

| SECTION 1 | SYSTEM DESCRIPTION |
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| <p>ABSTRACT</p> | <p>In the current scenario, vehicular traffic is increasing all over the world, especially in large urban areas. With the ever-increasing number of road users and the limited resources provided by the existing infrastructures, intelligent traffic control will become a very important issue in the future. These needs led to an increased demand for the traffic control system. Therefore, there is a need to improve traffic control to better accommodate this increasing demand and to preserve pedestrians from accidents and to implement the movement of pedestrians first and then cars to preserve the lives of pedestrians. In this project, we will show the improvement of traffic light control on the road.</p> |
| <p>Overview</p> | <p>The main objective of this project is to control traffic lights based on pedestrians pressing the control button, and in this system some components installed at a fixed distance are used. All sensors are connected to the microcontroller, which in turn controls the traffic light system according to the pedestrian's pressure on the button, this aspect is given more priority.</p> |
| <p>Embedded Systems</p> | <p>An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use.</p> <p>Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale.</p> <p>Physically, embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure.</p> <p>In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems such as the operating systems and microprocessors which power them</p> |

but are not truly embedded systems, because they allow different applications to be loaded and peripherals to be connected.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device. Industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system. Embedded systems that are programmable are provided with a programming interface, and embedded systems programming is a specialized occupation. Certain operating systems or language platforms are tailored for the embedded market, such as Embedded Java and Windows XP Embedded. However, some low-end consumer products use very inexpensive microprocessors and limited storage, with the application and operating system both part of a single program. The program is written permanently into the system's memory in this case, rather than being loaded into RAM (Random Access Memory), as programs on a personal computer.

In recent days, you are showered with variety of information about these embedded controllers in many places. All kinds of magazines and journals regularly dish out details about latest technologies, new devices; fast applications which make you believe that your basic survival is controlled by these embedded products. Now you can agree to the fact that these embedded products have successfully invaded into our world. You must be wondering about these embedded controllers or systems. The computer you use to compose your mails, or create a document or analyze the database is known as the standard desktop computer. These desktop computers are manufactured to serve many purposes and applications.

You need to install the relevant software to get the required processing facility. So, these desktop computers can do many things. In contrast, embedded controllers carry out a specific work for which they are designed. Most of the time, engineers design these embedded controllers with a specific goal in mind. So these controllers cannot be used in any other place.

Theoretically, an embedded controller is a combination of a piece of microprocessor based hardware and the suitable software to undertake a specific task. These days designers have many choices in microprocessors/microcontrollers. Especially, in 8 bit and 32 bit, the available variety really may overwhelm even an experienced designer.

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| | <p>Selecting a right microprocessor may turn out as a most difficult first step and it is getting complicated as new devices continue to pop-up very often.</p> |
| BLOCKS Of Embedded System | |
| SECTION 2 | SYSTEM DESIGN |
| CPU | <p>AVR – Atmega 32 (8-bit microcontroller)</p> <pre> graph LR ID[Input Device] --> MCU subgraph MCU [AVR – Atmega 32] subgraph CPU [Central Processing Unit] CU[Control Unit] ALU[Arithmetic/Logic Unit] end MU[Memory Unit] CPU <--> MU end MCU --> OD[Output Device] </pre> |
| Memory | <p>Registers, RAM, ROM</p> <p>The memory is categorized as Random Access Memory (RAM) and Read Only Memory (ROM). The contents of the RAM will be erased if power is switched off to the chip, whereas ROM retains the contents even if the power is switched off. So, the firmware is stored in the ROM. When power is switched on, the processor reads the ROM; the program is executed.</p> |
| INPUT Devices | <p>IN ECUAL (BUTTON) , IN MCAL (PINS) DRIVERS</p> <p>Unlike the desktops, the input devices to an embedded system have very limited capability. Many embedded systems will have a small Button press one it to give a specific command. A Button may be used to input only the digits. Many embedded systems used in process control do not have any input device for user interaction; they take inputs from sensors or transducers and produce electrical signals that are in turn fed to other systems.</p> |
| OUTPUT Devices | <p>IN ECUAL (LEDs) , IN MCAL (PINS) DRIVERS</p> <p>The output devices of the embedded systems also have very limited capability. Some embedded systems will have a few Light Emitting Diodes (LEDs) to indicate the health status of the system modules. may also be used to display some important parameters.</p> |

