

PROFESSIONAL TRAINING REPORT
at
Sathyabama Institute of Science and
Technology (Deemed to be University)

Submitted in partial fulfillment of the requirements for the award
of Bachelor of Technology Degree in
Information Technology
By

NAME:POOJA BALAKIRSHNAN
(Reg. No.38120058)



DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING

SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
Accredited with Grade "A" by NAAC
JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

JANUARY 2021



SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY

(Established under Section 3 of UGC Act, 1956)
Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai -
600119 www.sathyabama.ac.in



SCHOOL OF COMPUTING

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **POOJA BALAKRISHNAN** (Reg.no.**38120058**) who carried out the project entitled “**FLAPPY BIRD GAME USING ARDUINO**”under our supervision from Jan 2019 to April 2019.

Internal Guide

Name and Signature,

Dr . A . Sivasangari ME , PHD , Associate professor...

Head of the Department

Name and Signature

Dr.SUBHASHINI M.E., Ph.D. ,

Submitted for Viva voce Examination held on _____

Internal Examiner

External Examiner

DECLARATION

I **POOJA BALAKRISHNAN** hereby declare that the Project Report entitled “**FLAPPY BIRD GAME USING ARDUINO**” done by me under the guidance of **Dr . A . Sivasangari ME , PHD , Associate professor..**, and **Dr.SUBHASHINI M.E., Ph.D. ,** at **SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering / Technology degree in **INFORMATION TECHNOLOGY**

DATE:

PLACE:

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T.Sasikala M.E., Ph.D**, Dean, School of Computing **Dr.SUBHASHINI M.E., Ph.D.** , Head of the Department of Information and Technology for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr . A . Sivasangari ME , PHD , Associate professor..**, for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Information Technology** who were helpful in many ways for the completion of the project.

INDEX

- I. ABSTRACT**
- II. INTRODUCTION**
- III. RELATED WORK**
- IV. BLOCK DIAGRAM/ARCHITECTURE**
- V. SYSTEM DESIGN**
- VI. IMPLEMENTATION AND RESULTS**
- VII. IMPLEMENTATION CODE**
- VIII. APPLICATIONS**
- IX. CONCLUSION**

ABSTRACT:

- ✓ The main concept of the Flappy Bird Game using Arduino is very simple.
- ✓ The aim of the game is to successfully pass the “bird” through these “obstacles” simply by pushing the button.
- ✓ The game is created in Processing and the Arduino communicates with it using the serial port.

INTRODUCTION:

- Flappy Bird was a side scrolling game developed by Dong Nguyen
- Even though the game is based on 2D Graphics, it became quite popular on both Android and iOS platforms.
- The aim of the game is simple, try to fly the bird, which is called “FABY”, between the green pipes without hitting them.
- Due to its addictive nature, the developer of the game discontinued the game from both the channels (Google Play Store and App Store) but a revised version for Amazon Fire TV is launched on

