn practical skills and knowledge in robotics, problem-solving, and algorithm development.

The application for this technology span across various scenarios such as warehouse navigation, the design of robotic vacuum cleaners like Roomba, and potentially serving as assistive devices for people with mobility challenges (Handicapped people).

**Materials Required For This Project With Their Approx. Cost Estimation:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.N** | **Name of Materials** | **Price per pc (in Rs.)** | **Required Quantity** | **Total Price (in Rs.)** |
| 1. | Arduino Mega | 2000 | 1 | **2000** |
| 2. | Motor Driver L298 | 350 | 1 | **350** |
| 3. | US Sensor | 180 | 1 | **180** |
| 4. | IR Sensor | 95 | 4 | **380** |
| 5. | Jumper Wire | 5 | 100 | **500** |
| 6. | LDR | 15 | 5 | **75** |
| 7. | 4 Wheel Set | 1300 | 1 | **1300** |
| 8. | BreadBoard | 160 | 1 | **160** |
| 9. | Rechargeable Battery | 780 | 4 | **3120** |
| 10. | Battery Charger | 780 | 1 | **780** |
| 11. | Servo Motor | 230 | 3 | **690** |
| 12. | Resistor |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| **Total** |  |  |  | **9,535(Approx.10,000)** |

**So, Final Expected Budget from College Department=Rs 10,000**

**Our Future implementations plan of a shortest path detecting robot:**

Future implementations of a shortest path detecting robot could involve advancements in various areas:

* **AI and Machine Learning**
* **Sensor Technology**
* **Real-Time Data Integration**
* **Optimized Algorithms**
* **Autonomous Navigation**
* **Energy Efficiency**
* **User Interface and Integration**

Creating a system that detects the most cost-effective route in varying traffic conditions involves integrating real-time traffic data, cost considerations (like fuel or tolls), and efficient routing algorithms. This system could collect live traffic information, analyze it to predict traffic conditions, factor in costs associated with different routes, and use algorithms like Dijkstra's or A\* to determine the most economical path. It could be beneficial for optimizing delivery routes, commuting, or logistics planning, helping users save time and resources by selecting the most cost-efficient way to reach their destination in light or heavy traffic scenarios.