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"TECHTODAY "

TECHNICAL MAGZINE 2022-23

DEPARTMENT OF BASIC SCIENCE & HUMANITIES

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I am happy and glad that Department of Basic Sciences & Humanities is releasing out Technical magazine. Proper communication plays a vital role in institution's development. This technical magazine will serve to reinforce and allow increased awareness, improved interaction and integration among all of us. The journey from the inception of technical magazine to its final form in your hands has been wonderful joyful for every member of the technical magazine family that has given their best to accomplish this momentous task.

Happy Reading!

Vision and Mission of the department:

➢ VISION

To be a center of excellence by imparting lifelong learning attitude through dissemination of basic technical and professional knowledge amongst students for the accomplishment of ever-growing needs of society.

➢ MISSION

- To inspire and motivate promising engineers by catering quality education through effective teaching learning methodologies.
- To develop professional skills and right attitude in students that will help them to succeed and progress in their personal and professional career.
- To imbibe moral and ethical values in students with concern to society and environment.

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TOUCH SENSOR SYSTEM

(**Ms. Ayesha Birambole, Ms.Samruddhi Desai, Ms. Dnyaneshvari Gurav, Ms.Mayuri Jadhav, Ms.Yogita Kulavmode**)

INTRODUCTION

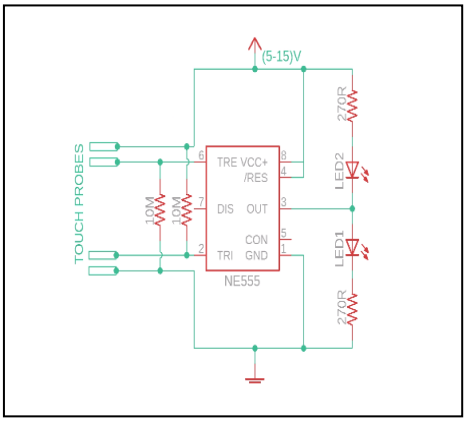
A project on how to make a Touch On and Touch Off sensor switch using 555 timer IC on a breadboard. This circuit uses two pairs of touch conductors to sense and register the touch. One pair of touch conductors (sensors) for turning ON the output and the other pair for turning OFF the output.

The 555 timer IC is an integrated circuit (chip) used in a variety of timer, delay, pulse generation, and oscillator applications. Derivatives provide two (556) or four (558) timing circuits in one package.[2] The design was first marketed in 1972 by Signetics and used bipolar junction transistors. A touch sensor is a type of device that captures and records physical touch or embrace on a device and/or object. It enables a device or object to detect touch or near proximity, typically by a human user or operator. Touch sensing input devices offer numerous possibilities for novel interaction techniques and it reliably replaces mechanical buttons and switches to eliminate mechanical wear and tear. These can be configured into simple sliders, rotary wheels, or touch pads for intuitive user interfaces.

A touch sensor primarily works when an object or individual gets in physical contact with it. Touch sensors are also called as tactile sensors and are sensitive to touch, force or pressure. It can be implemented using Capacitive or Resistive sensing technology. Capacitive sensing is a technology based on capacitive coupling that can detect and measure anything that is conductive or has a dielectric difference from air. Capacitive touch screens distinguish and sense specific touch location based on the electrical impulses in a human body, typically the fingertip. This enables capacitive touch screens

COMPONENTS REQUIRED

- 555 Timer IC
- 1 or 2 LED’s
- Resistors 2 x 10M, 2 x (The series resistor for LED’s)
- Breadboard
- Few Breadboard Connectors
- (5-12)V Power Supply



COMPONENTS DETAILS:-

1. 555 Timer IC :- Voltage divider: Between the positive supply voltage VCC and the ground GND is a voltage divider consisting of three identical resistors (5 kΩ for bipolar timers, 100 kΩ or higher for CMOS) to create reference voltages for the analog comparators. CONTROL is connected between the upper two resistors, allowing an external voltage to control the reference voltages:

