

East West University
Department of Electrical and Electronics Engineering
EEE 302

Project name : LCD gaming using a joystick

Sec : 01

Group members : Tawfik Aziz Rahman

Kawsar Zaman Anik

Md. Ishtiaque Hasan

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Submitted to : Mashuque Alamgir

Project objective

The main purpose of this project is to build a microcontroller based game for a 6 year old child. Arduino is used here as the microcontroller where Atmega328 is the controller. Familiarizing with Arduino platform is also a minor objective of this project. This game will be designed as microprocessor based android game. With the help of this game a child will be able to response quickly according to the stage to the game. In this game a character needs to survive from different obstacles, if not then the game will end. Gamer needs to survive the character to continue the game.

Required Hardware components:

1. Arduino Uno
2. LCD display
3. Breadboard
4. Wires
5. Joystick module
6. Potentiometer (10K)
7. +5V battery

Description of the Hardware Components

1. Arduino Uno (Microcontroller):

The Arduino Uno is a small, complete, and breadboard-friendly board based on the ATmega328P released in 2010. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The board can be powered through a type-B mini-USB cable or from a 5 V battery.

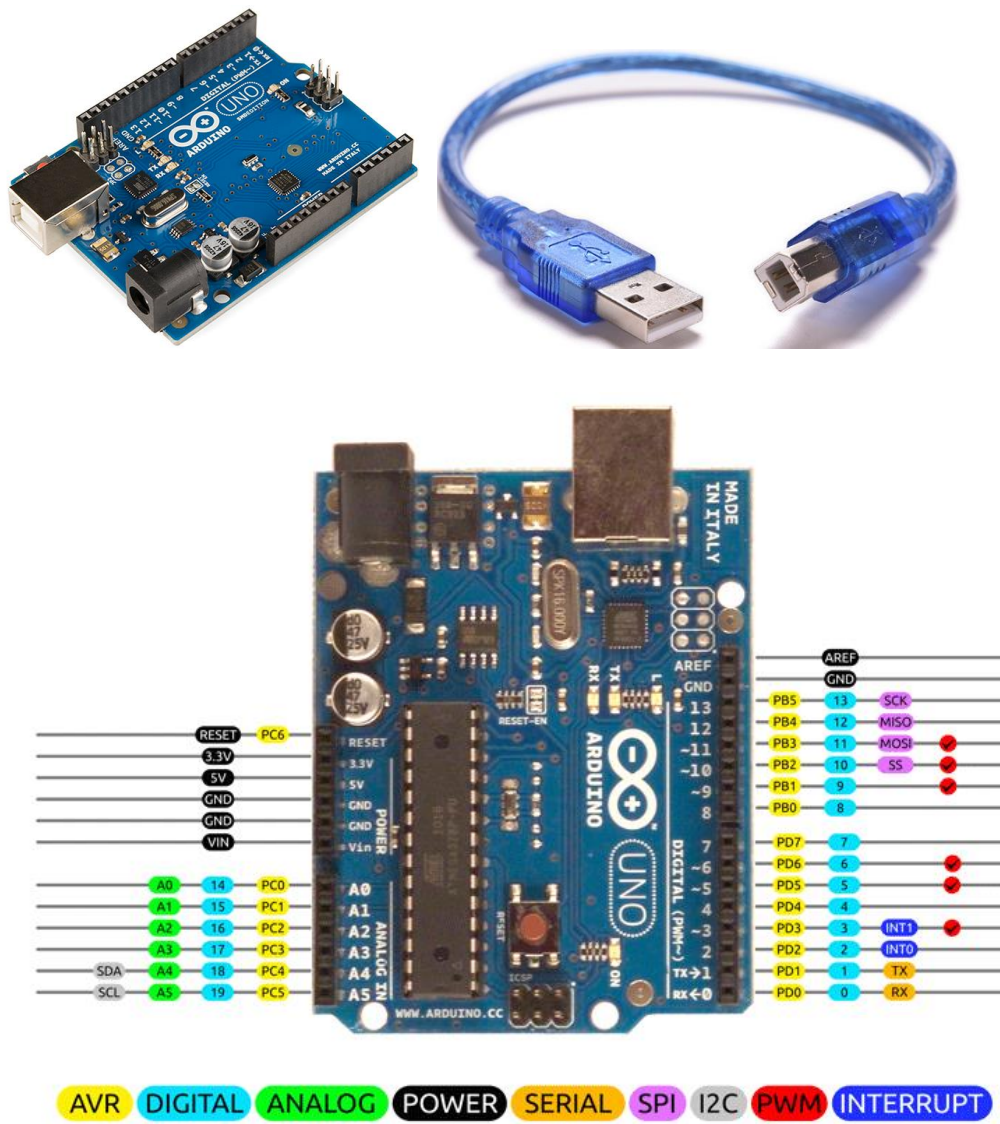


Fig 1: Arduino Uno with cable with its pin diagram

2. LCD display Green:

The operating voltage of this LCD is 4.7V-5.3V. It includes two rows where each row can produce 16 characters. The utilization of current is 1mA with no backlight. Every charter can be built with a 5×8 pixel box. This display can work on two modes like 4-bit and 8-bit. These are obtainable on blue and green backlight. Here in our project, we use the display that has green backlight.



