DIGITAL ELECTRONICS INNOVATIVE ASSIGNMENT REPORT

TOPIC: FASTEST FINGER FIRST USING HARDWARE

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• INTRODUCTION

This report describes a game we created using an Arduino. It's called 'Fastest Finger First.' The game involves four contestants who compete in five rounds. Each contestant has a button, and when a question is asked, they press their button to answer. The fastest contestant to press the button gets the first chance to answer the question and the remaining in the order of their timings of pressing . As soon as the correct answer is received the point is given to the person who has given the right answer. The increment is done using their push button itself. In this report, we'll explain how we built and programmed the game and share the results of our fun and interactive project.

• KEY COMPONENTS

Arduino Microcontroller: The Arduino Integrated Development Environment (IDE) is a cutting-edge software platform designed for coding and designing projects using Arduino microcontroller boards. With its open-source nature, Arduino has become a go-to choice for a diverse community of creators, from students and hobbyists to experienced professionals, seeking to build dynamic and embedded

systems. We implemented our source code here to simulate it in the proteus software.

LCD DISPLAY : In this project, we utilized a 16x2 LCD display, a common component in electronics, to create an interactive game called 'Fastest Finger First' using an Arduino. The 16x2 display provided a simple yet effective way to show game status and announce the winner. The display's two rows, each with 16 character positions, allowed us to present information clearly, and its compatibility with the Arduino platform simplified the interface. The display was instrumental in enhancing the user experience and making the game more engaging, as contestants could see their progress and the results of each round.

• <u>PROCEDURE</u>

Step 1: Game Setup

1. Gather around the game setup, which includes an Arduino, a 16x2 LCD display, four contestant buttons (labelled for each player), and two control buttons (reset and point increment).

2. Ensure that the Arduino is powered on and ready to start the game.

Step 2: Starting a New Round

1. The LCD display will indicate that a new round is beginning.

Step 3: Question or Challenge

1. The host presents a question, challenge, or task to all the contestants. This could be a riddle, math problem, or any question that requires a quick response.

Step 4: Fastest Finger First

1. Contestants listen to the question and quickly press their respective contestant buttons as soon as they know the answer.

2. The goal is to be the "fastest finger" to press the button and provide the correct answer.

Step 5: Awarding Points

1. If a contestant believes they have the correct answer and they pressed their button first, they can press the point increment button to claim a point. The LCD will show the current round and the contestant who was awarded the point.

2. The host can verify the answer and award the point accordingly.

Step 6: Displaying Scores

1. The LCD display will continuously update to show the current round number and the scores of the contestants. The contestant with the most points will be prominently displayed.

