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ModelLing Electronic Door Bell with a Counter for Visitors by Proteus Programme

نمذجة جرس باب الكتروني مع عداد للزوار بواسطة برنامج بروتيوس

A thesis submitted in partial for fulfillments of the requirement of the degree of master in physics

Submitted by

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الآية

قال الله تعالي:

﴿وَلَوْلَا أَنْ يَكُونَ النَّاسُ أُمَّةً وَاحِدَةً لَجَعَلْنَا لِمَنْ يَكْفُرُ بِالرَّحْمَنِ لِبُيُوتِهِمْ سُقُفًا مِنْ فَضَّةٍ وَمَعَارِجَ عَلَيْهَا يَظْهَرُونَ (33)وَلِبُيُوتِهِمْ أَبْوَابًا وَسُرُرًا عَلَيْهَا يَتَّكِئُونَ (34) وَزُخْرُفًا وَإِنْ كُلُّ ذَلِكَ لَمَّا مَتَاعُ الْحَيَاةِ الدُّنْيَا وَالْآخِرَةُ عِنْدَ رَبِّكَ لِلْمُتَّقِينَ (35) ﴾

صدق الله العظيم

سورة الزخرف

Dedication

Thanks God Almighty, who illuminated the path for me, opened for me the doors of knowledge and provided me with patience and will.

Then to who consecrated me by education at a young age, and they were the shines light that enlighten my thoughts by advice and guidance in old age. Mom and Dad, May Allah protect them.

To who had made a head start to the furtherance of science and education that have been made and did not wait for a giving hope. Dr. Amel Abdallah Ahmed Elfaki.

To who planted the optimism in my path and gave me aids, facilities, information, and ideas. To the engineer Mohamed Khalid Gasm Elsied. Great thanks from me to him.

To my brothers and sisters and my girlfriend Marwa osman.

And thanks and gratitude to teacher Omer and brother Taha who stood beside me.

My thanks to all who contributed in the output of this research to come into its final version .

Acknowledgement

To the first guided and cresset that illuminates the path for me, to whom he gave me and still gives me Without Borders, to whom I raised my head high with pride ..... Abu Aziz

God perpetuate a wealth me

To whom her heart saw me before her eyes and her womb embraced me before her hands, to my tree that wither not , to shadow that accommodated to him at all a while ..... my beloved mother

may God save her

To the spirit of my grandfather God rest his soul and May He bestow His mercy and His soul rest in peace Who loved science and was in love with our ideal of science

May God have mercy on him

To the candles that illuminate the path for me, my brothers Mohammad, Ghazi and Ashraf who encouraged me and continued without charge

To the bright jewel and protected ivory and the pearl

Dear sister Fatima

To my fellow path and colleagues .....to the engineer Mohammed Khalid and teacher Omar who assistant me through my career and preleased me for practical work

Allah keep them save

All of them dedicate the fruit of my best ...

Researcher

Nisreen Elfadil Ali

Abstract

Electronic bells do not contain electromagnet or metal panels for the issuance of the sound. But using an integrated electronic circuits, and when you press the doorbell button is sent an electronic signal to turn on a musical tone stored in the memory bell.

Electronic door bell is a device that works to calculate the number of visitors, be it by clicking on it. This device is equipped with counter numbers shows through its screen. A program that works with this bell calls (Proteus).

المستخلص

الأجراس الإلكترونية لا تحتوي على مغناطيس كهربي أو ألواح معدنية لإصدار الصوت. إنما تستخدم دوائر الكترونية متكاملة وعند الضغط على زر الجرس يتم إرسال إشارة الكترونية لتشغيل نغمة موسيقية مخزنة في الذاكرة الخاصة بالجرس .

جرس الباب الإلكتروني هو جهاز يعمل علي حساب عدد الزوار ويكون ذلك بالضغط عليه . وهذا الجهاز مزود بعداد يظهر الأعداد من خلال شاشته . والبرنامج الذي يعمل به هذا الجرس يسمي (بروتيوس).

Contents

List of Figures

Chapter One

Introduction

1.1 History of electronics:

Theoretical and experimental studies of electricity during the 18th and 19th centuries led to the development of the first electrical machines and the beginning of the widespread use of electricity. The history of electronics began to evolve separately from that of electricity late in the 19th century with the identification of the electron by the English physicist Sir Joseph John Thomson and the measurement of its electric charge by the American physicist Robert A. Millikan in 1909.