2. Threshold comparator: The comparator's negative input is connected to voltage divider's upper reference voltage, and the comparator's positive input is connected to THRESHOLD.
3. Trigger comparator: The comparator's positive input is connected to voltage divider's lower reference, and the comparator's negative input is connected to TRIGGER.
4. Latch: A set-reset latch stores the state of the timer and is controlled by the two comparators. RESET overrides the other two inputs, thus the latch (and therefore the entire timer) can be reset at any time.
5. Output: The output of the latch is followed by an output stage with push–pull output drivers that can supply up to 200 mA for bipolar timers, lower for CMOS timers.
6. Discharge: Also, the output of the latch controls a transistor acting as an electronic switch that connects DISCHARGE to ground (convenient for discharging a timing capacitor) or leaves it disconnected.
7. RESISTORS 2 x 10M, 2 x (THE SERIES RESISTOR FOR LED'S):- A 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.
6. (5-12)V Power Supply :- The nine-volt battery, or 9-volt battery, is an electric battery that supplies a nominal voltage of 9 volts. Actual voltage measures 7.2 to 9.6 volts, depending on battery chemistry. Batteries of various sizes and capacities are manufactured; a very common size is known as PP3, introduced for early transistor radios.

WORKING METHODOLOGY

The 555 timer IC has two sensing pins and one output pin. The sensing pins are Pins 2 & 6 (named as Trigger Pin and Threshold Pin) and the output is Pin-3. The internal architecture of the 555 timer IC is such that, whenever Pin-2 (Trigger Pin) senses a voltage less than 1/3rds of supply voltage, it turns ON the output. Similarly when Pin-6 (Threshold Pin) senses a voltage greater than 2/3rds of supply voltage, it turns OFF the output.

For example, if the supply voltage is 9V, 1/3rds of it is 3V and 2/3rds of it is 6V. So if the trigger pin senses a voltage less than 3V, it turns ON the output & similarly if the threshold pin detects a voltage more than 6V, it turns OFF the output. The circuit diagram shown above, Pins 2 & 6 are connected via 10M resistors to the opposite polarities of what affects them, to keep the output stable. Since Pin-6 changes the output if it sees more voltage, it is connected to 0V through 10M resistor by default.

Similarly is with Pin-2 to prevent unnecessary triggers by static charges. So Whenever someone touches the contacts at Pin-2 and 0V, since Pin-2 senses ~0V because of current flowing though finger, it turns ON the output. And when we touch the contacts at Pin-6 and +ve Voltage, since Pin-6 senses ~+ve Voltage (which is more than 2/3rds of supply voltage), it turns OFF the output. Also the influence of 10M resistor is negligible when we touch the contacts with our finger, since the resistance at the finger will be much lesser. And in this manner you can continue turning ON and OFF the output with just a touch of your finger!!

ADVANTAGES IN DAILY LIFE

 Capacitor sensors are easily available and are of very low cost.

 These sensors are highly used in mobile phones, iPods, automotive, small home appliances, etc…

 These are also used for measuring pressure, distance, etc…

 A drawback of these sensors is that they can give a false alarm.

 Resistive touch sensors only work when sufficient pressure is applied. Hence, these sensors are not useful for detecting small contact or pressure.

 These are used in applications such as musical instruments, keypads, touch-pads, etc.. where a large amount of pressure is applied.

Hand Free Faucet

(Nikhat A. Mulla, Priyavanda P. Patil, Sakshi v.Suryawanshi,

Sanjana E. Patharwat, Ankita J. Yadav)

INTRODUCTION :

Hand hygiene is a major requirement for human health. Many infectious diseases can be emerged if proper hand hygiene procedures are not implemented. The infectious diseases, which are caused by hand non-hygiene, are viruses (hepatitis A, polio), bacteria (typhoid, fever, dysentery).Furthermore, the impact of hand non-hygiene can increase pandemic public health such as severe acute respiratory syndrome and avian influenza in the community. Many studies have also been reported an association between improvements in hand hygiene and reductions in rates of infectious illness. The Medline database was searched from January 1980 to June 2001 shows the relation between hygiene practices and relative reduction in risk of illness is greater than 20%.