2. The game continues with additional rounds until five rounds have been completed.

Step 7: Game Conclusion

1. After playing all five rounds, the game ends, and the LCD display may show the final scores and declare the winner.

2. The contestant with the highest score wins the game.

- # <u>CODE</u>

```cpp
#include <LiquidCrystal.h>

// Initialize LCD
LiquidCrystal lcd(8, 9, 10, 11, 12, 13);

// Define contestant buttons
const int pushbuttons[] = {2, 3, 4, 5};
const int players = 4;

// Game variables
int points[4] = {0, 0, 0, 0};
int fastestfinger[4] = {-1, -1, -1, -1};
int curr_player = 0;
int total_round = 0;

void setup()
{
  lcd.begin(16, 2);
  delay(1000);

  for (int i = 0; i < players; i++)
  {
    pinMode(pushbuttons[i], INPUT_PULLUP);
  }
}

void loop()
{
  //chaliye shuru karte hai!!
  if (total_round < 5)
  {
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Fastest Finger");
```

```
lcd.setCursor(0, 1);
lcd.print("total_round " + String(total_round + 1));
int sum = 0;
curr_player = 0;
// points[curr_player] = total_round;
while (1)
{
    delay(1);
    //store time
    if (digitalRead(curr_player + 2) == LOW &&
fastestfinger[curr_player] == -1)
    {
        fastestfinger[curr_player] = millis();
        sum++;
    }
    if (sum == 4)
    {
        break;
    }
    curr_player = (curr_player + 1) % 4;
}
print_order();
delay(500);
// lcd.clear();
lcd.setCursor(0, 0);
//choosing winner
lcd.print(String("Increment:     "));
curr_player = 0;
while (1)
{
    delay(1);
    if (digitalRead(curr_player + 2) == LOW)
    {