Interfaces

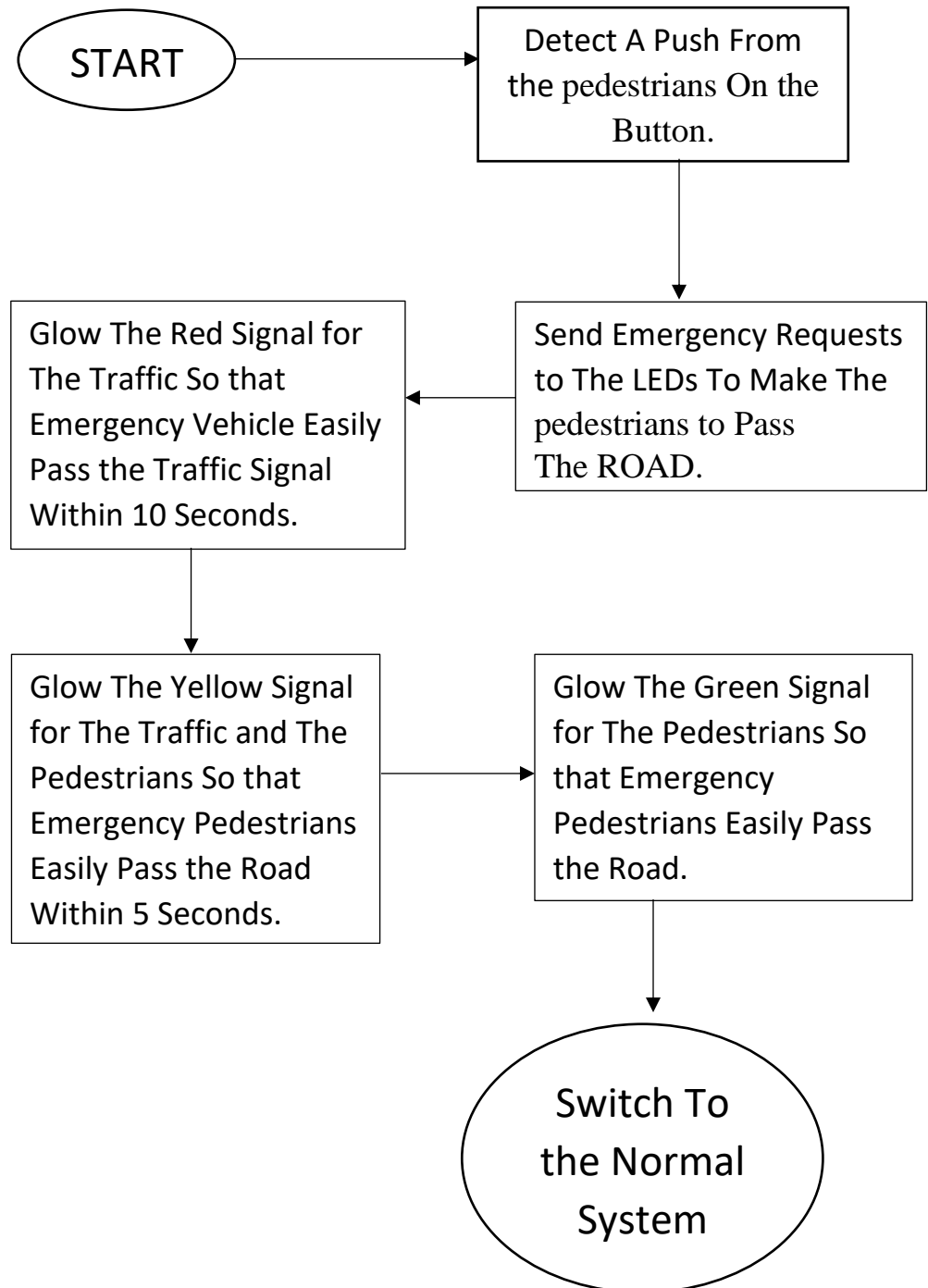
IN MCAL (TIMERS (TIMER0 / TIMER2)) , Interrupts

The embedded systems may need to, interact with other embedded systems at they may have to transmit data to a desktop. To facilitate this, the embedded systems and provided with one or a few interfaces.