Hand washing is the simplest, important and cost-effective way to improve hand hygiene in health care and support the prevention of infectious disease. The WHO standard obligates people for hand washing with non-antibacterial soap and water. The duration ranged on average as short as 20 seconds to 30 seconds, including rub the backs of hands, wrists, between fingers and under fingernails . Hand washing with soap and water is more effective for the removal of bacteria than washing with water alone to 23% .

Studies show that the compliance of hand-washing procedures by healthcare workers, householder and officer are only about 40%, and then barely reaches 50% even after various educational trainings or interventions .

A study also showed that the average duration of scrubbing was less than 15 seconds in the community

So we have introduce the automatic hand free faucet .

WORKING PRINCIPLE OF SOLENOID VALVE:

A solenoid valve consists of two basic units: an assembly of the solenoid (the electromagnet) and plunger (the core), and a valve containing an orifice (opening) in which a disc or plug is positioned to control the flow of fluid.

1. The valve is opened or closed by the movement of the magnetic plunger.

2. When the coil is energized, the plunger is drawn into the solenoid (electromagnet) and flow through the orifice is allowed.

3. The valve returns automatically to its original position when the current ceases due to the pressure of spring and flow through the orifice is restricted.

4. The valve body is usually a special brass forging that is carefully checked and tested to ensure that there will be no leakage due to porosities. The armature, or plunger, is made from high-grade stainless steel.

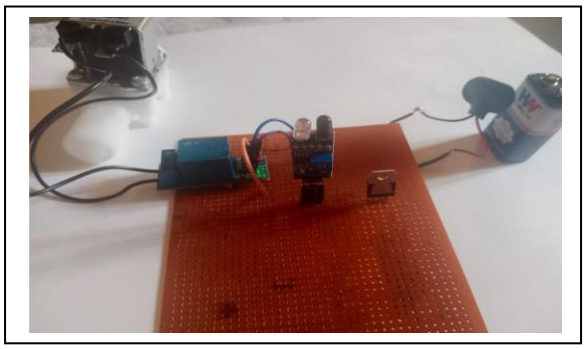
5. The effects of residual magnetism are eliminated by the use of a kickoff pin and spring, which prevent armature from sticking.

6. A shading coil ensures that the armature will make a complete seal with the flat surface above it to eliminate noise and vibration.

7. To ensure that the valve will always seat properly the strainers should be used to prevent grit or dirt from lodging in the orifice. Dirt in these locations will cause leakage.

8. The inlet and outlet connections of the valve must not be reversed. The tightness of the valve depends to a degree on the pressure acting downward on the sealing disc. This pressure is possible only when the inlet is connected to the proper point as indicated on the valve.

9. In this way we have used this valve in Hand Free Faucet.



How does the IR proximity sensor works:

1. The IR emitter LED emits infrared continuously.
2. When any object comes within the range, the infrared falls on that object and some amount of infrared reflects from that object.
3. Then the reflected infrared sensed by the IR receiver LED.
4. The voltage across the IR receiver LED changes proportional to the amount of reflected infrared.
5. Then we compare the voltage with the predefined value by the LM358 comparator.
6. If the voltage crosses the predefined limit the output pin of the LM358 IC becomes high. Thus the IR proximity sensor can detect the presence of the nearby objects without any physical contact.
7. In hand free faucet we have used IR sensor

PCB CONNECTION

A zero printed circuit board or PCB is used for Electronic and communication support and electrically connect electronics Component using conductive pathway, tracks or signals traces etched from copper sheets laminated to a non-conductive substrate The PCB Is printed circuit board having circuit made with

upper layer on the plate there are various steps to design a PCB for that the basic thing required is circuit .so, the circuits required for the system .