At the time of Thomson's work, the American inventor Thomas A. Edison had observed a bluish glow in some of his early light bulbs under certain conditions and found that a current would flow from one electrode in the lamp to another if the second one (anode) were made positively charged with respect to the first (cathode). Work by Thomson and his students and by the English engineer John Ambrose Fleming revealed that this so-called Edison effect was the result of the emission of electrons from the cathode, the hot filament in the lamp. The motion of the electrons to the anode, a metal plate, constituted an electric current that would not exist if the anode were negatively charged [1].

In 1906 Lee De Forest, an American engineer, developed a type of vacuum tube that was capable of amplifying radio signals. De Forest added a grid of fine wire between the cathode and anode of the two-electrode thermionic valve constructed by Fleming. The new device, which De Forest dubbed the Audion (patented in 1907), was thus a three-electrode vacuum tube. In operation, the anode in such a vacuum tube is given a positive potential (positively biased) with

respect to the cathode, while the grid is negatively biased. A large negative bias on the grid prevents any electrons emitted from the cathode from reaching the anode; however, because the grid is largely open space, a less negative bias permits some electrons to pass through it and reach the anode. Small variations in the grid potential can thus control large amounts of anode current [1] .

1.2 Objective:

1-The main target of thesis project is designing bell door with electronic counter for visitors practically by proteus program.

2-Reduce the cost and ease testing circuits by proteus program .

3-Make use of simSSDulation technology in the development electronic circuits

1.3 Literature layout:

These studies remind :

-Rubaie, a researcher from the University of Basra in 2011 dealing with this researcher bell door with an electronic counter for visitors from 0 to 9 tones of bell using one counter, while addressed in this research the number of rings the bell of x to 99 Rene bell using enumerators**.**

-Julian Ross, J. 2005 This paper may be cited as: Ross, Visitor counters in parks involves recording thBBe number of visitors passing counter during a specific period, and relating this to the number recorded by the instrument over the same time. Published by department of Conservation Wellington, New Zealand.

-Mohamed awwal hasheem , minna December , 2009, a thesis submitted to the department of electrical and computer engineering, federal university of technology. Design and construction of electronic door bell with counter and display .

1.4 Statement of the Problem:

In the last few years development of electronic circuits depend simulation technology then target of this projects design bell door an electronics counter for visitors practically by proteus simulation

1.5 Research layout:

There are four chapters in this project has and organized as follows : Chapter one introduction , Chapter two circuit components ,Chapter three Protues simulations and design **,** Chapter four discussion and conclusion.

Chapter Two

Circuit components

2.1 Introduction:

An electronic component is any basic discrete device or physical entity in an electronic system used to affect electrons or their associated fields. Electronic components are mostly industrial products, available in a singular form and are not to be confused with electrical elements, which are conceptual abstractions representing idealized electronic components.

Electronic components have two or more electrical terminals (or leads) aside from antennas which may only have one terminal. These leads connect to create an electronic circuit with a particular function (for example an amplifier, radio receiver, or oscillator). Basic electronic components may be packaged discretely, as arrays or networks of like components, or integrated inside of packages such as semiconductor integrated circuits, hybrid integrated circuits, or thick film devices. The following list of electronic components focuses on the discrete version of these components, treating such packages as components in their own right. We find that the electronics components, whether active, such as transistors and diodes or passive components such as resistors or capacitors and transformers as in Figure

