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by L Vinay Kumar Reddy

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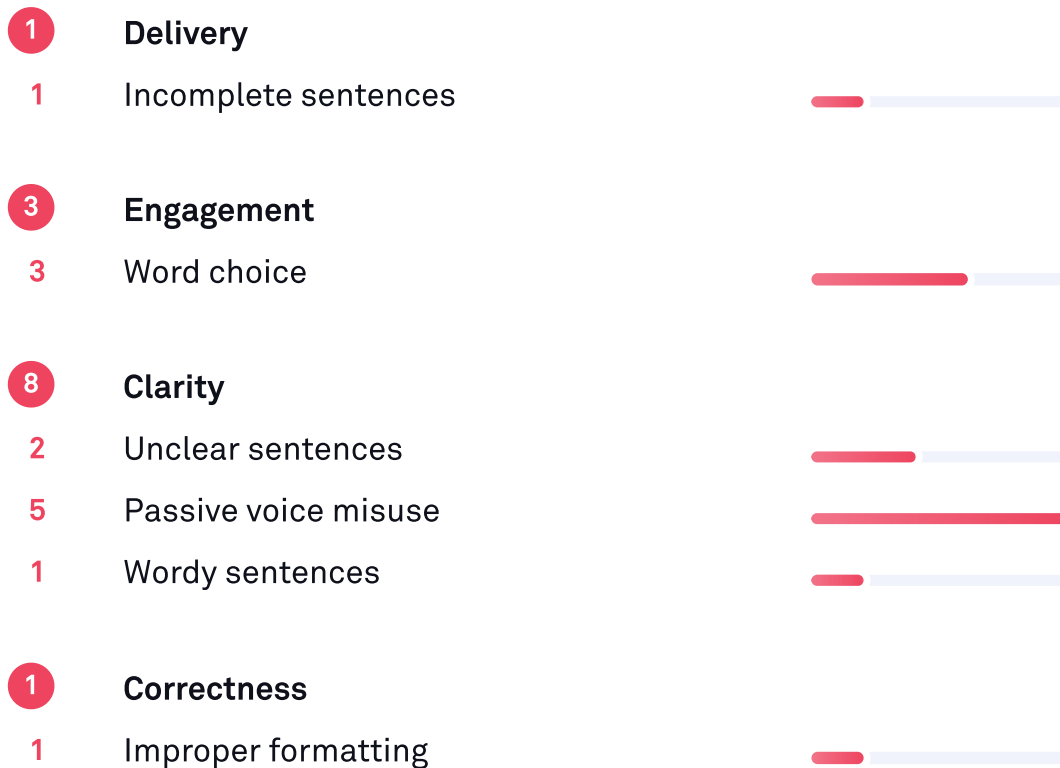
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Interactive Touch Me Not Game: Arduino UNO and Closed Circuit Principles

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Abstract—**This research paper explores the innovative integration of electronics and gaming by implementing a closed circuit current passing mechanism within the popular game "Touch Me Not" using the Arduino Uno microcontroller. "Touch Me Not" is a classic electronic game that challenges players to complete a circuit without touching the wire in the middle with the copper handle. Traditionally, this game relies on passive components like wires and metal contacts. This study presents a novel approach by incorporating the Arduino Uno platform to enhance the gameplay experience and educational value.**

Keywords— Arduino UNO, circuit, component, pins

1. INTRODUCTION

In this paper, we present an implementation of the current passes through a closed circuit principle using Arduino UNO. Arduino UNO is a microcontroller board that can create interactive electronic devices.

Our implementation of the current passes through a closed circuit principle using Arduino UNO consists of a simple circuit with a switch, a buzzer, and an LED. When the switch is closed, the current flows through the course, the buzzer beeps, and the LED turns on. When the control is open, the circuit is broken, the buzzer stops beeping, and the LED turns off.

The objectives are to implement the "current passes through a closed circuit" principle in a Touch Me Not game using an Arduino Uno, which can be an educational and engaging project. This project aims to teach users about the basic principles of electrical circuits and how they can be used in a fun and interactive way.