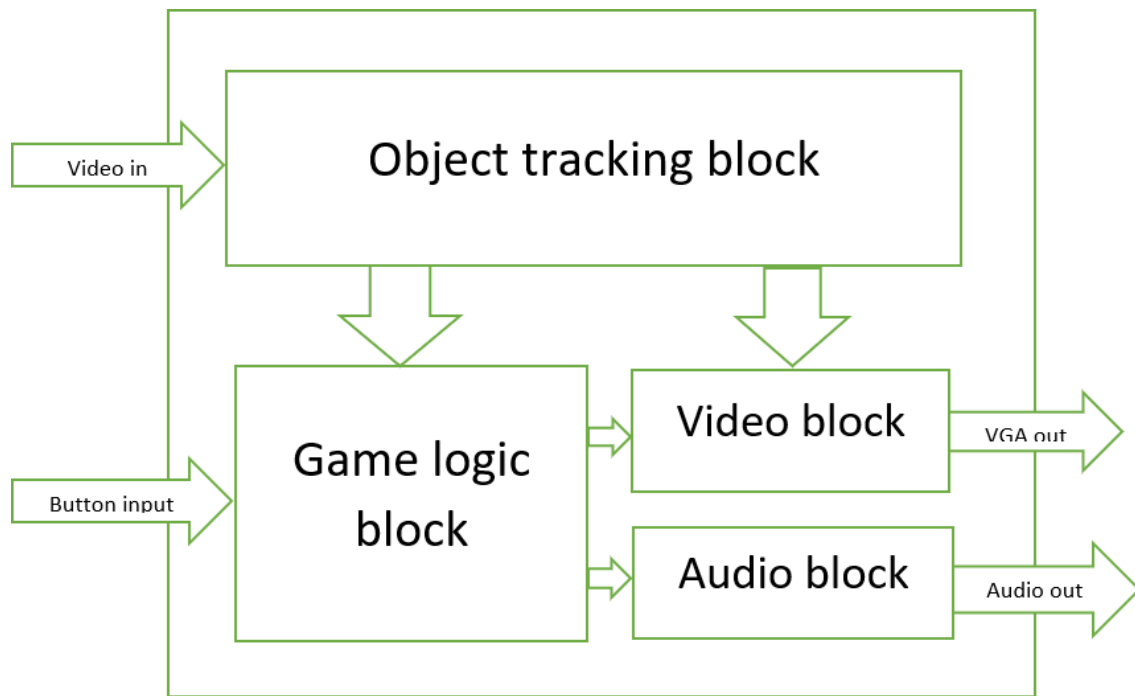
- Amazon App Store.
- The popularity of the lead to many replica games and cloned versions were released.
- In this project, I will take the concept of the game and implement a DIY type Flappy Bird Game using Arduino.
- Since Arduino is a simple microcontroller platform, I don't want to invest heavily into the project and implement the Flappy Bird Game using Arduino, 16×2 LCD Display and a Push Button.

RELATED WORK:

In flappy bird game, the prototypes can be easily implemented by exploiting new open source electronics, such as arduino and related sensors, combining simplicity, wide diffusion and low cost.

The experience shows that several alternative configurations are easily implemented, calling for the possibility of developing a hardware/software component library for development/assembly of various types of games also by non -experts.

BLOCK DIAGRAM:



DESCRIPTION:

1. Flappy Bird is a 2D game with simplicity in mind. Hence the primary objective was to develop a game that was a breeze to use for the end user.
2. The push button interfaced with board acts as an interface between the user and device which enables the control of the movement of the bird and helps it maneuver and skip the incoming obstacles.
3. The bird continues to gradually descend
4. reach the bottom of the screen unless an input from the user helps it to fly upwards.
5. The signals received from the buttons are relayed to the microcontroller from the general purpose I/O pins.
6. The game is especially challenging when the user has take care of not letting the bird escape the screen space as well as dodging as many obstacles as possible in order to beat the high score.
7. However, if the either of challenges are not tackled, the game finishes and displays the current score.

IMPLEMENTATAION AND RESULTS:

- Arduino UNO
- 16×2 LCD Display
- Push Button
- Connecting Wires
- Breadboard
- 5V Power Supply

- After making all the connections as per the circuit diagram, upload the code to Arduino and power on the circuit. The moment you turn on the power supply, the game begins by displaying “START GAME” on the LCD.
- Once the game starts, the Flappy Bird can be toggled its position using the interrupts pin with the help of the push button. If the bird is in the top, by pressing the button, you can move it to down and vice – versa.
- If the bird touches any of the obstacles, you will lose and the game is over. Since this is a simple version of the game, there are only a few obstacles and if you successfully overcome all those obstacles, you will win the game.