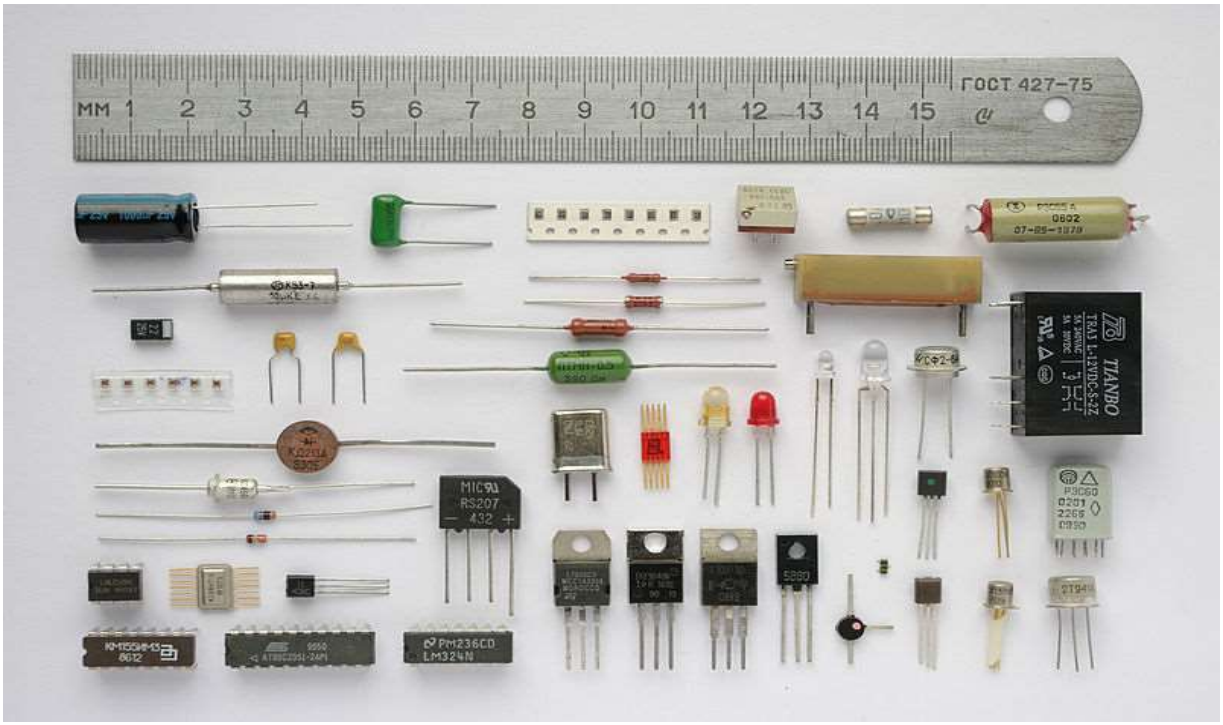

Figure 2.1 Electronic component

2.2 Circuit components:

The circuit consists of two circles are described as follows:

2.2.1 Bell Circle:

This circuit consists of resistors and integrated circuit HT 2811 and the transistor and the capacitor and the speaker and bell, we will talk in detail about the bell circuit components:

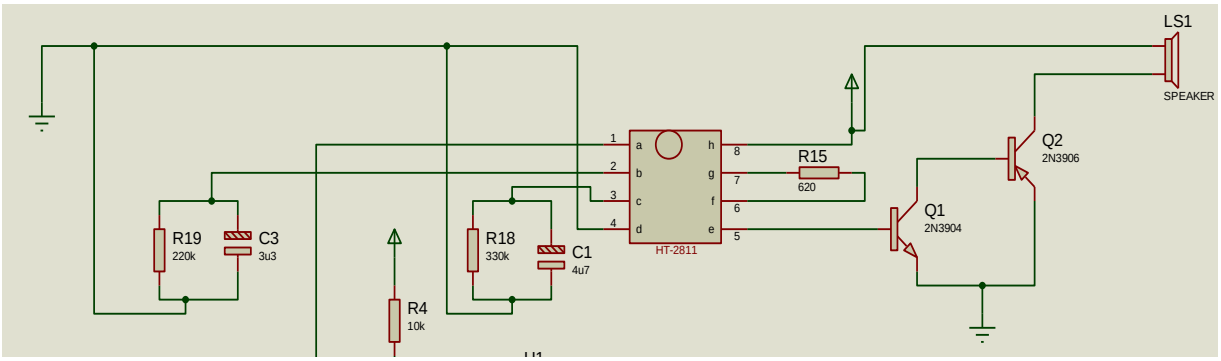

Figure 2.2 Bell Circle

2.2.1.1 Transistor (2N3904):

Is a common NPN bipolar junction transistor used for general purpose low-power amplifying or switching applications. The type was registered by Motorola Semiconductor in the mid-sixties, together with the complementary PNP type 2N3906, and represented a significant performance/cost improvement, with the plastic TO-92 case replacing metal cans. It is designed for low current and power, medium voltage, and can operate at moderately high speeds. This transistor is low cost, widely available and sufficiently robust to be of use by experimenters and electronics hobbyists.[2] When looking at the flat side with the leads pointed downward, the three wires emerging from the bottom are connected to, from left to right, the emitter, the base and the collector.[3] Some manufacturers mark "EBC" on the molded part, but all are required to have those connections for a part which is a "2N3904".[4]It is a 200 mA, 40 volt, 625 milliwatt transistor with a transition frequency of 300 MHz,[5] with a minimum beta or current gain of 100 at a collector current of 10 mA. It is used in a variety of analog amplification and switching applications.