1. ARDUINO UNO
2. Introduction to Arduino Uno

The Arduino UNO board is a microcontroller board that Arduino developed. Cc and is based on the Atmega328 Microcontroller.
Six analog pins and an Atmega328 microcontroller.[1] It also supports three communication protocols: Serial, I2C, and SPI [1]. Fig. 1. shows what an Arduino UNO looks like with the connecting USB port cable.
Arduino UNo has Multiple components and pins through which other devices are connected to it. Table 1 shows an overview of all the components on an Arduino UNO board.

Fig. 1. Arduino UNO. TABLE I

ARDUINO UNO FEATURES AND TECHNICAL SPECS [2]

No. Parameter Name Parameter Value

1 Microcontroller Atmega328

2 Analog I/O Pins 6 (A0 to A5)

3 PWM Pins 6 (Pin # 3, 5, 6, 9, 10 and 11)

4 Power Pins 5V, 3.3V, Vin, GND

5 Crystal Oscillator 16MHz

6 Operating Voltage 5V

7 Input Voltage 5-12V

8 Digital I/O Pins 14 (D0 to D13)

16 Environment), which is free to download from Arduino Official Site.

• It has an operating voltage of 5V, while the input voltage may vary from 7V to 12V.

• Arduino UNO has a maximum current rating of 40mA, so the load shouldn't exceed this current rating, or you may harm the board.

17 Operating frequency.

• Arduino Uno pinout consists of 14 digital pins from D0 to D13.

18 • It also has six analog pins starting from A0 to A5.

• It also has 1 Reset Pin, which is used to reset the board programmatically. To reset the board, we need to make this pin LOW.

• It also has 6 Power Pins, which provide different voltage levels.

1. How to run the code

[3]

• Download Arduino IDE from Arduino's official site

• After installing IDE, open it by double-clicking the shortcut icon or typing IDE in the Windows search bar.

• After the IDE is open, it's time to set up Arduino hardware. Now connect the Arduino board using a USB B cable through the COM port on the PC.

• Once the Arduino board is connected, it will automatically install the necessary drivers and select the port at which it is connected.

• Connection is established between the Arduino board and PC. It's time to upload an Arduino sketch. For example, we will use LED Blink code to upload it

to the Arduino board. Go to File¿Examples¿Basics¿Blink:

• Blink code will open in a new window. It's time to compile the code. Click the Verify button on the top left window corner.

• The last step is to upload this sketch in Arduino. To do this, click the right-pointing arrow known as the Upload button on the right side of the verify button. Once the upload is finished, a Done Uploading message will appear in the output window.

1. BUILDING THE HARDWARE

2. Components required

• Arduino UNO.

• Sensor shield(SST technologies) with Buzzer, RGB light.

• Jumper wires.

• 2sq,6sq-mm Wires.

1. Defining and connecting the inputs

The 6sq-mm wires are used for the start, Path, and finish points. These points are connected to different pins in the sensor shield of SSL technologies. The start point is covered with a jumper foil to connect [2] it with PIN 6. The Path is combined with another wire connected to the PIN 7. The finish point is covered with foil along with a jumper wire, which is [3] connected to PIN 8.

The 2sq-mm wire is used for the Handle, which acts as the ground that completes the circuit, letting the current pass through the circuit [4]. The Handle is connected [5] to a jumper wire connected to the ground pin in the sensor shield board.

Fig. 2. Example Picture when the Game is Started [6].

1. Fail Point

The Player, after the game has started, has to move the Handle along the track without touching the way. When the Player touches the track, the LED turns red, and a buzz is heard from the buzzer, meaning that the Player has failed to reach the finish point without touching the track and has to restart the game by going back to the start point. In this state, even when the Player reaches the final point, there is no celebration or any buzzer from the board as it is in the fail state now. To reset it, the Player has to restart the game from the start point only.

Fig. 3. Example Picture when Game is Lost.

1. Start Point

1. EXPLAINING THE GAME

1. Finish Point

The Player, after starting the game and without touching the track

The Handle is brought in contact with the start point to start the game. The Handle, when touched at the start point, the LED turns green and indicates that the Player is ready to start the game.

With the Handle, reaches the final point and touches the last issue with the Handle. The LED turns blue, red, and green with multiple buzzes, indicating that the Player has won the game.