SECTION 3

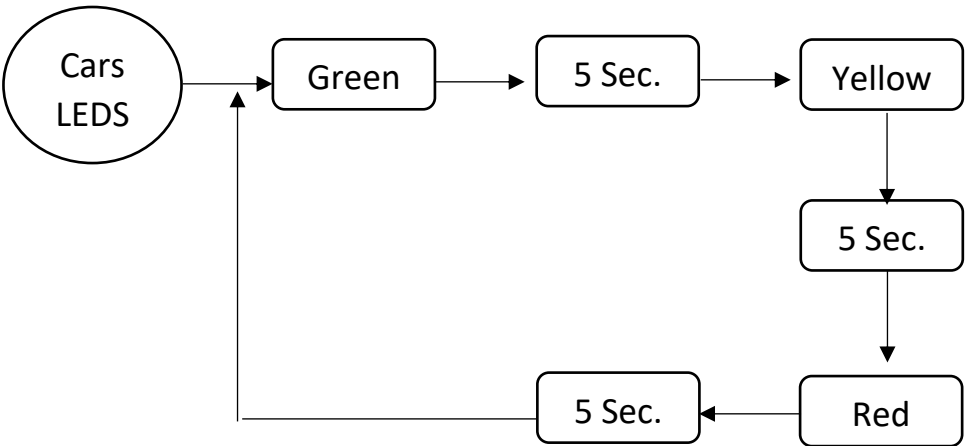
SYSTEM FLOW CHARTS

IDEA

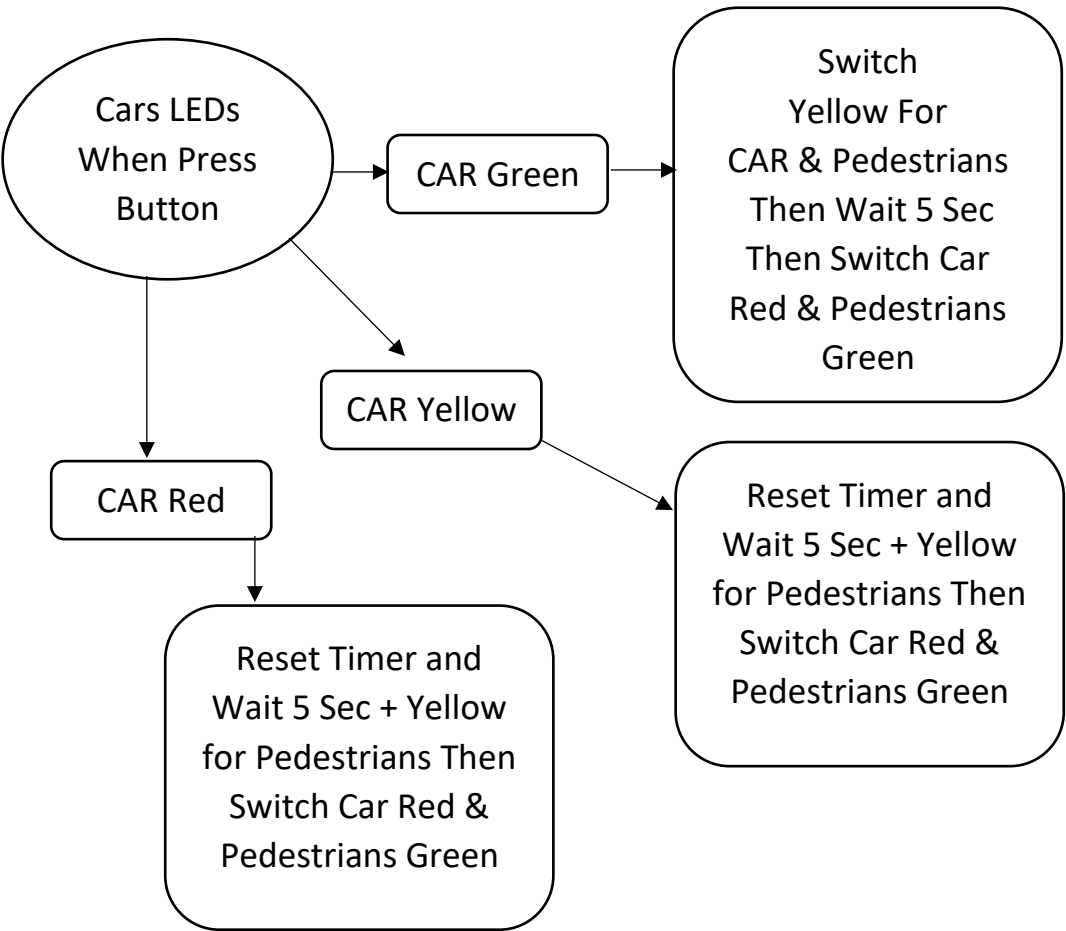


MODES

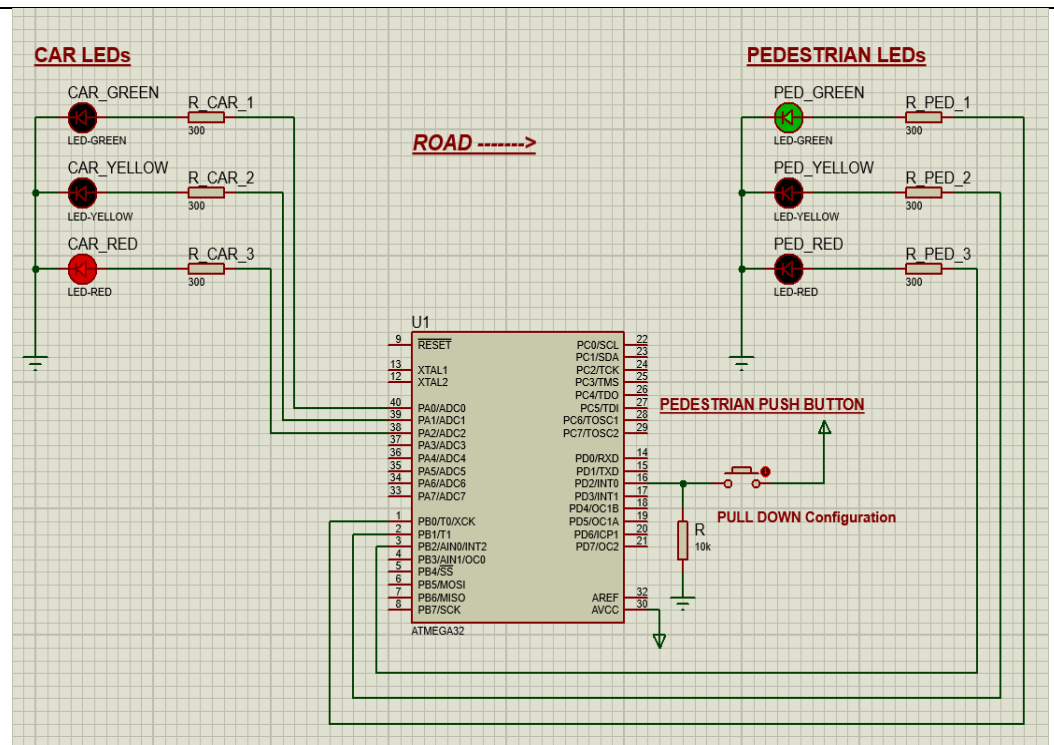
Normal Mode



PedeStrians



System Circuit



SECTION 4

SYSTEM CONSTRAINTS

Constraints

- The Unuse of Stop Sign or Walk Sign For Pedestrains use Only LEDs.
- The Unuse of Stop Sign or Walk Sign For CARS use Only LEDs.
- The Unuse of Communications Protocols In Embedded Systems.

Future Work

Instead of Return Void for All Function Will Set A Value Return For ERROR Handling In the Future.