

Smart IoT Applications Using Proteus

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Abstract:

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The IoT is enabled by the latest developments in smart sensors and communication technologies. The basic premise is to have smart sensors collaborate directly without human involvement to deliver a new class of applications. Internet of Things is playing a major role in automatic control of many applications remotely. In this paper a wide variety of IoT applications such as smart car parking system, voltage, temperature and frequency measurement, quiz game and electronic calculator are simulated using proteus software.

Keywords —Proteus, Internet of Things, smart car parking system, voltage, temperature and frequency, quiz game, electronic calculator.

1. Introduction

Now a days in numerous open places, for example, shopping centers, multiplex frameworks, healing facilities, workplaces, showcase regions there is a vital issue of auto stopping. The car-parking area has many lanes/slots for car parking. Therefore for parking a car one has to look for all the lanes. Moreover this involves a lot of manual labour and investment. So there is a need to build up a computerized stopping framework that shows specifically the accessibility of empty stopping spaces in any path comfortable passage. The task includes a framework including infrared transmitter-beneficiary match in every path and a LED/LCD show outside the auto stopping entryway. So the individual envious to stop his vehicle is very much

educated about the status of accessibility of stopping opening. Ordinary stopping frameworks don't have any keen observing framework and the parking areas are checked by security monitors. A great deal of time is squandered in looking empty space for stopping and numerous a times it makes jams. Conditions turn out to be more regrettable when there are different stopping paths and every path with numerous stopping spaces. Use of parking management system would reduce the human efforts and time with additional comfort.

The microcontroller based embedded system is being used for developing many industrial control systems due to its accuracy and high speed in computation. So a

microcontroller based shrewd temperature controller has been proposed and created. It can be used for the automation of temperature controlling system like oil refining, paper manufacturing, power plants, garments industry, chemical industry, manufacturing plants, homes, or any kind of industries where they need.

Calculator is a microcontroller comprehensive. Four functions addition, subtraction, multiplication and division (+, -, /, *) can be performed on single and multi digit numbers using this calculator. User Inputs the numbers using 4×4 keypad. Result is displayed on the 16×2 LCD.

The quiz game is designed to increase enable students to write exam based on multiple-choice questions by displaying on LCD screen and also displays each response.

This paper is organized as follows: Section 2 presents literature survey on different applications; Section 3 describes algorithms and flowcharts, Section 4 is focused on experimental results and finally, future work and conclusion of the paper in this Section 5.

2. Literature Survey

Faiz Shaikh et.al., [1] discussed about a smart car parking system. Many researchers have implemented systems which have dynamic arrangement scheme for satisfying the different needs of drivers and service providers, which is based on real-time parking information. New researcher for innovation of new techniques to manage the problem faced by drivers on day to day basis. It is taking a lot of time for drivers to park the vehicle in crowded areas. An innovate system which can automatically

show available free slots in parking area and can be extendable for various other platforms such as railway stations, airports, and mall parking spaces etc. This will make the management of the parking spaces efficiently, by eliminating need of manual labor work. People owning vehicles face parking problems in most metropolitan area, especially during peak hours. The difficulty roots from not knowing where the parking spaces are available at the given time, even if this is known, many vehicles may pursue a small number of parking spaces which in turn leads to serious traffic congestion.

Faheem et.al., [2] discussed the parking problems that arise due to the unavailability of a reliable, efficient and modern Parking system. The use of different modern techniques such as Expert Systems, wireless sensor based, fuzzy based, and Vision based can reduce the parking related issues. Such system can help the economic, social and safety based aspects of the society. It also helps in preserving the environment, fuel and time. Future work should be done for integrating different technologies together in order to achieve a system which is the most efficient, reliable, secure and inexpensive for vehicle parking.

Electronic calculator developed by one of new technology i.e., proteus. Calculator calculates multi digit arithmetic operations. Within less time very accurate values, and easy to calculate system is needed.