        points[curr_player] += 1;
        sum++;
    }
    if (sum == 5)
```

```
        {
            break;
        }
        curr_player = (curr_player + 1) % 4;
    }
    total_round++;
    resetGame();
    delay(500);
}
else
{
    lcd.clear();
    lcd.setCursor(0, 0);
    //printing player points and declaring final winner
    lcd.print("GameOver!points: ");
    lcd.setCursor(0, 1);
    for (int i = 0; i < 4; i++)
    {
        lcd.print(String(i + 1) + String(":") + String(points[i]) + String(" "));
    }
    delay(3000);
    int maxi = 0, maxp = points[0];
    for (int i = 1; i < players; i++)
    {
        if (maxp < points[i])
        {
            maxi = i;
            maxp = points[i];
        }
    }
    lcd.clear();
    lcd.setCursor(0, 0);
    // apko milte hai 7 crore!!!
    lcd.print(String("Winner!!! ") + String(maxi + 1));
    lcd.setCursor(0, 1);
    lcd.print(String("points: ") + String(maxp));
    for (int i = 0; i < players; i++)
```

```
      {
         points[i] = 0;
      }
      delay(5000);
      lcd.clear();
      total_round = 0;
   }
}


void print_order()
{
   int sorted_order[4][2];
   for (int i = 0; i < 4; i++)
   {
      sorted_order[i][0] = i + 1;
      sorted_order[i][1] = fastestfinger[i];
   }
   // Algorithm for sorting on the basis of 2nd column(time)
   for (int i = 0; i < players - 1; i++)
   {
      for (int j = i + 1; j < players; j++)
      {
         if (sorted_order[i][1] > sorted_order[j][1])
         {
            int temp0 = sorted_order[i][0], temp1 = sorted_order[i][1];
