

CS6105 – DIGITAL FUNDAMENTALS AND COMPUTER ORGANIZATION

Mini Project - Final Report

ARDUINO LCD GAME

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ABSTRACT

This jumping jack game is a basic game which uses a single button for its controls. This game can be used to build many higher-level games.

It is a side scrolling jumping game. In this game the player has to steer clear of the obstacles to earn points until an obstacle is hit by using the single button. The button is used to perform operations like starting the game, jumping and restarting the game. The points scored will be displayed on the lcd itself. It is an infinite game in which the obstacles are generated and moved from left to right. The game will be over if the player collides with any of the obstacles

INTRODUCTION (SCOPE OF THE WORK AND ITS IMPORTANCE)

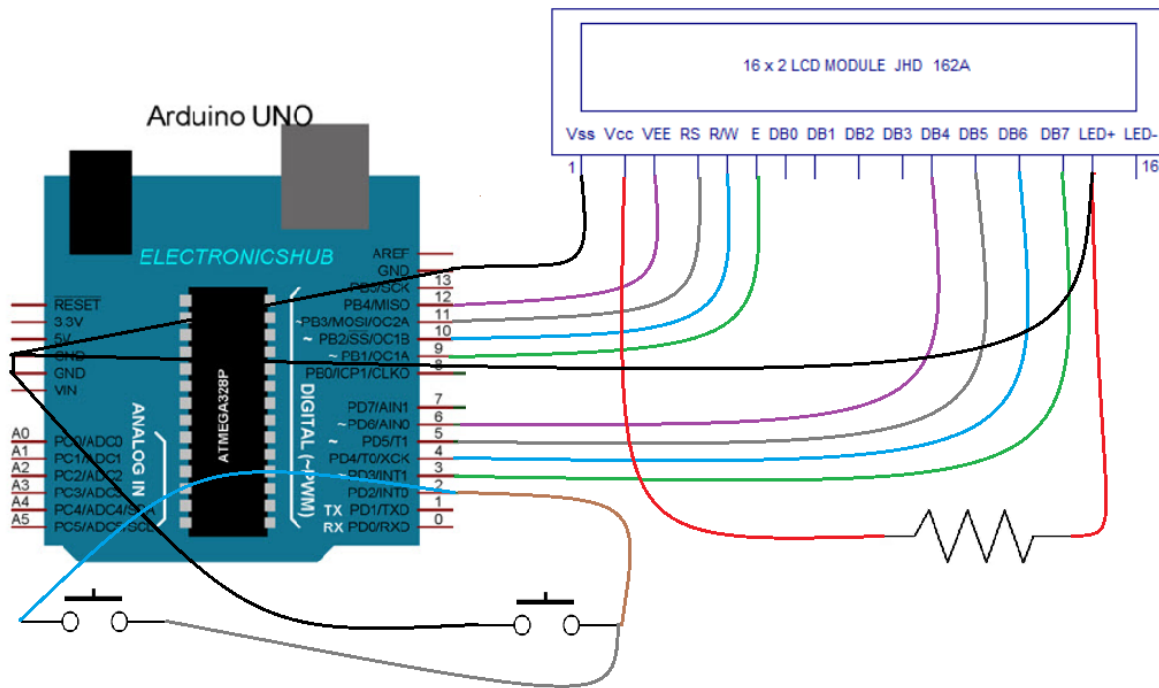
The gaming industry has undergone a substantial evolution since the 1970s and has moved from a fringe activity into the mainstream. The gaming industry is no longer a niche arena for a certain age group or consumer segment. With the advent of mobile gaming and improvements to hardware used in playing these games, gaming has become a viable form of entertainment for players from all backgrounds and ages.

In this project we have created a simple jumping jack game using an arduino board and an LCD display. This is a replication of the popular classic Mario game. This game is a basic game which is a good starting point for making higher level games. This serves as a good kick off for creating your own games from simple maker electronics.