Nan Win Aung, Aung Ze Ya [3] proposed an electronic load controller (ELC) has been developed which has increased the simplicity and reliability of modern micro-

hydro sets. The proposed design of a microcontroller based ELC is a feedback voltage based controller by using a load control technique to control and retain the generator terminal voltage and system frequency constant. This technique mostly used in uncontrolled hydro turbine driven generators in a stand-alone power plant. ELC can be fitted at any point in electrical system and high reliability, low maintenance and simple to operate. In many industrial applications automatic voltage, frequency and temperature measuring is to be done.

Technology in the field of education is constantly evolving, growing and this increase will continually offer new and extraordinary advances in the field of education. Traditional E-learning systems developed for laptop and desktops were based on standalone application and web based application architecture. These applications will have some limitations to be used effectively or we cannot use them easily since these applications need a computing device and network connectivity. One of the new technologies is quiz game it tests student knowledge and interprets where the students are lagged.

3. Methodology

In today's world IoT plays a major role in day to day activities therefore in this paper simulation of IoT application such as smart car parking system, voltage, temperature and frequency measurement, quiz game and electronic calculator is done. For this purpose Arduino 1.8.5 and Proteus 8.0 versions are used.

The following applications are developed:

- i. The smart car parking system shows which slot is free for parking.
- ii. The voltage, temperature and frequency meter measures volt meter, temperature and frequency meter readings.
- iii. An automated quiz game shows the knowledge on particular user.
- iv. The electronic calculator calculates arithmetic calculations using proteus simulation.

3.1 Algorithms

Algorithm 1: Car parking system

1. Start
2. Read password
3. Validate password
4. If (password==true)
 Then
 4.1 Enter choice
 1. Park
 2. Leave
 4.1.1 If (Parking slot==free)
 Then
 Select slot number
 If (Select slot==free)
 Then
 Assign slot for parking
 Else
 Display number if slot is free

Algorithm 2: Voltage, temperature and frequency meter

1. Start
2. Declare voltage, temperature and frequency
3. Switch (choice)
 - Case 1: Voltage
 - Display voltage results
 - Case 2: Temperature
 - Display temperature results
 - Case 3: Frequency
 - Display frequency results
4. End

Algorithm 3: Quiz game

1. Start
2. Select mode 0 or 1
 - 2.1 If (mode==0)
 - Then
 - Select one user
 - 2.1.2 If (mode==1)
 - Then
 - Select two users
3. Display question with options
4. If (answer==true)
 - Then

- Add 5 marks
- Else
 - If (answer==false)
 - Then
 - Subtract 2 marks
5. Display total marks
6. Display results
7. End

Algorithm 4: Electronic Calculator

1. Start
2. Enter multi digit numbers, operator;
3. Switch (choice)
 - Case 1: Addition
 - Addition two numbers and display results
 - Case 2: Subtraction
 - Subtraction two numbers and display results
 - Case 3: Multiplication
 - Multiply two numbers and display results
 - Case 4: Division
 - Divide two numbers and display results
4. End