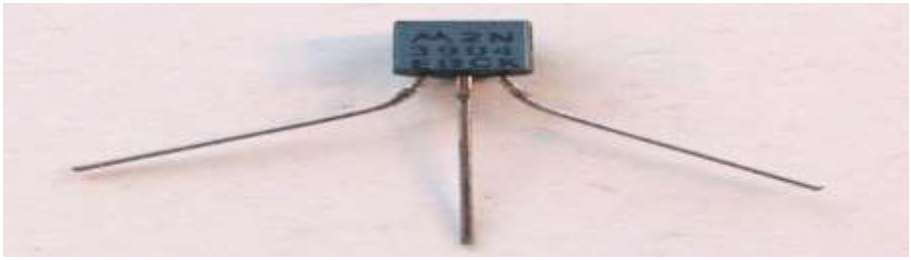

Figure 2.3 Transistors (2N3904)

Electrically similar devices, such as the MMBT3904, are available in a variety of small through-hole and surface mount packages including TO-92, SOT-23, and SOT-223, with package-dependent thermal ratings from 625 milliwatts to 1 watt.A 2N3906 is a complementary (PNP) transistor for the 2N3904. The

2N2222 is an NPN transistor that can safely switch three times as much current as the 2N3904 but has otherwise similar characteristics.[6] Nevertheless, in many applications such as variable frequency oscillators where lower currents are used to minimize thermal heating and consequent thermal drift of the fundamental frequency, the greater current capacity of the 2N2222 gives it no advantage. Whereas the 2N2222 is optimized to reach its highest gain at currents of around 150 mA, the 2N3904 is optimized for currents of around 10 mA .The 2N3904 is used very frequently in hobby electronics projects including home-made ham radios, code practice oscillators

2.2.1.2 Transistor (2N3906):

Is a commonly used PNP bipolar junction transistor intended for general purpose low-power amplifying or switching applications. It is designed for low electric current and power and medium voltage, and can operate at moderately high speeds.

The 2N3906 is manufactured in a plastic TO-92 case. When looking at the flat side with the leads pointed downward, the three leads emerging from the transistor are, from left to right, the emitter, base, and collector leads.

The 2N3906 is specified by a collector current of 200 mA, collector-base and collector-emitter voltages of 40 V, for power dissipation of 300 mW. Its transition frequency Ft is 250 MHz, with a beta of at least 100.[7]The complementary NPN transistor to the 2N3906 is the 2N3904. Both types were registered by Motorola Semiconductor in the mid-1960s.

Figure 2.4 Transistor (2N3906)

2.2.1.3 Integrated circuits (HT2811):

Is a CMOS LSI chip specilly designed for the application of ding - dong door bell . It requir very low nomber of external component and provide low cost, high quality dual tone ding - dong sound. The IC is very suitable for door bell application.

2.2.1.4 Speakers:

Is one of the most common output devices used with computer systems. Some speakers are designed to work specifically with computers, while others can be hooked up to any type of sound system. Regardless of their design, the purpose of speakers is to produce audio output that can be heard by the listener.

Speakers are transducers that convert electromagnetic waves into sound waves. The speakers receive audio input from a device such as a computer or an audio receiver. This input may be either in analog or digital form. Analog speakers simply amplify the analog electromagnetic waves into sound waves. Since sound waves are produced in analog form, digital speakers must first convert the digital input to an analog signal, and then generate the sound waves.

2.2.1.5 Resistor:

Is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses. High-power resistors that can dissipate many watts of electrical power as heat may be used as part of motor controls, in power distribution systems, or as test loads for generators. Fixed resistors have resistances that only change slightly with

Temperature, time or operating voltage. Variable resistors can be used to adjust circuit elements (such as a volume control or a lamp dimmer), or as sensing devices for heat, light, humidity, force, or chemical activity.

Resistors are common elements of electrical networks and electronic circuits and are ubiquitous in electronic equipment. Practical resistors as discrete components can be composed of various compounds and forms. Resistors are also implemented within integrated circuits.

The electrical function of a resistor is specified by its resistance: common commercial resistors are manufactured over a range of more than nine orders of magnitude. The nominal value of the resistance falls within the manufacturing tolerance, indicated on the component

Figure 2.5 resistors

2.2.1.6 Capacitors:

A capacitor is a passive two-terminal electrical component that stores electrical energy in an electric field.[8] The effect of a capacitor is known as capacitance. While capacitance exists between any two electrical conductors of a circuit in sufficiently close proximity, a capacitor is specifically designed to provide and enhance this effect for a variety of practical applications by consideration of size, shape, and positioning of closely spaced conductors, and the intervening dielectric material. A capacitor was therefore historically first known as an electric condenser.[9]

Some different capacitors for electronic equipment Capacitors store and release electrical charge. They are used for filtering power supply lines, tuning resonant circuits, and for blocking DC voltages whi le passing AC signals, among numerous other uses.