It is analogous to the offline T-REX game in google chrome. This game is cost effective as well as simple to construct with minimal number of components

DESIGN/IMPLEMENTATION

➤ CIRCUIT DIAGRAM DRAWN USING MICROSOFT PAINT TOOL



➤ COMPONENTS USED

HARDWARE COMPONENTS:

- Arduino Uno
- LCD (16x2)
- Push Button
- Resistor 220 ohms
- Wires
- Power supply

SOFTWARE COMPONENT:

- Online Simulator- Tinker Cad

➤ CONNECTIONS

The LCD (Liquid Crystal Display) module has a 16-pin male header on the underside
All of the electronic signals that power and control the LCD go through this header.

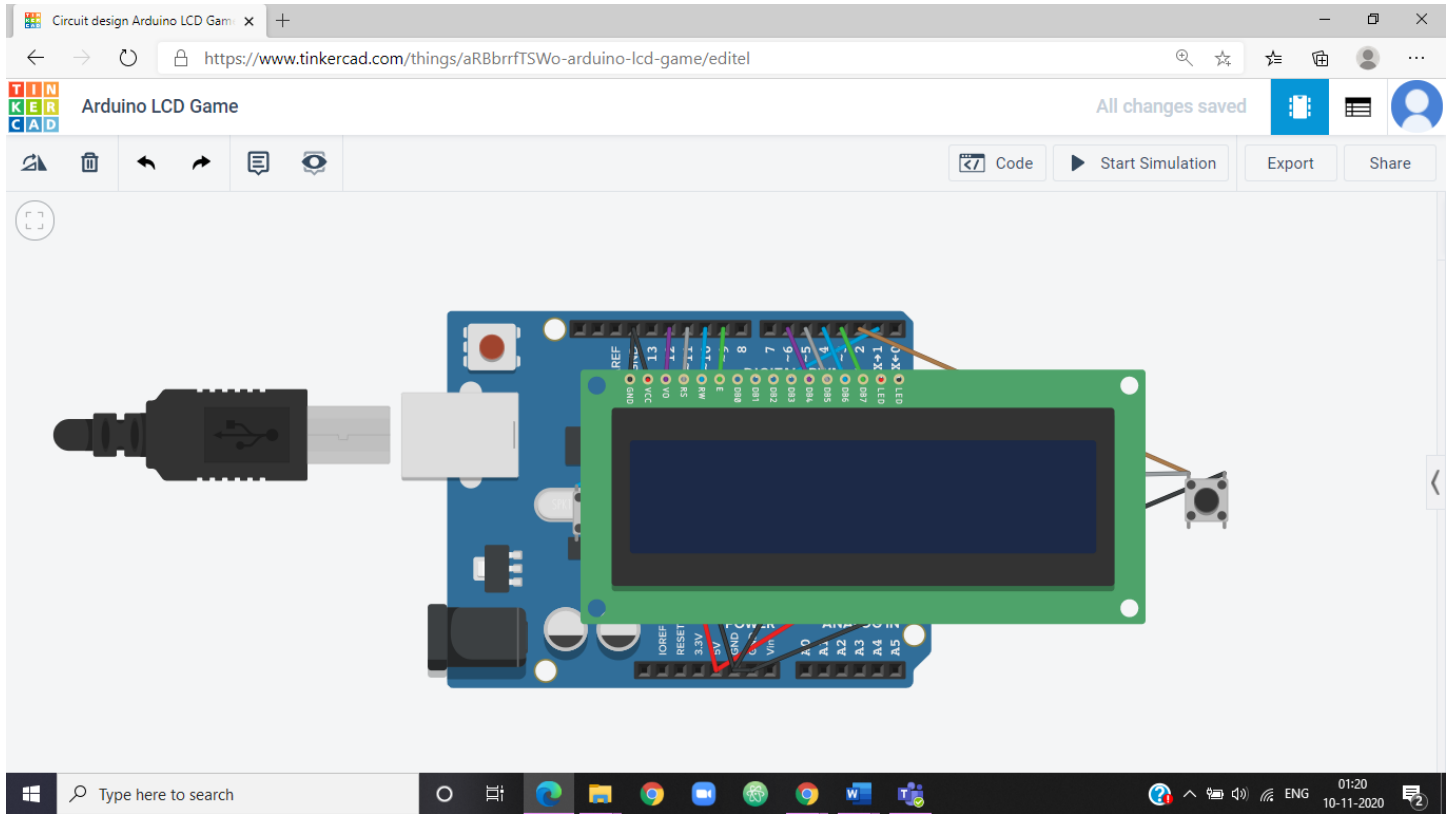
These pins are (from left to right):