Fig. 4. Example Picture when Game is Won.

1. Code and Output

The first section of the code defines the pins for the buzzer, Start, Final, and Fail states and initializes the default state of the game to fail. It also explains the type of the pin, whether it is an input pin or an output pin. The other remaining section of the code in the void loop changes states from Start, Fail, and Finish according to the current passed through the defined pins and changes the buzzer sounds and the LED colors according to the state.

Fig. 5. Output on three different states

When the game is in the start state, the message "NEW GAME STARTED" is displayed on the output screen with the LED on the board as green. When the state of the game changes, the corresponding state message is displayed on the output screen. When the game is in a Fail state, the"FAIL :(" message is displayed on the screen with the LED in red. So, the Player goes back and starts a new game. When the game is in Finish state, the message "***CONGRATULATIONS :)***" is displayed on the output screen with the LED toggling between blue, red, and green colors.

Fig. 6. Code used for the Arduino board

1. CONCLUSION

In conclusion, this research paper highlights the development of an interactive "Touch Me Not" game using Arduino UNO as an educational tool for teaching

closed circuit principles. The game offers an engaging and practical learning experience by combining theoretical concepts with hands-on experimentation, making it a valuable addition to STEM education. It promotes active engagement, accessibility, interdisciplinary learning, scalability across different age groups, and the demonstration of real-world applications. This innovative approach has the potential to reshape how closed-circuit principles are taught, preparing students for the digital age and fostering a lasting passion for learning in the fields of science and engineering.

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1.	*Six analog pins and an Atmega328 microcontroller.*	Incomplete sentences	Delivery
2.	~~connect~~ → associate	Word choice	Engagement
3.	*The finish point is covered with foil along with a jumper wire, which is connected to PIN 8.*	Unclear sentences	Clarity
4.	~~circuit~~ → course	Word choice	Engagement
5.	*is connected*	Passive voice misuse	Clarity
6.	*is Started*	Passive voice misuse	Clarity
7.	~~going back~~ → returning	Wordy sentences	Clarity
8.	~~point~~ → moment	Word choice	Engagement
9.	*The Handle, when touched at the start point, the LED turns green and indicates that the Player is ready to start the game.*	Unclear sentences	Clarity
10.	*is displayed*	Passive voice misuse	Clarity
11.	*" FAIL*	Improper formatting	Correctness
12.	*is displayed*	Passive voice misuse	Clarity
13.	*are taught*	Passive voice misuse	Clarity
14.	*Arduino UNO is a microcontroller board that can*	arduino projects 2021 TECHNOLOGY, IEEE PAPER, IEEE PROJECT https://www.engpaper.com/ece/arduino-projects-2021.html	Originality
15.	*When the switch is closed, the current flows through the*	Comparative study on DC-DC Converters	Originality
16.	*Environment), which is free to download from Arduino Official Site. •*	Arduino Uno | Vector Four Engineering	Originality

	It has an operating voltage of 5V, while the input voltage may vary from 7V to 12V. • Arduino UNO has a maximum current rating of 40mA, so the load shouldn't exceed this current rating, or you may harm the board.	https://vector4engineering.com/product/arduino-uno/	
17.	*Operating frequency. • Arduino Uno pinout consists of 14 digital pins*	Arduino Uno | Vector Four Engineering https://vector4engineering.com/product/arduino-uno/	Originality
18.	*analog pins starting from A0 to A5. • It also has 1 Reset Pin, which is used to reset the board programmatically. To reset the board, we need to make this pin LOW. • It also has 6 Power Pins, which provide different voltage levels.*	Arduino Uno | Vector Four Engineering https://vector4engineering.com/product/arduino-uno/	Originality
19.	*This innovative approach has the potential to reshape*	What Are Bitcoin Ordinals? A Full Guide - Asia Crypto Today https://www.asiacryptotoday.com/what-are-bitcoin-ordinals-a-full-guide/?amp	Originality
20.	*from "https://en.wikipedia.org/w/index.php?title*	Interactions of pharmaceutical companies with world countries, cancers and rare diseases from Wikipedia network analysis	Originality
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