COMPONENTS LIST

Smart Time Table Bell

1. **Microcontroller**: The microcontroller is the proccessor of the system, like the CPU of a computer. For this project we intend to use the Atmel's megaAVR microcontroller Atmega328P. The high performance Microchip 8-bit AVR is based on RISC architecture with 32KB ISP Flash memory, 1 KB EEPROM, 2 KB SRAM, 23 general purpose I/O lines, serial programmable USART, SPI serial port, 10-bit Analog to Digital Converter and many other functions. The microcontroller operates in between 1.8-5.5 volts. The Arduino is a development board for the Atmega328P microcomntroller.
2. **16x4 LCD Display:** A 16x4 LCD display is a type of liquid crystal display (LCD) that has the ability to display 16 characters per line and 4 lines of text. It is a commonly used display module in electronic projects and devices.The LCD display consists of two main components: the display panel and the controller. The display panel is made up of a grid of pixels that are controlled by the controller. The controller is responsible for interpreting and processing data that is sent to the display from an external device, such as a microcontroller or a computer.In a 16x4 LCD display, the display panel is divided into 16 columns and 4 rows. Each column can display a single character or symbol, and each row can display up to 16 characters. The display can be used to show various types of information, such as numerical values, letters, and symbols.
3. **RTC Module:** A Real Time Clock(RTC) module is an electronic component that keeps track of time and date, even when the Arduino board is turned off or reset. It typically contains a crystal oscillator, a battery backup, and a clock chip that keeps accurate time. The RTC module communicates with the microcontroller through a serial interface such as I2C or SPI, and can be easily integrated into projects where accurate timekeeping is essential.The crystal oscillator in the module generates a precise frequency that is used by the clock chip to keep track of time. The clock chip is typically programmed with the current date and time, and is capable of calculating the time and date based on this starting point. In addition, the battery backup ensures that the RTC module continues to keep accurate time even when power to the microcontroller board is interrupted.
4. **Relay:** A relay is an electrically operated switch that is used to control the flow of electricity in a circuit. It consists of a coil, an armature, and one or more sets of contacts.Relays are commonly used in applications where a low-power signal is used to control a high-power circuit. For example, a low-power signal from a microcontroller or a switch can be used to energize the coil of a relay, which in turn controls a high-power circuit such as a motor or a heating

element. In this way, the relay acts as an intermediary between the low-power control circuit and the high-power load.

5. **Buzzer:** A buzzer is a simple electronic device that is used to generate an audible sound or tone. It is typically composed of a piezoelectric element, a resonant cavity, and an oscillator circuit. It is used to replace the mechanical bell in the project prototype.