**LIBRARY MANAGEMENT SYSTEM**

The aim of this project is to design a Library Management System using Arduino UNO. To build the project, our required components are,

* Arduino UNO
* RFID module
* Bluetooth module
* Buzzer
* Smart phone
* Common Cathode LED
* Resistors

**Introduction:**

Radio Frequency IDentification (RFID) is a rapidly emerging technology which allows productivity and convenience. It is a new generation of auto identification and data collection technology which helps to automate business processes and allows identification of large number of tagged objects like books, using radio waves. This project proposes RFID Based Library Management System on Arduino UNO, that would allow fast transaction flow and will make it easy to handle the issue and return of books from the library without much intervention of manual book keeping which benefits by adding properties of traceability and security. Tags or transponders, the vital components of RFID, are the electronic chips consisting of an integrated circuit and antenna coil that communicate with a reader by means of a radio frequency signal. Since RFID does not require ‘line-of-sight’ between the transponder and the reader, it surmounts the limitations of other automatic identification devices, such as bar coding. Smart labels/tags are designed for lasting to lifetime of the item they identify and also perform the EAS (Electronic Article Surveillance) function to detect the thefts. With the help of Radio Frequency Identification, we intend to make library management such as, member identification, book check-out and book return. It is much more self-serviced and easy and reliable.

RFID is an innovative automated system for automatic identification, sorting, arranging and tracking of different materials. Currently RFID applications range from book tracking and stock management, to theft detection and automatic book sorting in libraries. Radiofrequency identification (RFID) technology is a dynamic link between people, objects and processes and in the near future it plays a prime role in data collection, identification as well as analysis necessary for specific library operations. An automated library with the support of RFID technology would be a “self service station” that demands least intervention by the library personnel. Efforts are being made to introduce self-service “check-in” and “checkout“ that avoid long delay in the delivery of library material and also for achieving better efficiency in operations. It is used in libraries primarily to automate the book handling process including checkout, inventory control, check-in and anti-theft.

**Working:**

To make the system secure, the system will be initially turned off and it only be turned on once a person approaches the RFID reader with a genuine RFID tag. If the card is fake, a red led indication along with buzzer alarm will be happened and if the card is genuine, a green led indication along with a short buzzer beep will be happen. This makes the system on. Once the system turned on, the blue LED indication will be there and the person has two options available to choose. One is to rent book from the library and the other one is to check the renting history. To rent a book, the person has to provide his name and mobile number. After entering these data, the person can leave the library with the book after scanning the tag of the book to the RFIF reader. All the information entered by the person along with the name of the book and the renting time will be saved in Arduino’s flash memory and is accessible anytime wanted. To access the saved data from the memory, all you have to do is to check the renting history. After every successful complete interaction, the system will automatically shut down to make it even secure.