IMPLEMENTATION CODE:

```
◦ #include<LiquidCrystal.h>
◦ LiquidCrystal lcd (8,7,6,5,4,3); //RS, E, D4, D5, D6, D7
◦ int ledPin = 13;
◦ int buttonPin = 2;
◦ int ledToggle;
◦ int previousState = HIGH;
◦ unsigned int previousPress;
◦ volatile int buttonFlag;
◦ int buttonDebounce = 20;
◦ int i=0;
◦ int pos=0;
◦ int Speed=100;
◦ String typea      = "          ##          #####
  ##      #####      #####      #####          ##
  ";
◦ String typeaa     = "          ##          #####
  ##      #####      ##          ##          ##
  ";
◦ int  typeA[]      =
  {22,23,32,33,34,35,36,37,43,44,52,53,54,55,61,62,63,64,72,73,74,75,
  76,77,78,79,87,88};//28
◦ int typeAA[]      =
  {17,18,26,27,28,29,40,41,47,48,49,50,58,59,69,70,82,83};//18
◦ void setup()
◦ {
◦   lcd.begin(16,2);
◦   lcd.begin(16,2);
◦   pinMode(ledPin, OUTPUT);
◦   pinMode(buttonPin, INPUT_PULLUP);
◦   attachInterrupt(digitalPinToInterrupt(2), button_ISR, CHANGE);
◦   while(ledToggle==0)
◦   {
◦     lcd.clear();
◦     delay(500);
◦     lcd.print("      START GAME  ");
◦     delay(500);
◦   }
◦   lcd.clear();
◦   lcd.setCursor(0,0);
◦   lcd.print('O');
```

```

    ◦ //lcd.print(bala.substring(1,3));
    ◦
    ◦ }
    ◦ void loop()
    ◦ {
    ◦
    ◦ while(1)
    ◦ {
    ◦     for(i=0;i<89;i++)//
    ◦     {
    ◦         if(pos==0)
    ◦         {
    ◦             lcd.setCursor(1,0);
    ◦             lcd.print(typea.substring(i+1,16+i));
    ◦         }
    ◦         else
    ◦         {
    ◦             lcd.setCursor(0,0);
    ◦             lcd.print(typea.substring(i,16+i));
    ◦         }
    ◦     }
    ◦ if(pos==1)
    ◦     {
    ◦         lcd.setCursor(1,1);
    ◦         lcd.print(typeaa.substring(i+1,16+i));
    ◦     }
    ◦     else
    ◦     {
    ◦         lcd.setCursor(0,1);
    ◦         lcd.print(typeaa.substring(i,16+i));
    ◦     }
    ◦
    ◦
    ◦
    ◦
    ◦ for(int j=0;j<28;j++)
    ◦ {
    ◦     if(typeA[j]==i)
    ◦     {
    ◦         if(pos==0)
    ◦         {
    ◦             gameover();
    ◦         }
    ◦     }
    ◦ }

