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Automatic System Allocation Model (ASAM)

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Abstract: *Automatic System Allocation Model (ASAM) is proposed to allocate the system in the computer lab. The method reads the student's ID barcode to allocate the system and displays the system number to be processed further in the computer lab. Our model aims to maximize system efficacy, reduce energy consumption, and improve convenience for users. It reduces power control and time management.*

Keywords: *Arduino Uno, System Automation, Micro controller, Hardware integration, Software development, System allocation, Bar Codes.*

1. INTRODUCTION:

Every day, all the companies and educational institutions are used computer labs for the students. In the computer lab, occupy the system and the students are switch on the system machine manually. Our proposed model is used to overcome from these process turn-on and turn-off processes are automated. This project seamlessly combines the flexibility of the Arduino UNO microcontroller with barcode scanning technology.

ASAM goal is to automate and simplify CPU power control, providing a rapid and simple replacement for traditional methods. This research offers a feasible route towards improved user convenience and energy efficiency in computer settings through its examination of the system architecture, implementation subtleties, and potential applications.

The remaining sections are organized as follows: Section2emphasis the literature review: The methodology of the proposed model is given in section 3: In section 4, circuit diagram of the proposed model is exposed: The necessary libraries for the proposed model is given in section 5.

2. LITERATURE REVIEW:

Automatic Barcode scanner with billing system using Arduino was implanted by Damodaran et al [1]. In this method, the information is scanned through barcode and the products are splitted based on the products. The performance of the method provides execution time.Rajkiranet.al [2] proposed Student database management and enquires system using barcode scanner. In this method, the student's attendance plays a very vital role in order justify their overall academic performance. The systems enroll the attendance mastering module and it provides better performance.

3. METHODOLOGY:

ASAM describes a system that scans the student's barcode information and compares with the existing value to allocate and switch on the CPU (Control Processing Unit). The LCD (Liquid Crystal display) displays the user name and the allocated system's number to find the system quickly. In this model some major components are used, they are; Arduino UNO, Relay, USB Host, Barcode scanner and LCD Display. The barcode scanner which connected to the Arduino uno microcontroller via the USB host, that captures the barcode data's and transfer to MC [Microcontroller] through the RX and TX.

Then the Microcontroller process the data with existing data successfully. And the MC triggers the relay by assigned digital pins, the display communicates via the SCC & SDA pins. The basic information of barcodes, names and system number are allocated to the module. While scanning the barcode all the information are matched with the existing data.

ESSENTIALTOOLS:

The proposed model requires some basic components, they are

- Arduino Board (UNO)
- USB Barcode Scanner
- I2C LCD Display
- Relays
- USB Host
- Power Supply for Arduino
- Required IDE application

The details description of the components are given in the sub section.

Based on the 8-bit ATmega328P microprocessor, Uno is an open-source; programmable microcontroller board is shown in (Fig.1). It is inexpensive, versatile, and simple to use. To support the ATmega328P microprocessor, additional parts such as a voltage regulator, crystal oscillator, serial communication, are needed.

ESSENTIALTOOLS

Fig.1. Arduino UNO

Fig.2. Sample Barcode

Fig.3. 12C LCD Display

Fig.4. 5V Relay

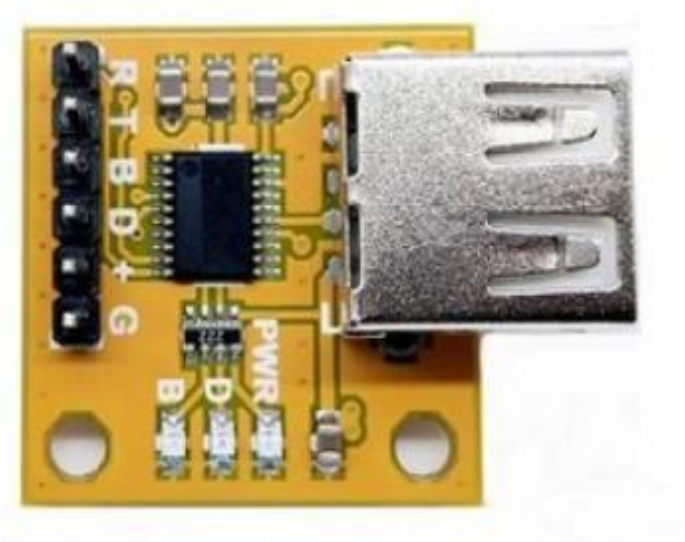

Fig.5. USB Host Shield

4. CIRCUIT DIAGRAM OF THE PROPOSED MODEL

The Fig.6 shows a circuit diagram of the proposed model system. Every equipment is connected with ArduinoUNO by jump wire and bread board. In this system we used some popular and known hardware which is Arduino UNO, LCD Display, USB Host, Relay Module, jump wire are utilized. All the equipment is inter connected with one another is Arduino board.