            sorted_order[i][0] = sorted_order[j][0];
            sorted_order[i][1] = sorted_order[j][1];
            sorted_order[j][0] = temp0;
            sorted_order[j][1] = temp1;
         }
      }
   }
   lcd.clear();
   lcd.setCursor(0, 0);
   lcd.print("Winner list: ");
   lcd.setCursor(0, 1);
   for (int i = 0; i < 4; i++)
```
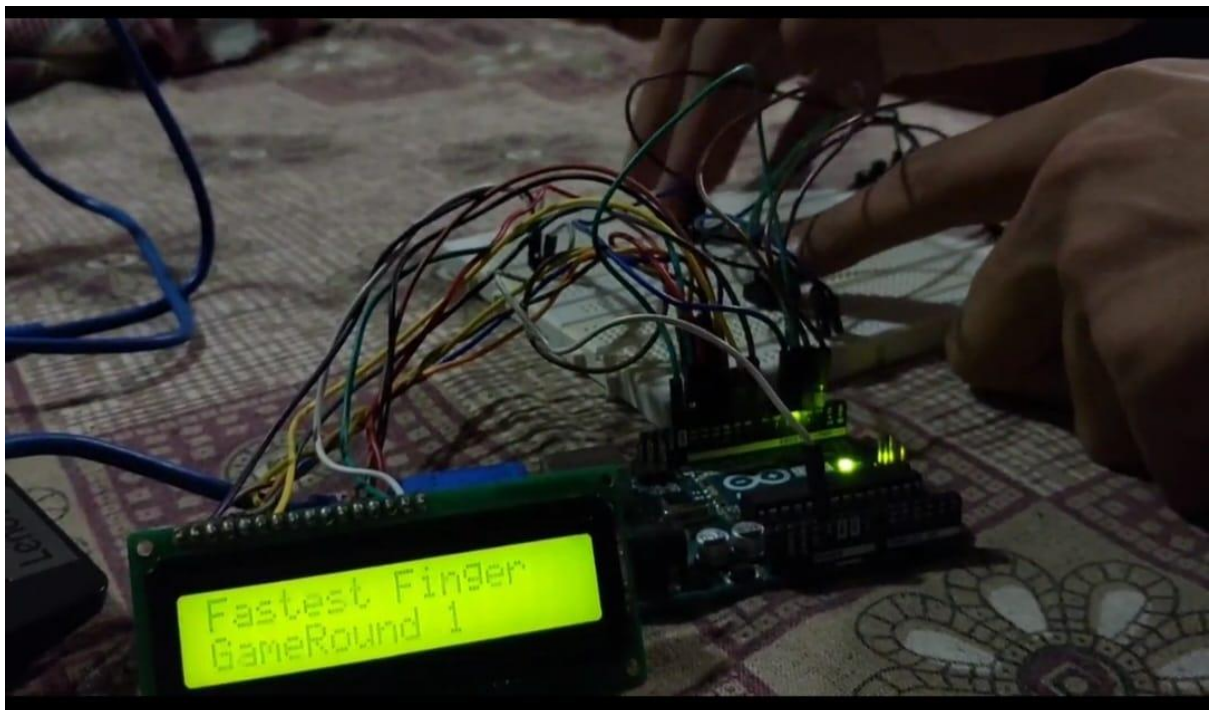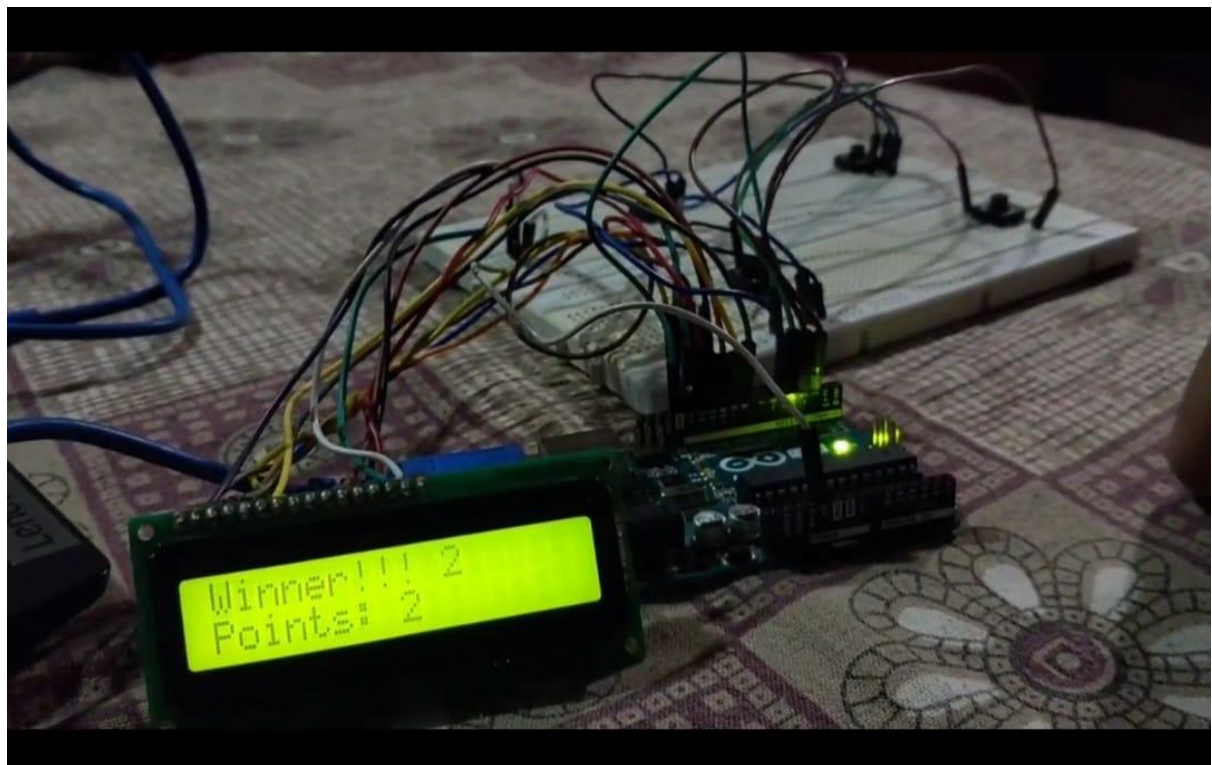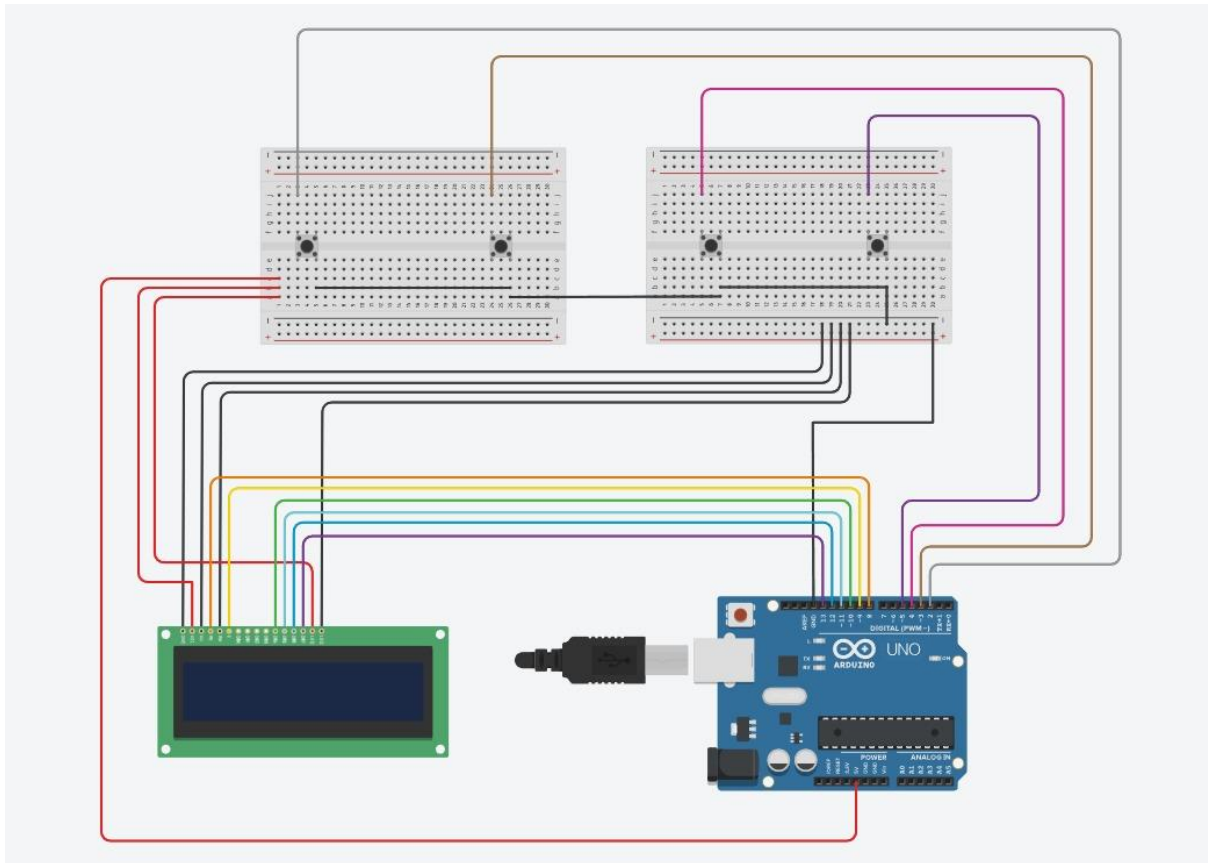
```
    {
        lcd.print(String(sorted_order[i][0]) + String(" "));
    }
}

void resetGame()
{
    //game firse shuru
    for (int i = 0; i < players; i++)
    {
        fastestfinger[i] = -1;
    }

    lcd.clear();
}
```

Here are some glimpses of the innovative assignment prepared by us. You may watch it keenly.

Here is the circuit design of our innovative assignment which includes a 16*2 display, Arduino microcontroller , 4 push buttons and many jumper wires of different kinds . This works with a code written by us in c language of Arduino.

• <u>Conclusion</u>

In conclusion, our project to create the 'Fastest Finger First' game using an Arduino and a 16x2 LCD display was a fun and successful experience. We used buttons for players to answer questions quickly, and the display showed the scores and progress. We learned a lot about how electronics and coding work while making this game. It's a great way to have fun with friends or host competitions. In the future, we could make it even more exciting by adding more features and questions. Overall, our project was a fantastic learning and gaming adventure!