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SMART STICK FOR BLIND PEOPLE

(Miss. Patil Greeshma ,Miss. Patil Madhura ,Miss. Kurne Alfiya ,Miss. Mujawar Saniya ,Miss. Khot Sanika)

Abstract

The project "Smart Stick for Blind People" describes ultrasonic blind walking stick with the use of arduino. According to WHO, 30 million people are permanently blind and 285 million people with visual impairment. If we notice them, we can very well know about that they cannot walk without the help of others, one has to ask guidance to reach their destination. They have to face many struggles in their daily life. Using this smart stick, a person can walk more confidently. This stick detects the object in front of the person and give response to the user by the beeping voice so, the person can walk without any fear. This device will be the best solution to overcome their difficulties.

Objectives

❖ To identify the solid objects and people within one-meter range.

❖ To identify the motion objects like vehicles which are coming towards the person.

❖ Send audio messages to inform above two functions.

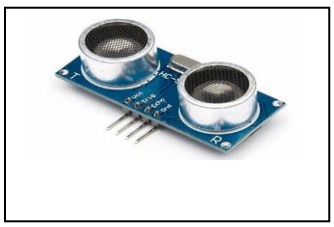
Hardware and Software Requirements

Ultrasonic Sensor:

HC-SR04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do. It offers excellent non-contact range detection with high accuracy and stable readings in an easy to use package from 2 cm to 400 cm or 1" to 13 feet. The operation is not affected by sunlight or black material, although acoustically, soft materials like cloth can be difficult to detect. It comes complete with ultrasonic transmitter and receiver module.

Specifications:

• Power Supply: +5V DC
• Quiescent Current: <2Ma
• Working Current: 15Ma
• Efficient Angle: <15 degree

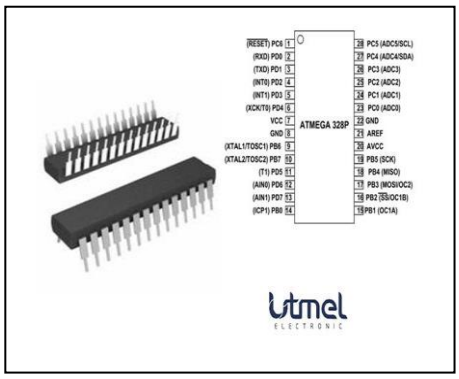


• Ranging Distance: 2 cm-400 cm/1”-13 feet
• Resolution: 0.3 cm
• Measuring Angle: 30 degree
• Trigger Input Pulse Width: 10Us
• Dimensions: 45mm x 20mm x 15mm

Buzzer:
A buzzer is a small yet efficient component to add sound features to our project/system. It is very small and compact 2-pin structure hence can be easily used on PCB which makes this a widely used component in most of the electronic applications. This buzzer can be used by simply powering it using DC power supply ranging from 4V to 9V. A simple 9V battery can also be used, but it is recommended to use a regulated +5V or +6VDC supply.
Specifications:
• Rated voltage: 6V DC
• Operating Voltage: 4-9V DC
• Rated Current: <30Ma
• Sound Type: Continuous beep
• Resonant Frequency: ~2300 Hz
• Small and neat sealed package
• Breadboard and Perf board friendly

Arduino IC (ATmega328P):

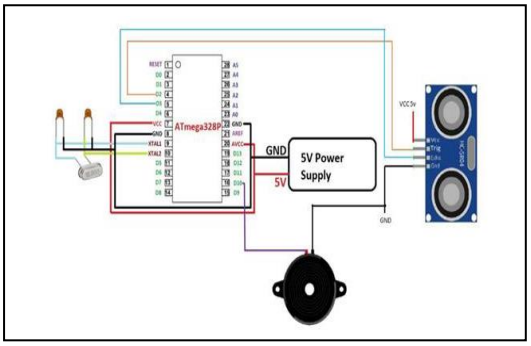
It is a high performance ,low power controller from Microchip. This blog mainly introduces its pinout, datasheet, applications and other detailed information of ATMEGA328P. The ATmega328P is low power, CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture.
Specifications:



• Low power consumption
• Total number of analog input pins are 6
• Contains 32 kilobytes of flash memory
• Contains 2 kilobytes of SRAM
• Contains 1 kilobytes of EEPROM
• 16 mega Hz clock speed
• Minimum and maximum temperature -40 degree centigrade to 105 degree centigrade
• Total number of digital I/O pins are 14
• Advance RISC • Lock program functionality for programming code security
• Contains total three timers two 8-bit and one 16-bit
• Total number of I/O pins are 23
• Total number of PWM channels are 6

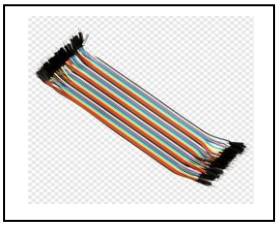
• Minimum and maximum operating voltage from 1.8V DC to 5.5V DC

Future Scope: GPS can help visually impaired people to source and destination route information. • GPS can help to find the shortest and best path as accordingly to Google/Bing map based on real time. • GSM attachment can help in future for any immediate causality



4. Jumper Wires:

• The jumper wires are the electric wires that connects remote electric circuits used for PCB.



5. Switch:

• The switch is a key building blocks for any network. They connect multiple devices. It enables connected devices to share information and talk to each other.

6. Battery and the Connector:

• A battery is used to store, accept and release electricity on demand.
A battery connector is a gadget that combines electric circuits.

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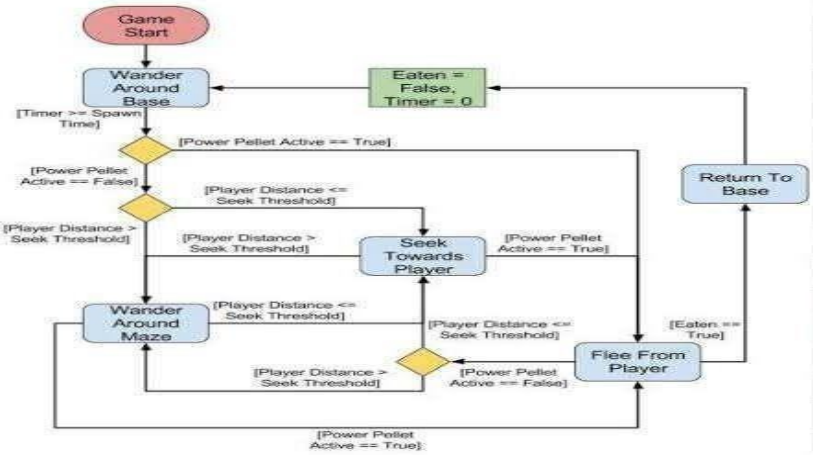
PACMAN IN C

(Sumit S. Asalkar, Tejas A. Godase, Parth S. Jadhav, Niranjan U. Mali, Aasif A.Shaikh)

ABSTRACT

Our project is a simple Pac-man game-engine programmed in C. The game will require software programming in C. When completed our game will be connected to a PC and take game input from the keyboard and display the graphic results on a PC monitor. The rough breakdown of our game will consist of game logic, graphics engine, and I/O. The game logic will consist of collision detection, scoring, and enemy AI. The graphics engine will include sprite rendering onto the display. The I/O will include mostly interaction with the keyboard and if we have time maybe a joystick. Currently our plan is to implement the game logic in software and the graphics engine on the hardware. If additional time is available to us, we would like to also implement audio game features within our project.