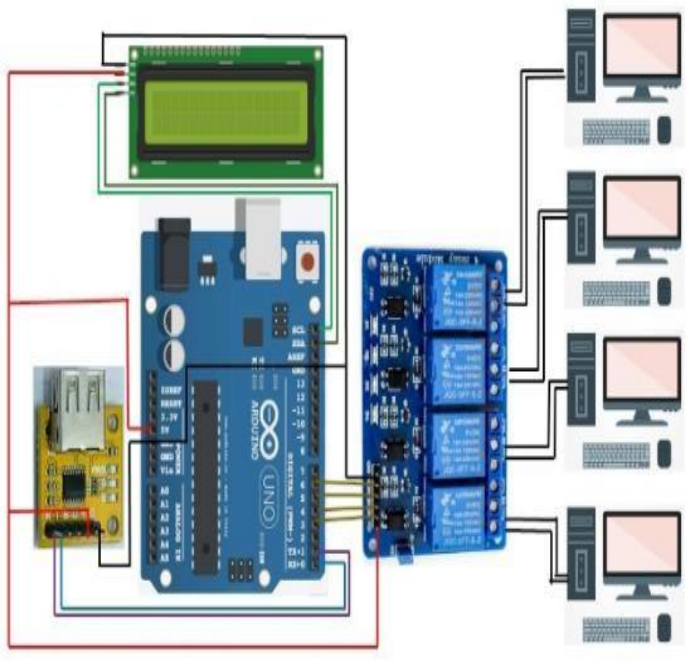

Fig.6. Circuit Diagram

5. BLOCK DIAGRAM AND FLOW CHART:

The working principle of the proposed model is shown in Fig.7. and Fig.8.