```

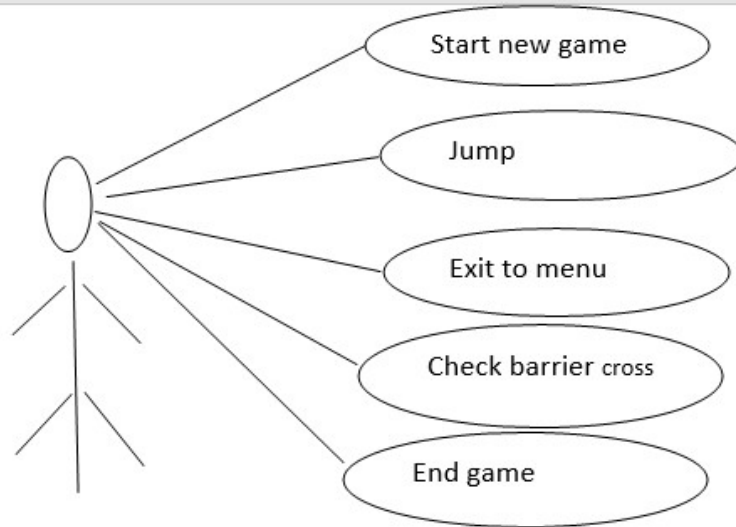
```

    }
    for(int j=0;j<18;j++)
    {
        if(typeAA[j]==i)
        {
            if(pos==1)
            {
                gameover();
            }
        }
    }
}
delay(Speed);
}
winner();
}
}
void gameover (void)
{
    detachInterrupt(digitalPinToInterrupt(2));
    while(1)
    {
        lcd.clear();
        delay(500);
        lcd.print("      GAME OVER      ");
        delay(500);
    }
}
void winner (void)
{
    detachInterrupt(digitalPinToInterrupt(2));
    while(1)
    {
        lcd.clear();
        delay(500);
        lcd.print(" WINNER! WINNER!");
        lcd.setCursor(0,1);
        lcd.print(" CHICKEN DINNER ");
        delay(500);
    }
}
void button_ISR()
{

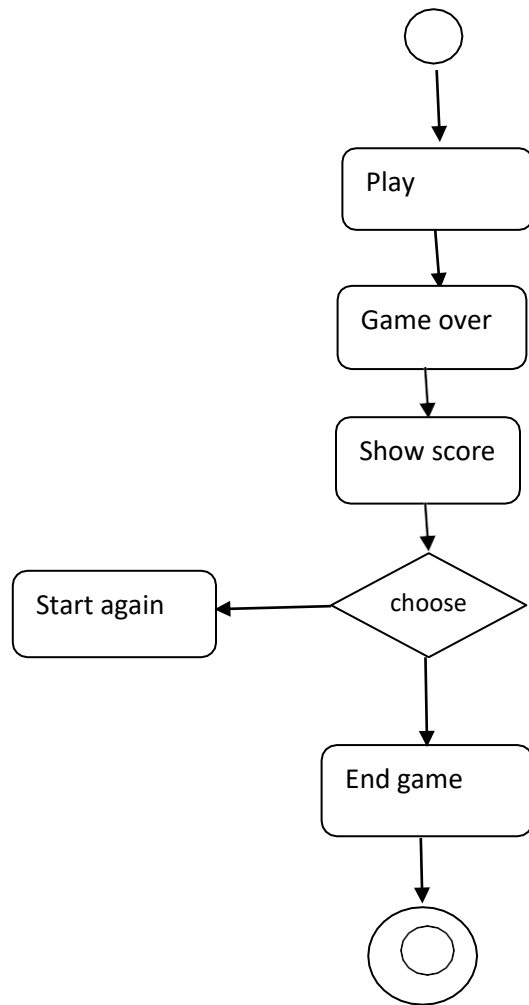
```

- buttonFlag = 1;
- if((millis() - previousPress) > buttonDebounce && buttonFlag)
- {
- previousPress = millis();
- if(digitalRead(buttonPin) == LOW && previousState ==
- HIGH)
- {
- ledToggle = ! ledToggle;
- digitalWrite(ledPin, ledToggle);
- previousState = LOW;
- if(ledToggle)
- {
- lcd.setCursor(0,0);
- lcd.print('O');
- lcd.setCursor(0,1);
- lcd.print(' ');
- pos=0;
- }
- else
- {
- lcd.setCursor(0,1);
- lcd.print('O');
- lcd.setCursor(0,0);
- lcd.print(' ');
- pos=1;
- }
- }
- else if(digitalRead(buttonPin) == HIGH && previousState == LOW)
- {
- previousState = HIGH;
- }
- buttonFlag = 0;
- }
- }
- }

System design: USE CASE:



Activity diagram:



APPLICATIONS:

- In developing game projects based on code-based control.
- It is a low cost implementing project and so it is used in the gaming industries.
- In virtual reality, arduino based games applications are implemented.
- The gaming industries which are using arduino based game applications are Microsoft (Xbox), Sony (Playstation) and Nintendo, with Google acting as a new competitor with their cloud-based gaming platform, Stadia.

CONCLUSION:

- A simple DIY style project where I have created a Flappy Bird Game using Arduino, 16×2 LCD Display and a push button.
- Implementing this game in hardware was an enjoyable project.
- My goals were achievable, and I accomplished what I wanted.
- Overall, this project helped me experience working with hardware implementation and interfacing with outside world.

REFERENCES:

<https://www.electronicshub.org/flappy-bird-game-using-arduino>

<https://howtomechatronics.com/projects/arduino-game-project-replica-of-flappy-bird-for-arduino-on-a-tft-touch-screen/>

