**PBL Project Synopsis**

1. **Group No:5**
2. **Title of the project:**

**ACCURATE CLOCK USING ARDUINO**

1. **Proposed work with Methodology :**

**3.1.To identify the project hardware and software requirements.**

**3.2.Develop the code for:**

**3.2.1.Date handling using Julian Date and conversion functions.**

**3.2.2.User input handling (if buttons are used).**

**3.2.3.Speed adjustment based on the calculated inaccuracy.**

**3.2.4.Upload the code to the Arduino.**

**3.2.5.Connect the LCD display and buttons (if used) to the Arduino.**

**3.3.Test the clock functionality:**

**3.3.1.Observe displayed time.**

**3.3.2.Set the initial time manually if buttons are implemented.**

**3.3.3.Monitor the clock over time to understand its accuracy.**

1. **Software & Hardware Specification :**

**Hardware Components for Accurate Arduino Clock:**

**1. Arduino Nano R3:**

**Microcontroller board (the "brain" of your clock)**

**Runs the code you write to control all the components**

**Provides power and communication for the other components**

**2. Tactile Switch, Top Actuated:**

**A push button you press with your finger**

**Can be used to adjust settings on the clock (optional)**

**3. Alphanumeric LCD, 16 x 2:**

**Liquid Crystal Display with 16 columns and 2 rows**

**Shows the time and potentially other information (date, etc.)**

**4. Trimmer Potentiometer, 10k ohm:**

**Adjustable resistor with a knob**

**May be used to calibrate the LCD contrast or adjust brightness (optional)**

**5. Jumper Wires:**

**Flexible wires with pre-crimped connectors**

**Used to connect the Arduino board to the other components for data and power**

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## Software:

**1. Arduino IDE:**

**Integrated Development Environment (IDE)**

**Provides a platform to write, compile, and upload code to your Arduino board**

**Includes tools for debugging and managing your code projects**

**How They Work Together:**

**The Arduino IDE code controls everything. It tells the Arduino board what to do with the readings from the switch (if used) and how to display the time on the LCD.**

**The Arduino board sends power and signals to the LCD to control its pixels and show the time digits.**

**The trimmer potentiometer (if used) allows for fine-tuning the LCD contrast to improve readability.**

**Jumper wires physically connect all the components, allowing them to communicate and exchange data.**

1. **Hardware Tentative Costing:**

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| **Component Name** | **Estimated Average Price (INR)** |
| **Arduino Nano R3** | **₹500** |
| **Tactile Switch, Top Actuated** | **₹120** |
| **Alphanumeric LCD, 16 x 2** | **₹300** |
| **Trimmer Potentiometer, 10k** | **₹80** |
| **Jumper Wires** | **₹500** |
| **Total** | **₹1500** |

1. **Project Group Information:**

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| --- | --- | --- | --- | --- | --- |
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| **Date: 02/04/2024 Dr. ATUL NEWASE**  **Project Guide Name** |
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