- GND - power ground signal
- VCC - positive power signal
- V0 - contrast adjust
- RS - register select
- R/W - read/write select
- E - operation enable signal
- DB0 - data bit 0 (not used here)
- DB1 - data bit 1 (not used here)
- DB2 - data bit 2 (not used here)
- DB3 - data bit 3 (not used here)
- DB4 - data bit 4
- DB5 - data bit 5
- DB6 - data bit 6
- DB7 - data bit 7
- LED+ - backlight LED positive
- LED- - backlight LED negative

- Using short hookup wires, GND and LED- (pins 1 and 16) are connected to the black row at the top.
- Similarly, VCC (pin 2) is connected to the red row at the top with a short hookup wire.
- The wire leads of the 220 Ω resistor (red-red-brown colored bands) are bent and connected between LED+ and the red row at the top of the breadboard.
- Longer hookup wires are used to make the remainder of the connections:
- DB7 is connected to Arduino pin 3
- DB6 is connected to Arduino pin 4
- DB5 is connected to Arduino pin 5
- DB4 is connected to Arduino pin 6
- E is connected to Arduino pin 9
- R/W is connected to Arduino pin 10 (or to black row at top of breadboard)
- RS is connected to Arduino pin 11
- V0 is connected to Arduino pin 12 (or to black row at top of breadboard)
- The pushbutton is plugged to the left of the LCD screen, straddling the channel running along the center of the breadboard . One of the top two pins of the button is connected to the black row at the top of the breadboard using a short hookup wire. The other pin is connected at the top of the button to pin 2 of the Arduin

TESTING/RESULT AND ANALYSIS

Circuit before starting the simulation:

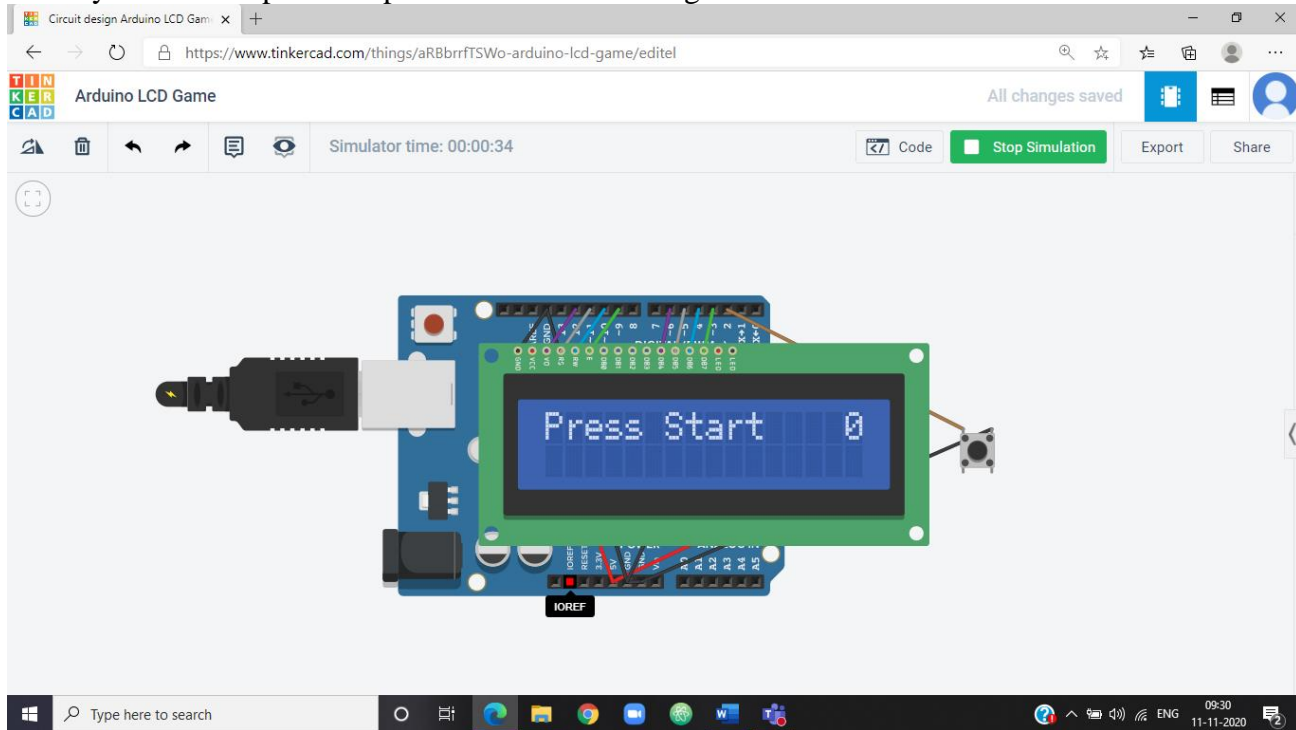


WORKING

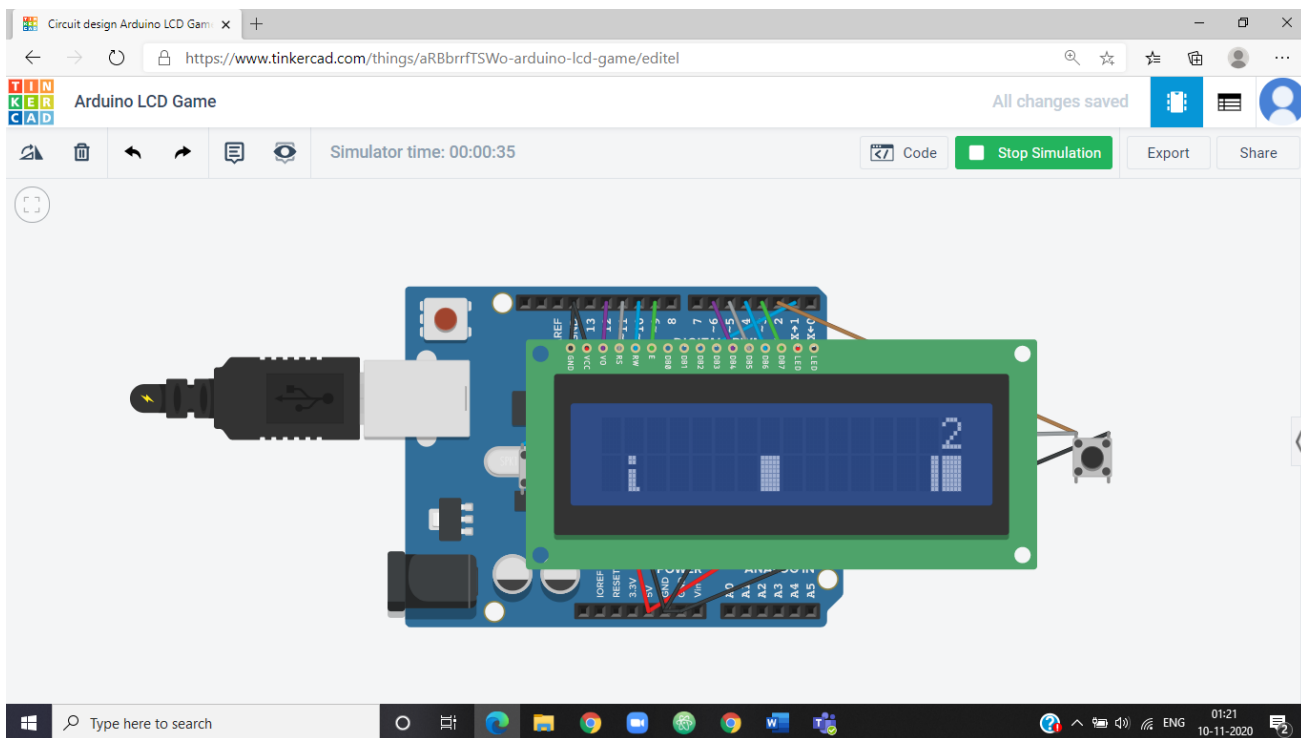
The connections are made according to the circuit diagram. This whole game is controlled by a single button. The function of the button is to convey a signal to the arduino. Once the arduino receives a signal, the character jumps according to the programmed script. This is an endless runner game in which a character continuously moves forward.