FLOW CHART



Variable Name	Variable Definition
Spawn Time	The amount of time a ghost must wait before exiting the base
Timer	A timer on the ghost that is compared to Spawn Time
Power Pellet Active	Whether or not the player has just eaten a Power Pellet
Player Distance	The distance between the player and the current ghost
Seek Threshold	The maximum distance from the player the ghost can be to seek the player
Eaten	Whether or not a ghost has been eaten

Symbol	Definition
	Terminal
	State
	Decision
	Process
	Transition
[asdfx]	Condition

CONCLUSION

Throughout the development process, we successfully implemented the key features such as maze generation, character movement, collision detection, score tracking, and game over conditions. These components allowed us to recreate the classic Pacman game play and deliver an enjoyable user experience. Through careful planning, modular code design and effective debugging techniques, we were able to overcome the hurdles like complexity of game logic and achieve a functional and playable game. Overall the project has provided valuable insights into the world of game development and sharpened our programming skills in C. It has given us a deep understanding of key programming concepts such as data structures, algorithms and event-driven programming. Additionally, it has allowed us to appreciate the importance of planning, organization, and teamwork in the development process. In conclusion, the development of Pacman game in C had a fulfilling and educational experience. We are proud of the accomplishments achieved through this project and we believe that it has laid a solid foundation for future endevours in game development and software engineering.

CAR RENTAL SYSTEM

(Sanika S. Bhatage, Aditi A. Gurav, Prachi Vijay Patil, Sharvari Krishna Varekar)

ABSTRACT

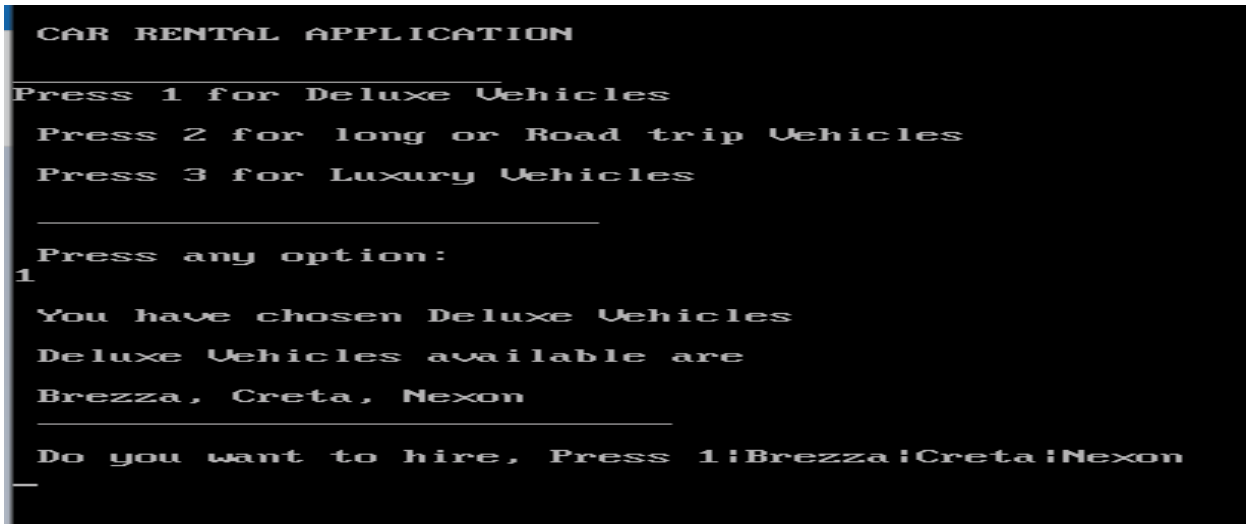
Our Aim is to design and create a data management System for a car rental company. This enables admin can rent a vehicle that can be used by a customer. This system increases customer retention and simplify vehicle and staff Management in an efficient way .

This software Car Rental System has a very user friendly interface . Thus the users will feel very easy to work on it . By using this system admin can manage a customer confirm and cancel booking request, customer Testimonials , customer issues. The car information can be added to the system . Or existed car information can be edited or deleted too by administrator. There is no delay in the availability of any car information, whenever needed, car information can be captured very quickly and easily.

The customers can also use the system to get car rent. The customer should create a new account before logging in or he/she can log into the system with his/her created account. Then he/she can book the available cars and can book this car. This system will helpful to the admin as well as to the customer also.

FLOWCHART

OUTPUT



ADVANTAGES

1. Online booking made simple and Instant.

2.Effective fleet management.

3.Automatic fare calculation.

