**FRONT GATE AUTOMATION**

The aim of this project is to design an automation system for front gates, using Arduino. To build the system, our required components are,

* Arduino UNO
* Servo motor
* RFID module
* IR sensor
* Buzzer
* LED

**Introduction:**

Whatever the system is, the security is a major concern. How much security can a front gate offer? Here in this project, we are developing a front gate automation system with extreme level security! It can be hired by individuals, firms, trusts, companies etc. The priority of the front gate differs on the basis of its security. This is a half mechanical and half electronical system, based on Radio Frequency Identification (RFID). This project can be organized in offices (treasury), schools and homes. In this present age, safety has become an essential issue for most of the people especially in the rural and urban areas. Some people will try to cheat or steal the property which may endanger the safety of money in the house and office. To overcome the security threat, a most of people will install highly secure gate mechanisms or alarm system. There are many types of gate mechanisms available in the market which utilizes different types of sensor. The sensor can detect different types of changes occur in the surrounding and the changes will be processed to be given out an alert according to the pre-set value. By the same time this system may not be good for all the time. In this project, we have implemented safety of the properties like house and office (treasury) by using RFID which will be more secure than other systems.

Radio-frequency identification (RFID) based access-control system allows only authorized persons to open the front gate. Basically, an RFID system consists of an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. There are many different types of RFID systems in the market. These are categorized on the basis of their frequency ranges. Some of the most commonly used RFID kits are low-frequency (30-500 kHz), mid-frequency (900 kHz-1500MHz) and high frequency (2.4-2.5GHz). The passive tags are lighter and less expensive than the active tags.

**Working:**

The working of this gate mechanism is quite simple. The authentic person will be provided with a keychain which holds a UID. There will be an RFID reader module, that is mounted on the gate pillar for reading the keychain. The person can approximate the reader with his keychain for opening the gate and if the keychain is of the correct UID, the gate will start opening. Else, the gate will stay closed. If the card is not genuine, an alarm will ring right away. After approximating the card with the genuine tag, the gate will only be open if the IR sensor detects the vehicle. Otherwise, the gate will stay closed.