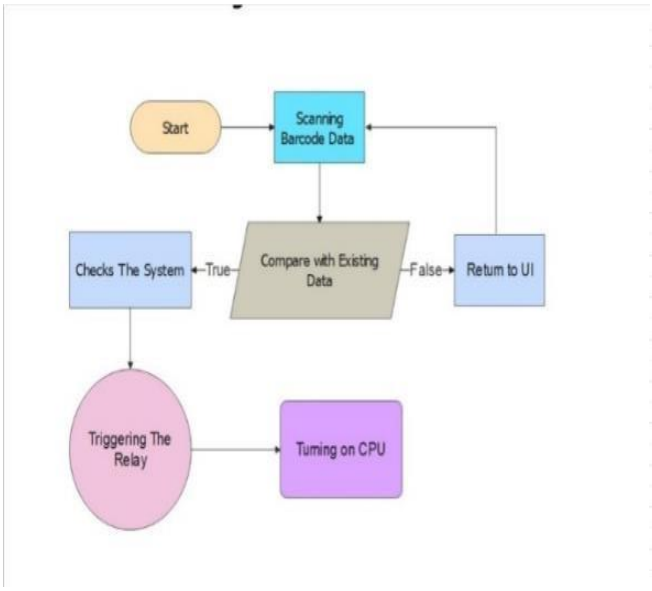

Fig.7. Block Diagram

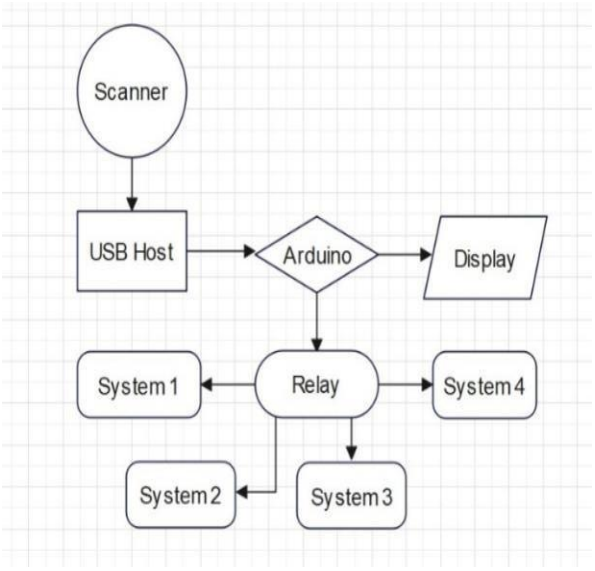

Fig.8. Flow Chart

6. LIST OF LIBRARIES:

The various necessary libraries required for the model is given hereunder,

- Liquid Crystal I2c.h
- String.h
- Wire.h

6.1 Liquid Crystal Display I2c (LCD):

An LCD module with an I2C communication interface integrated into it is called a Liquid Crystal I2C module. Usually, this module consists of a small circuit with an LCD display connection and an I2C adaptor (usually based on the PCF8574 IC).

6.2 String.h:

The C Standard Library contains a header file called String.h that contains functions for working with C-style strings, which are character arrays that end in a null character ('\0'). In order to work with strings in the C programming language, these functions are necessary.

6.3 Wire.h:

All Arduino boards come with the ability to interface with I2C devices, which you can do with this library. The most used protocol, I2C, is used to read and deliver data to and from external I2C

components.

7. RESULT AND DISCUSSION:

The final outcome of this paper leads to the development of automatic system allocation model. The performance of the proposed model provides better result with high accuracy. This model utilizes less power consumption and reduce the environment pollution. Through this project, an automated system has been created so that we can easily control CPU Power like as ON and OFF. One of the objectives of this project is to obtain a CPU control and low-cost project. Inside view is shown in Fig.9,10,11. This provides all connections and components. The power is supplied to Arduino board, the on and off are displayed (5v) on the LCD display. To scan the id card barcode it will allocate the system and automatically on and off.

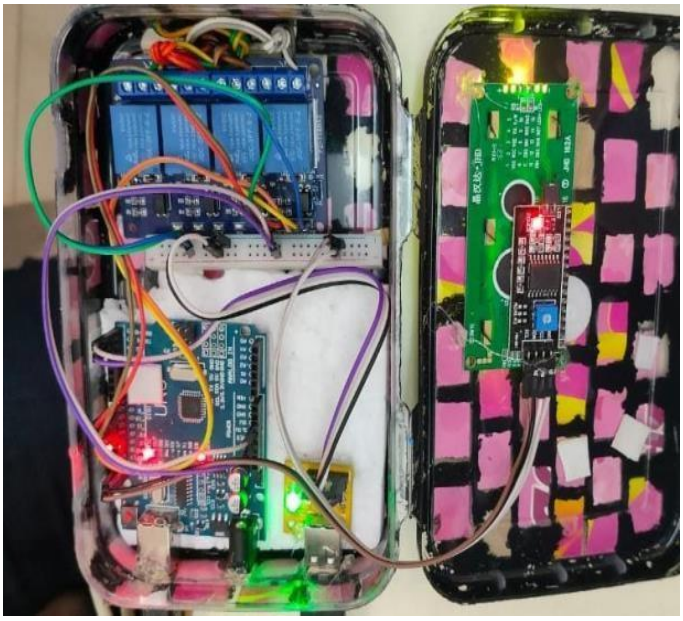

Fig.9. inside View of Proposed Model

Fig.10. Testing

Fig.11. System Off

8. CONCLUSION:

The utilization of Arduino technology to combine automation and system allocation is a noteworthy development across multiple domains. The implementation of Arduino-based systems provides a flexible and economical approach to resource management and task automation for a variety of applications. Since, Arduino is open-source, developers can work together to create innovative and specialized solutions that meet particular needs. The adaptability of Arduino platforms to a wide range of industries, including home automation, industrial processes, agriculture, and healthcare, is made possible by their versatility, which allows for seamless integration with sensors, actuators, and other peripherals.

Organizations can increase output, decrease lab or costs, and maximize resource use by implementing automation based on Arduino. The performance of the model provides high accuracy.

9. REFERENCES:

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