The circuit after starting the simulation:

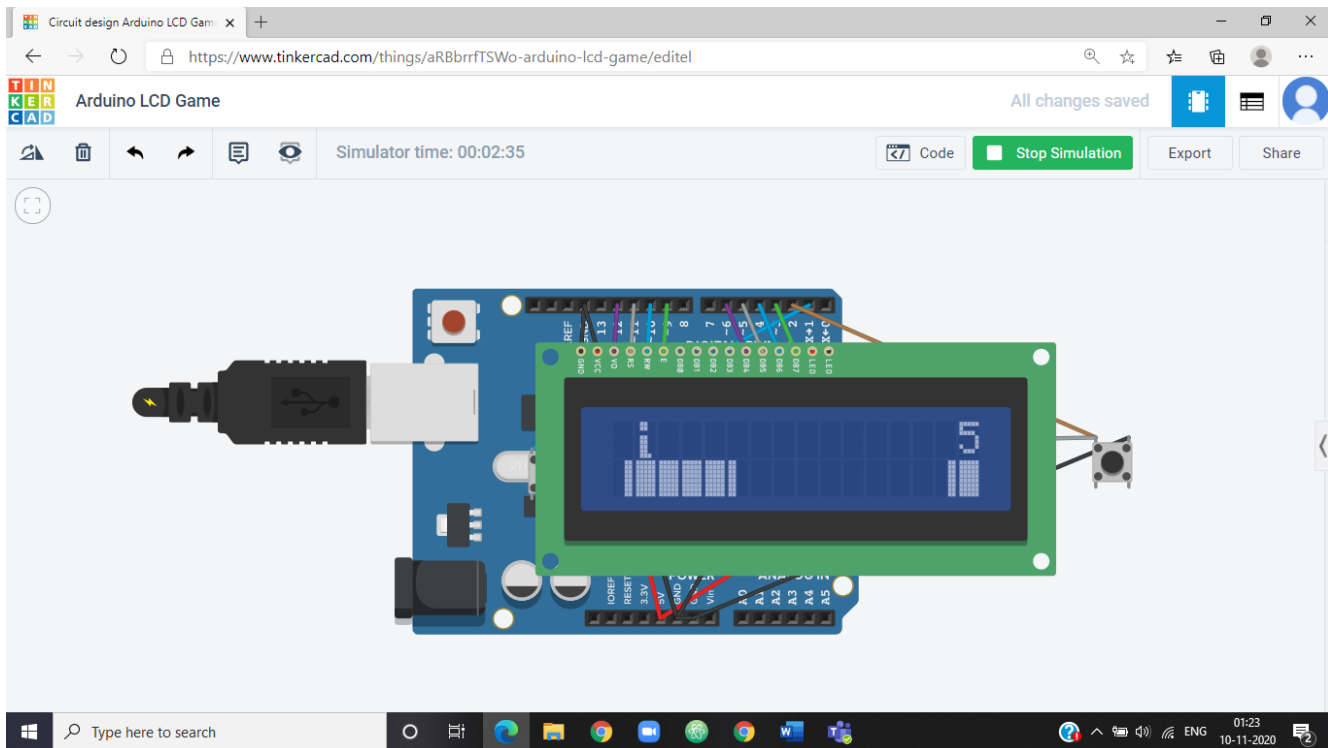
Initially we need to press the push button to start the game.