4.Fuel consumption tracking.

5.Be informed with the customer and driver information.

6.Billing made easy.

7.Round the clock availability.

8.Anti- Theft alert.

9.Keep track of Fleet maintenance and damage.

10.Track the car availability.

11.Provide more convenience.

CONCLUSION

In comparison to previous experiences, when every activity related to the vehicle rental system business was restricted to a physical place alone, the car rental industry has emerged with new delicacies. Even if the physical location has not been completely eliminated, the internet's power has altered the nature of functions and how this task is accomplished. Customers may now book vehicles online, rent automobiles online, and have the car delivered to their home if they are a registered member, or they can travel to the office to pick up the car.

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ICE –CREAM PARLOUR BILLING

(Piyusha Santosh Awate, Rutuja baban chougule, Sanjana sambhaji Magdum, Sakshi ajit kognole , Anuradha popat patil, Namrata mahavir patil)

ABSTRACT

This project presents an ice cream parlor billing system implemented using the C programming language. The system aims to automate the billing process at an ice cream parlor by providing a user-friendly interface for customers and efficiently handling their orders and payments. The ice cream parlor billing system offers various features, including menu selection, order customization, pricing calculation, and generating a detailed bill for each customer. It allows customers to choose from a wide range of ice cream flavors, toppings, and serving sizes.

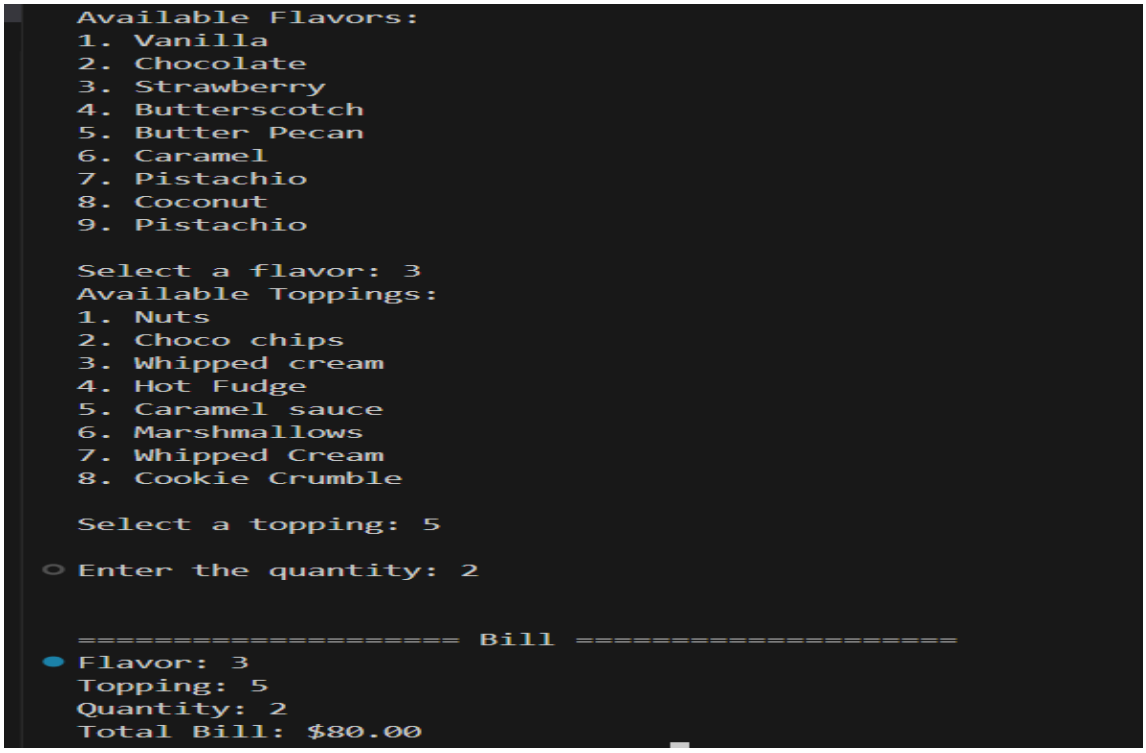
The implementation utilizes fundamental programming concepts such as variables, conditional statements, loops, and functions to ensure an efficient billing process. The system prompts the user for their order details, validates the inputs, and updates the bill accordingly. It also incorporates error handling to prevent invalid input and ensures accurate calculations.