5. Experimental Results

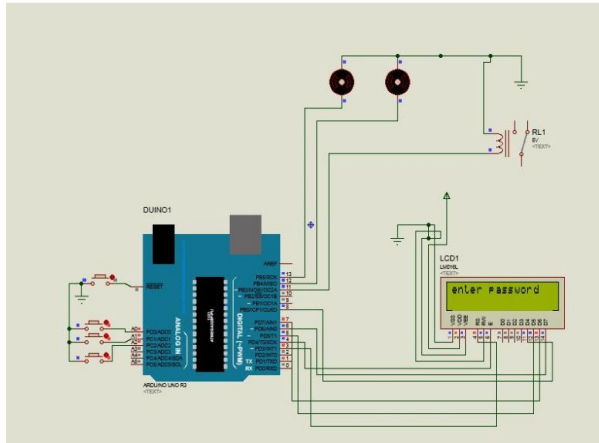


Figure 1: Smart parking system for enter password

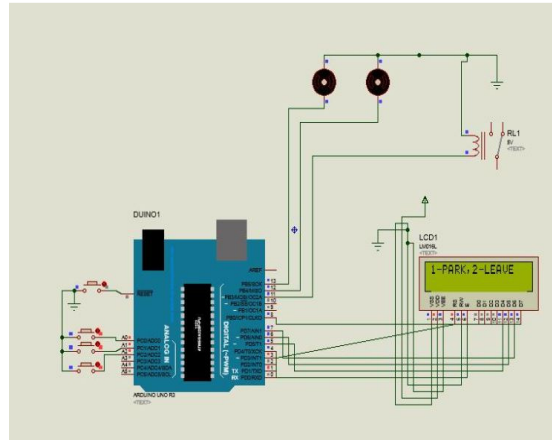


Figure 2: Smart parking system for parking or leaving

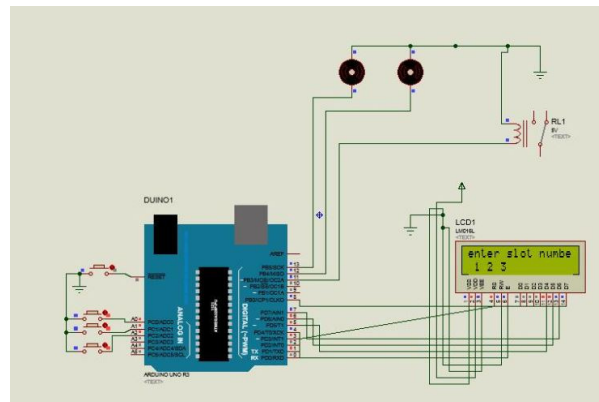


Figure 3: Smart car parking system for slot number

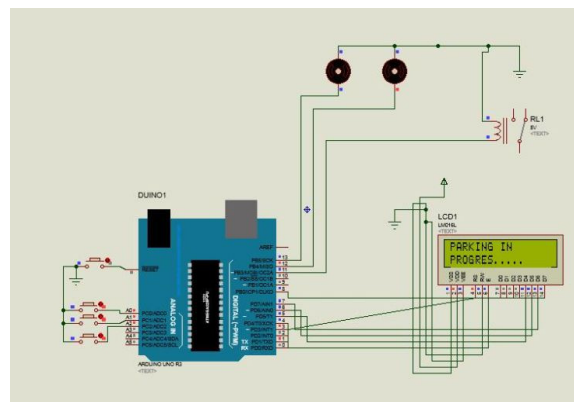


Figure 4: Smart parking system for parking is processing

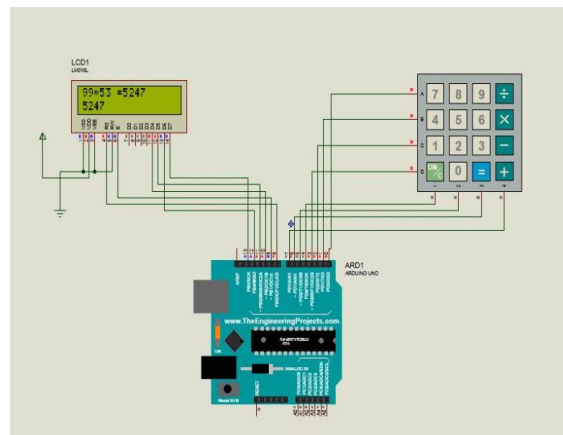


Figure 5: Electronic calculator on multiplication

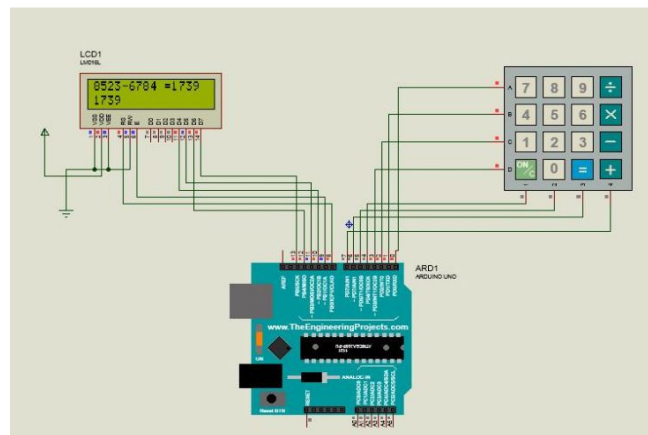


Figure 6: Electronic calculator on subtraction

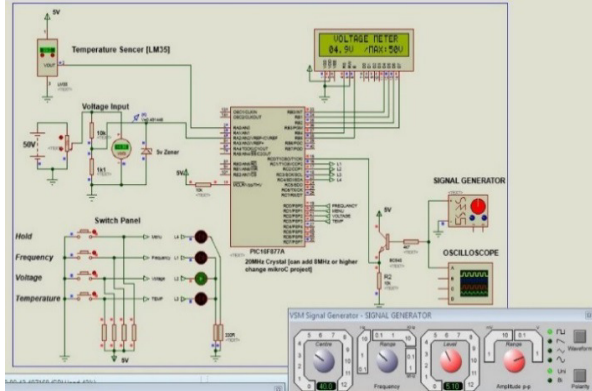