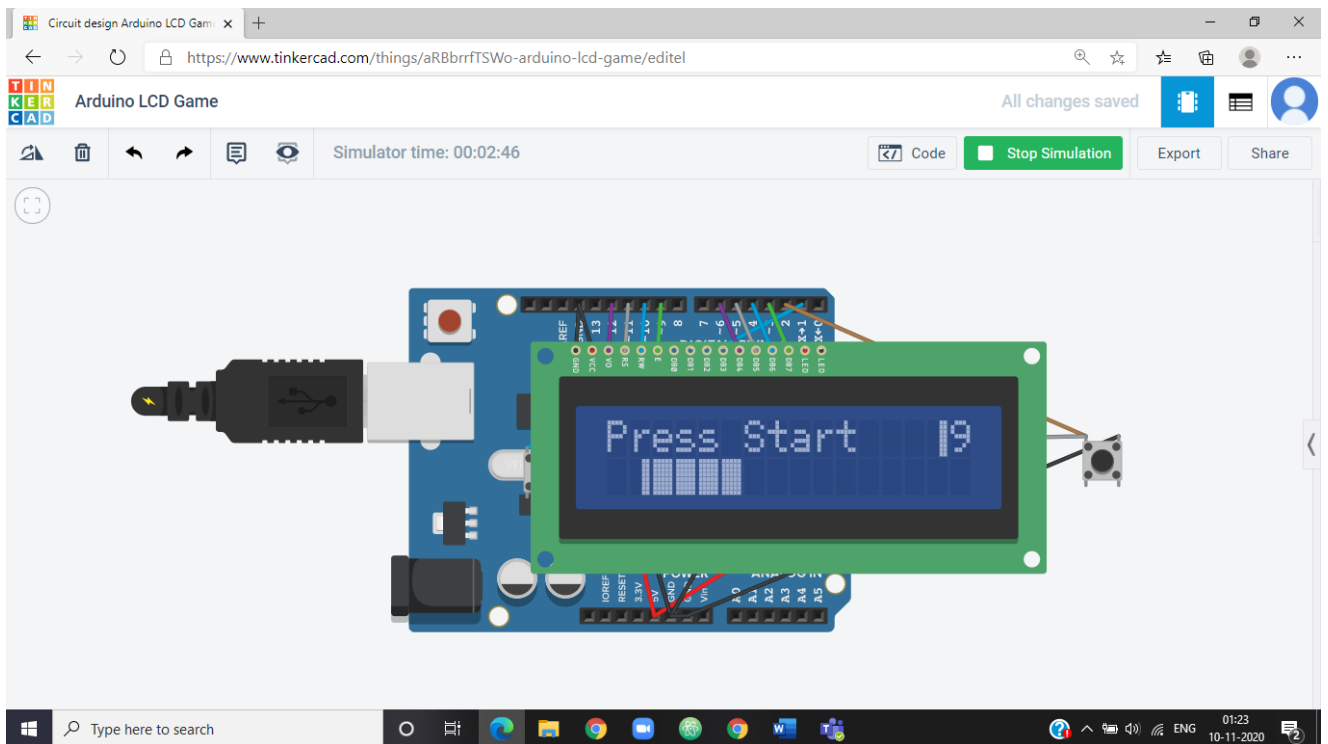
Random obstacles are generated continuously. And the character keeps moving forward.



Whenever the character encounters an obstacle, the push button needs to be pressed to jump. The score is displayed throughout the whole game.



The game ends when the character hits an obstacle and the final score is displayed.



CONCLUSION

Game developers across emerging economies are continually striving to enhance gamer's experience, launching, and rewriting codes for diverse console/platforms, such as PlayStation, Xbox, and Windows PC, which are incorporated into one product provided to the gamers through the cloud platform.

Evidence of the increasing player willingness to play video games across a variety of media and different platforms can be seen in the rise of casual gaming on smart phones, tablets, and social networking sites as 92% of all smart phone and tablet owners play games at least once a week, 45% play daily. Thus the gaming industry is blooming with newer opportunities and technologies.

In this sense we have developed a prototype which was a starting point in the evolution of gaming industry.

REFERENCES

<https://www.hackster.io/joshua-brooks/arduino-lcd-game-5e07dd#overview>

- ❖ This site is used to get the basic idea of assembling the circuit

https://www.youtube.com/watch?v=LVPSwgAacac&feature=emb_logo

- ❖ This video helped to understand how to play this game.

<https://www.tutorialspoint.com/arduino/index.htm>

- ❖ This link is used to know all about arduinos

<https://create.arduino.cc/projecthub/muhamd-magdy/arduino-game-by-lcd-9a3bc2>

- ❖ This site is used to learn about components and connections

<https://www.youtube.com/watch?v=dZZynJLmTn8>

- ❖ This video provides all the details about the project including assembling procedures, connections and coding part of the game.