Furthermore, the billing system maintains a record of all transactions, including the customer's name, order details, and the total amount paid. It provides the functionality to retrieve and view previous bills, facilitating easy reference and analysis of customer transactions.

Overall, the ice cream parlor billing system implemented in C programming provides a streamlined and automated solution for managing the billing process, improving efficiency and enhancing the overall customer experience at the ice cream parlor.

PROBLEM STATEMENT

To reduce the paper work of ice cream parlor, order & billing, we developed the application that reduces human efforts by taking online order and produces bill.



BENEFITS:

- Increased efficiency: The automated billing system reduces manual effort, minimizes errors, and speeds up the billing process.

- Improved accuracy: By automating calculations and eliminating human errors, the system ensures accurate billing and reduces discrepancies.

- Enhanced customer experience: The user-friendly interface and streamlined payment options create a seamless experience for customers, resulting in higher satisfaction levels.

- Business insights: The generated reports and analytic provide valuable insights into the ice cream parlor's performance, enabling informed decision-making and targeted marketing strategies.

OVERVIEW

The ice cream parlor billing system is an all-in-one solution that enables the parlor staff to manage the entire billing process, including order placement, calculating costs, generating bills, and maintaining records. The system will also facilitate a seamless experience for customers by providing a quick and hassle-free payment process.

CONCLUSION

The Ice Cream Parlor Billing System aims to modernize and optimize the billing process in an ice cream parlor, benefiting both the staff and customers. By automating various tasks, the system ensures efficiency, accuracy, and a superior customer experience. With its comprehensive features, the system assists in managing billing operations, tracking sales, and making data-driven business decisions, ultimately contributing to the success of the ice cream parlour.

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FROM STUDENT EDITOR'S DESK:

In this issue, "TechToday" - Technical Magazine 2022-23, we continue exploring the latest advancements, innovative technologies, and insightful research that shape the future of engineering. It's a field where creativity meets precision, where theoretical concepts translate into practical applications, and where collaboration across disciplines drives ground breaking innovations.

Our articles offer in-depth analyses, practical insights, and real-world applications, providing readers with valuable perspectives to navigate the dynamic landscape of engineering. As the field continues to evolve at a rapid pace, it's crucial for professionals, researchers, and enthusiasts to stay updated about the latest trends and developments.

Through this magazine, we aim to foster knowledge exchange, spark inspiration, and promote dialogue .We extend our sincere gratitude to all the contributors, and readers who have contributed to making this magazine a platform for sharing knowledge and fostering innovation. We hope you find this issue informative, engaging, and inspiring. Happy reading!

Best Regards,

Piyusha Santosh Awate

F.Y. B.tech.

EDITOR MESSAGE:

It is with great enthusiasm that I present “TechToday” - Technical Magazine 2022-23” This magazine serves as a platform to explore the ever-evolving landscape of engineering, bringing together the latest advancements, innovative technologies, and insightful research that shape the future of engineering.

Through this magazine, we aim to provide in-depth analyses, practical insights, and real-world applications that will enrich the knowledge of students, researchers, and professionals alike. As technology advances at an unprecedented pace, staying informed about the latest trends and developments is crucial.

" TechToday " aspires to be a catalyst for knowledge exchange, inspiration, and intellectual discussions within the engineering community. I extend my heartfelt gratitude to all the contributors, authors, reviewers, and readers who have played a significant role in making this magazine a valuable resource. Your efforts and enthusiasm drive the success of this initiative. I hope you find this edition insightful and engaging.

Mrs. D. A. Karwa

Assistant Professor,

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Sharad Institute of Technology, College of Engineering.