Figure 2.6 type of Capacitors

2.2.2 Counter circuit:

Counter circuit consists of integrated circuit in 4026 and two buttons, one starts counting, and the other is because the meter to zero also consists of resistors and the capacitor are illustrated as follows*:*

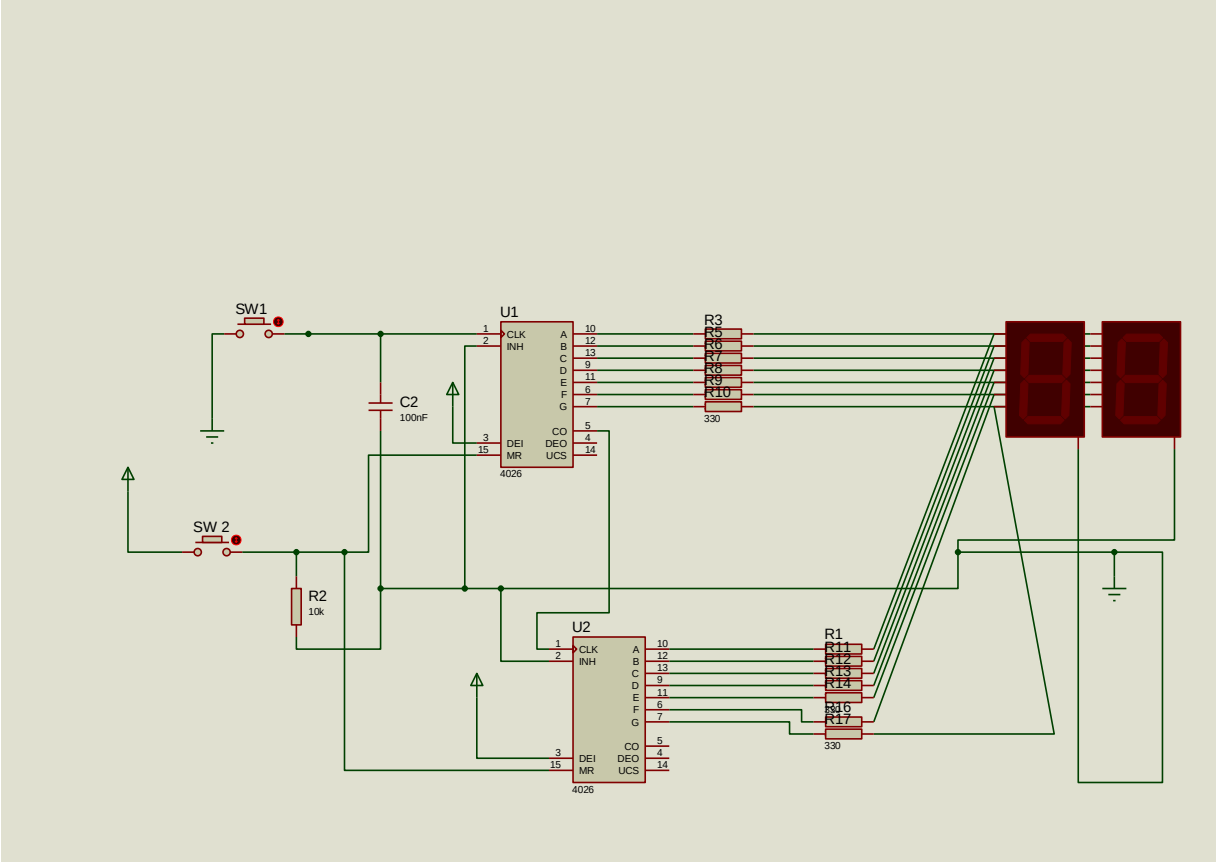

Figure 2.7 Counter circuit

2.2.2.1 Button:

The machine that presses them in ringing the bell and also the head of the power switch moves if the pressure rang.

Figure 2.8 button

2.2.2.2 Integred circuit:

An integrated circuit (IC) is available called a 4026 which allows you to build a counter that will increase its value every time it receives a clock pulse. This pulse could come from a switch of some kind or the output of another circuit, like a stable circuit for example.

Figure 2.9 Integrated circuits

2.2.2.3 Counter:

A 7-Segment display is made up of seven rectangular LEDs arranged in a figure of 8 patterns. By lighting up the LEDs in the right order it is possible to get them to display the numbers 0 to 99.

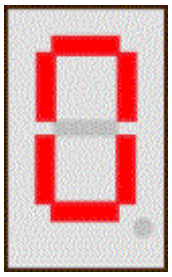

Figure 2.10 Counter

2.2.3 Main circuit:

For pressing pressure Bell Press issued the sound of the loudspeaker 1 LS and go pulse to the entrance of the counter 4026 and the network consisting of R 220K and C 47uf and R 2K2 benefit in the first two works is to provide a pulse count when every keystroke and the second is regarded clicks repeated bell which are not separated by an interval appropriately be considered pulse count one.