Figure 7: Simulation by volt meter

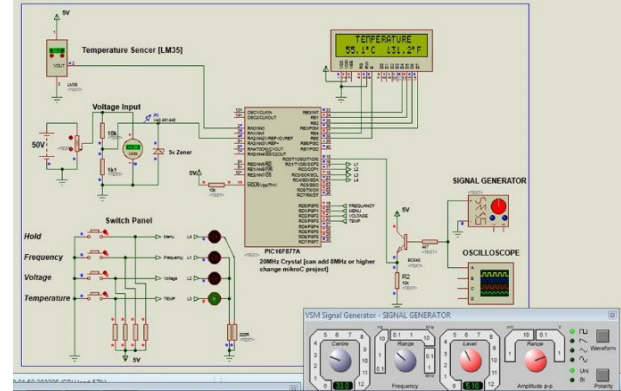


Figure 8: Simulation by temperature meter

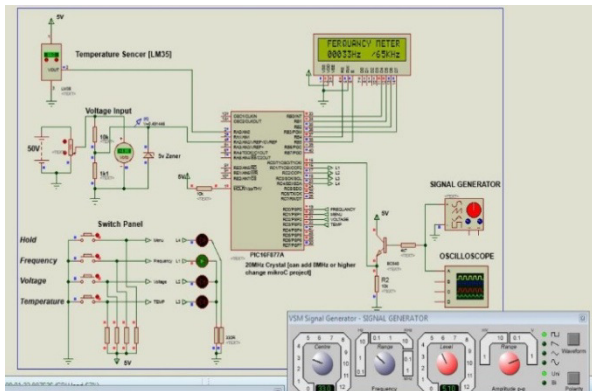


Figure 9: Simulation by frequency meter

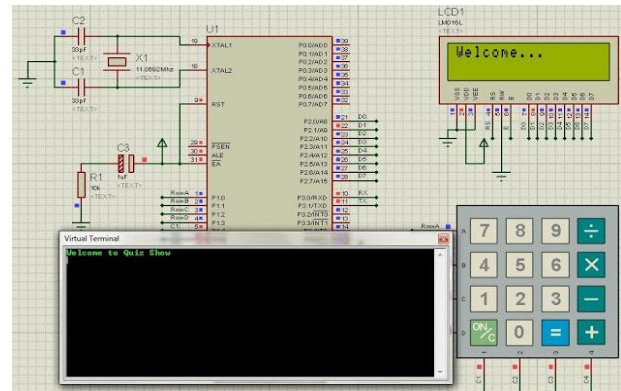


Figure 10: Quiz game starts

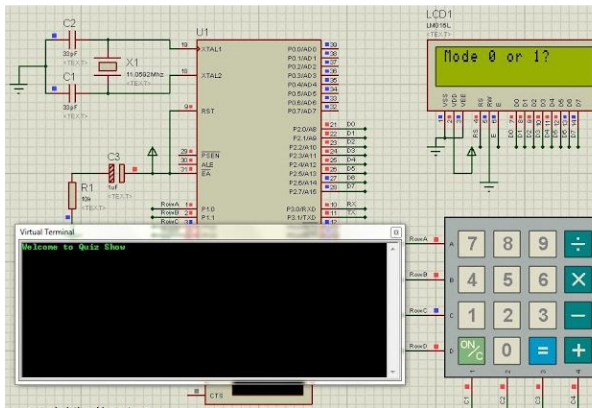


Figure 11: Select modes on quiz game

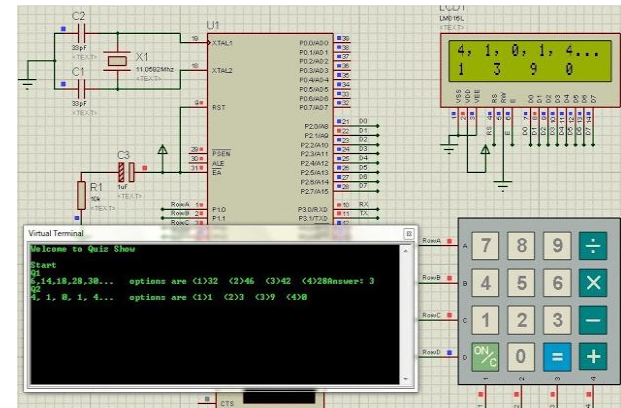


Figure 12: Select question on quiz game

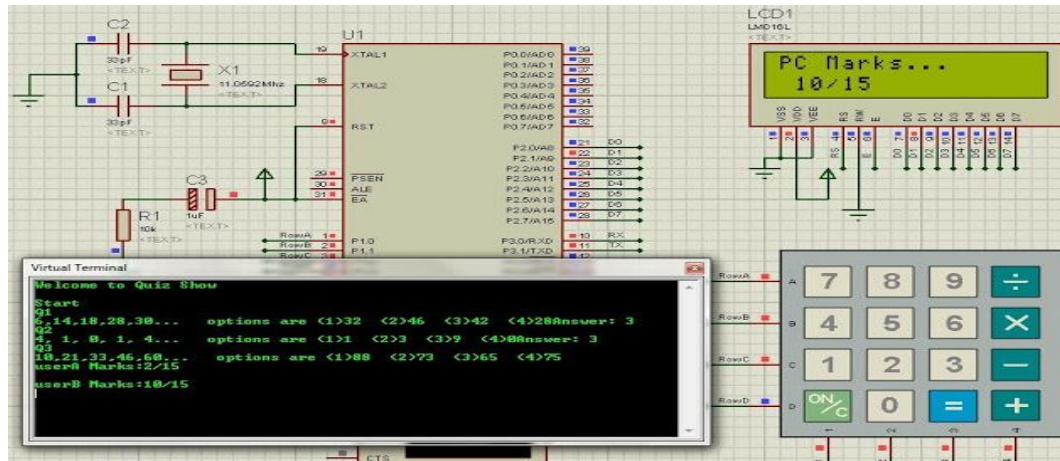


Figure 13: Results display on quiz game

6. Conclusion and Future work

The smart car parking system enables to identify free slots automatically to the vehicle drivers and there by avoids traffic jam at the time of parking. The voltage-temperature- frequency system displays the corresponding readings based on the selection of concerned input. An interactive quiz system which automatically displays questions and evaluates the answers is successfully implemented. A digital smart multi-digit calculator is implemented where one can perform arithmetic operations.

In future a Smart calculator, which calculates trigonometric and scientific calculations, is to be developed. There is a need to develop a multi-player multi agent based quiz master system.

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