Can be an additional show with other 4026 integrated circuit box is put on to conduct the entrance to count them, where issued the first integrated circuit pulse at each transition of the number "0" to the number "99" to prepare the two circles complementing enumerators (the number of double-digit) where the user connects the button 1 to illuminate the screen and see the number of visitors the button 2 is to return the counter to "0" and must know that if Do not show on the screen stays internal counter retains the digital value and accept the new meters

as well as upon the arrival of the meter to the highest numeric value of "9" it will return to the value "0 "when pressure following the bell, See Figure follows:

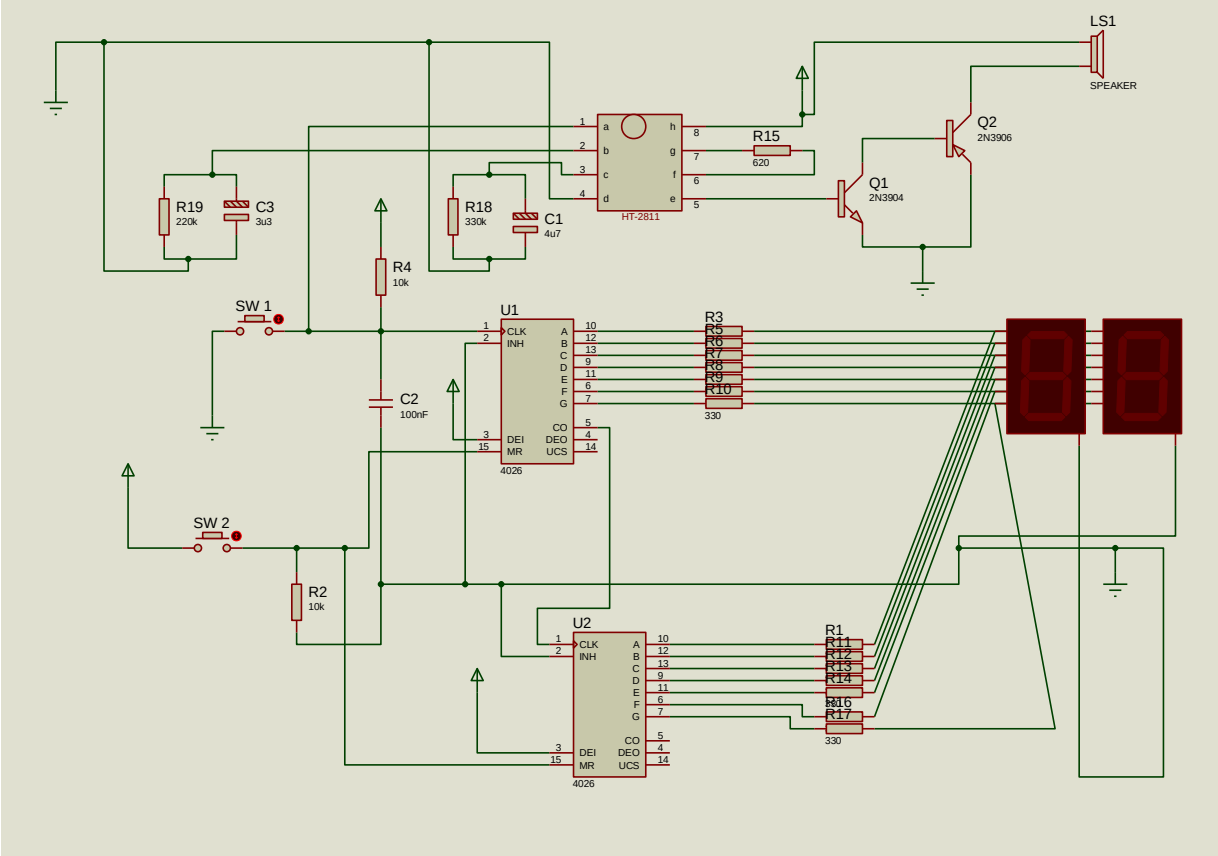

Figure 2.11 Main circuit

Chapter Three

Protues Simulations and Design

3.1 Introductions:

Simulation is a powerful tool for analyzing, designing, and operating complex systems. It enables you to test hypotheses without having to carry them out, saving you thousands, even hundreds of thousands of dollars!

It is a cost-effective means of exploring new processes, without having to resort to pilot programs. Simulation provides a method for checking your understanding of the world around you and helps you produce better results faster. And it is an efficient communication tool, showing how an operation works while stimulating creative thinking about how it can be improved.

3.2 Simulation is Important :

Simulation provides a method for checking your understanding of the world around you and helps you produce better results faster. A simulation program like Extends Sim is an important tool that you can use to:

- Predict the course and results of certain actions.
- Understand why observed events occur.
- Identify problem areas before implementation.
- Explore the effects of modifications.
- Confirm that all variables are known.
- Evaluate ideas and identify inefficiencies.
- Gain insight and stimulate creative thinking.
- Communicate the integrity and feasibility of your plans.

3.3 protues definition:

Proteus is to take you through the process of entering a circuit of modest complexity in order to familiarize you with the techniques required to drive the schematic capture module in Proteus (ISIS). The tutorial starts with the easiest topics such as placing and wiring up components, and then moves on to make use of the more sophisticated editing facilities, such as creating new library parts

3.4 protues program and design:

For pressing pressure Bell Press issued the sound from the loudspeaker LS 1 and go to the entrance of a pulse counter 4026 and the network consisting of R 220K and C 47uf and R 2K2 and give something counting

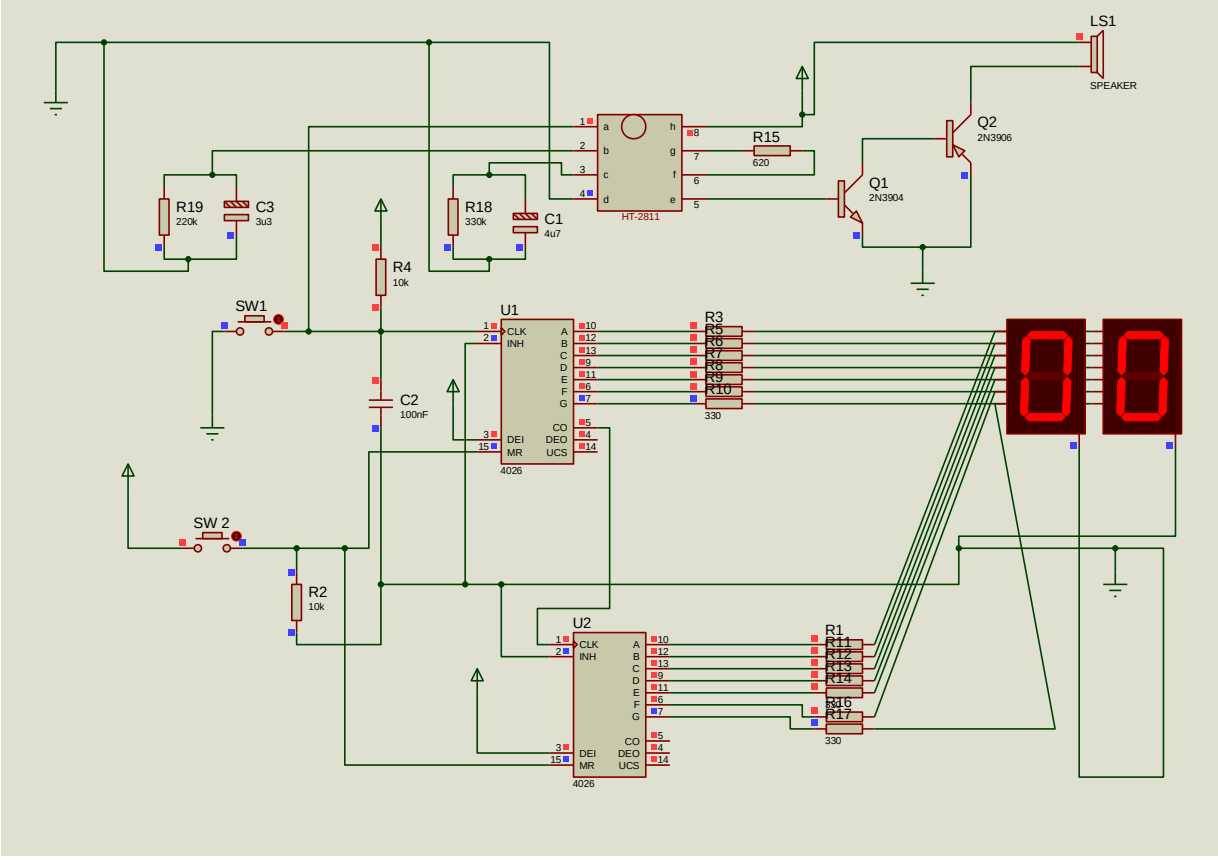

Fig 3.12 schematic circuit

Can be an additional show with other 4026 integrated circuit box is put on to conduct the entrance to count the previous circle where issued the first integrated circuit pulse when this director at each transition of the number "0" to the number "99" to prepare the two circles complementing enumerators number of double-digit.

To save battery power, the manifestation screen qualifies enabled or prevent disabled by sw1 shown in the figure, where the user connects this button sw1 to illuminate the screen and see the number of visitors the sw button 2 is to return the counter to "0" and must know that if Do not show on the screen stays counter key interior retains the digital value and accept the new meters as well as upon the arrival of the meter to the highest numeric value "99" it will return to the value "0" when pressed following the bell.

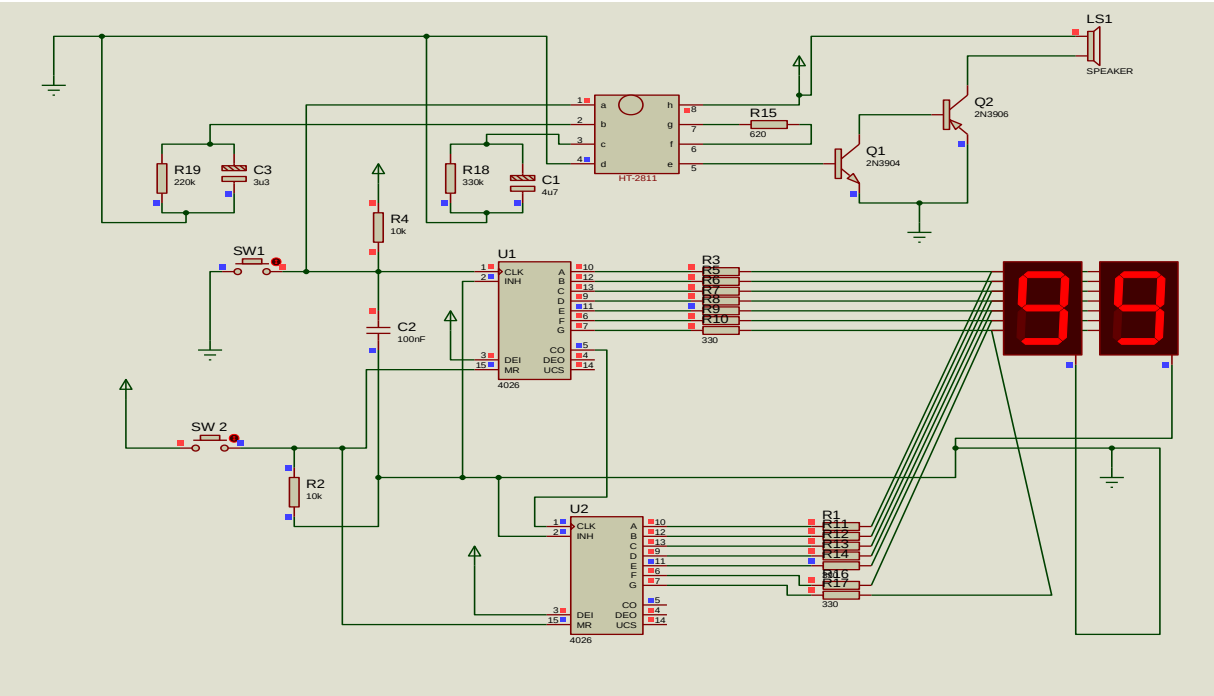

Fig 3.13 schematic circuit

Chapter Four

Discussion and Conclusion

4.1 Introductions:

In this last chapter dealt with the results obtained by the door bell letter is a device that works to calculate the number of visitors and the device is equipped with counter numbers shows through its screen for ways Proteus program.

4.2 Discussion:

The purpose of this tutorial (protues) is to show you how to conduct an interactive simulation with a microcontroller using Proteus VSM and the VSM Studio IDE. The emphasis will be on practical usage of the simulator and IDE, with more detailed coverage of each topic being available in the reference manuals, when you press the button one is to send a pulse counter for counting comes one step at the same time, the announcement of the bell circle who shall derail the voice of all the button uncompleted repetition the process is repeated any increase of the counter counting steps, when you press the two button re-entry of the counter to put zero.

4.3 Conclusion:

Account was built by Proteus program and can control the time duration for which it keeps ringing upon pressing the switch. Also can control the oscillation frequency of "doorbell sound" sound produced by the Doorbell.

4.4 Recommendations :

We used enumerators possible and anyone who uses more than enumerators by the number of visitors expected.

Proportion to the lack of an integrated circuit HT2811 not exist in the program Brocaoslm not remove the voice through the headset so I hope in future studies that are output ringtone by Proteus program.

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