Fig 2: LCD display.

3. Breadboard:

A breadboard is used for building temporary circuits. It is useful to students because it allows components to be removed and replaced easily when required. It is useful in our project because here we build a circuit to demonstrate its action.

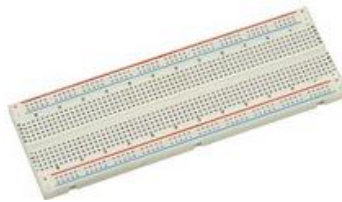


Fig 2: Breadboard.

4. Wire:

Wire is used to conduct electricity and provide a low resistance path for electricity to flow through. Here in our project we used small wires for our advantages.



Fig 4: Wires.

4. Joystick module:

The Joystick module is similar to analog joysticks found in gamepads. It is made by mounting two potentiometers at a 90 degrees angle. The potentiometers are connected to a short stick centered by springs. This module produces an output of around 2.5V from X and Y when it is in resting. In our project we used just the X pin.



Fig 5: Joystick module.

5. Potentiometer (10K):

A 10k potentiometer is an electronic component that can be used to control the flow of electricity through a circuit, much like a faucet regulates the flow of water in home. In our project we used this potentiometer to adjust the brightness of our display.



Fig 6: Joystick module.

6. +5V battery:

In our circuit we needed a +5V power supply. Instate of buying a battery we use and old smartphones charges that can supply +5v as required and use that as a power supply.

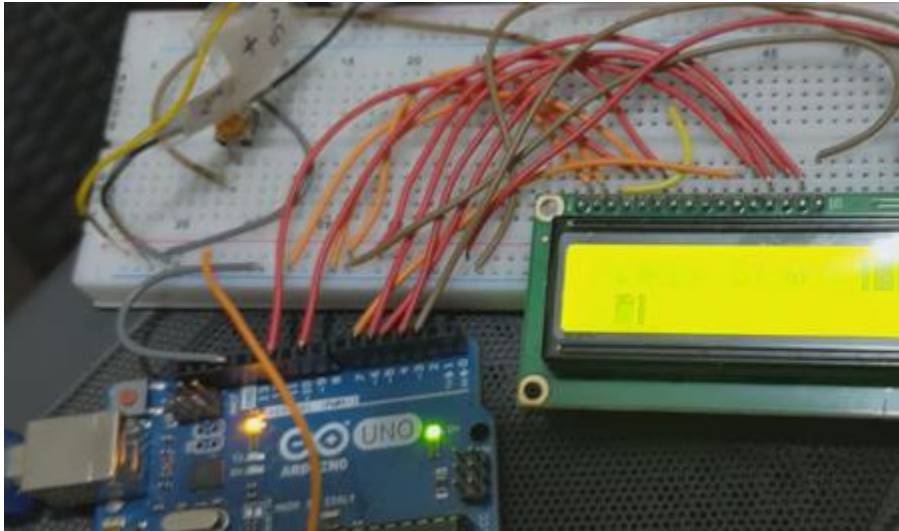


Fig 7: +5V power supply.

Design Procedure:

Step 1:

First we connect the power supply in the breadboard and made the switch of the power supply off. Than we built the following circuit carefully.



Step 2:

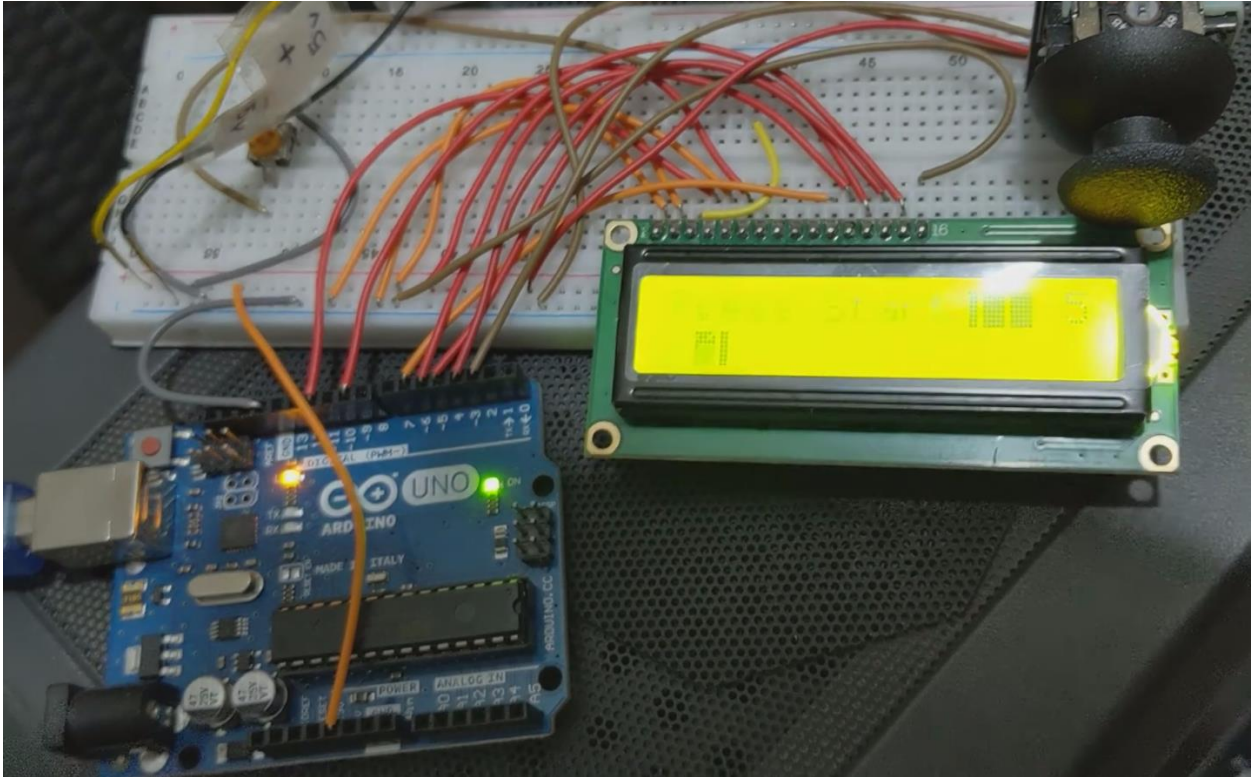
We implement our potentiometer in the breadboard carefully so that the required wires could reach there easily.

Step 3:

Then we connect the joystick carefully so that no pins get damage. Here one major thing was in our game

Step 4:

Now we turn on the switch of the power supply.



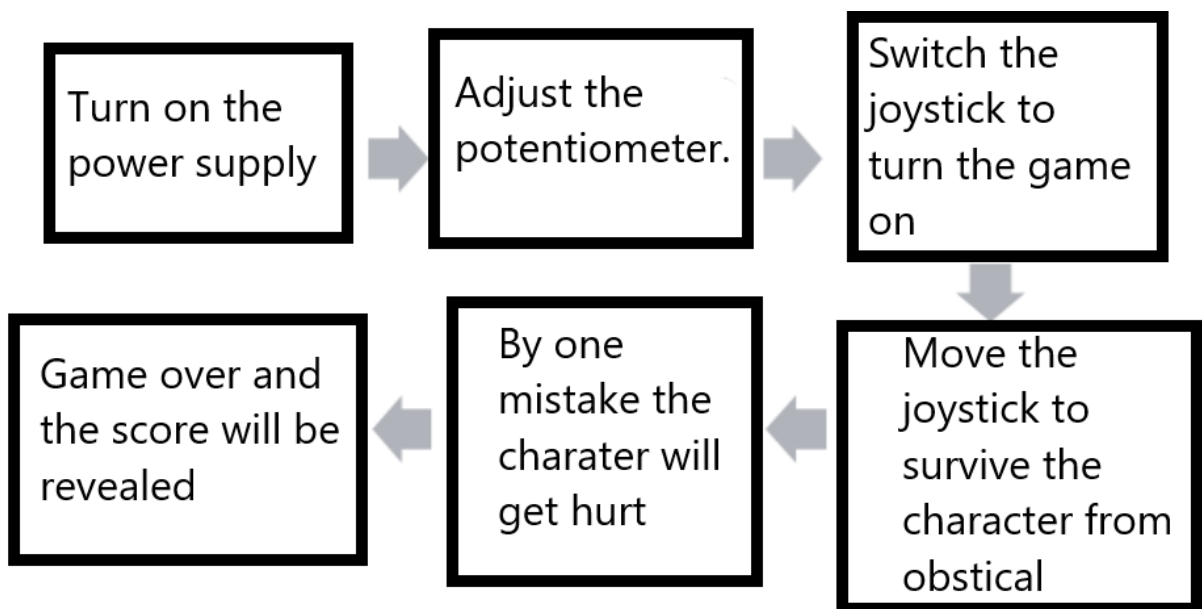
Step 5:

Finally we adjust the potentiometer so that the output can be shown by the display comfortably.

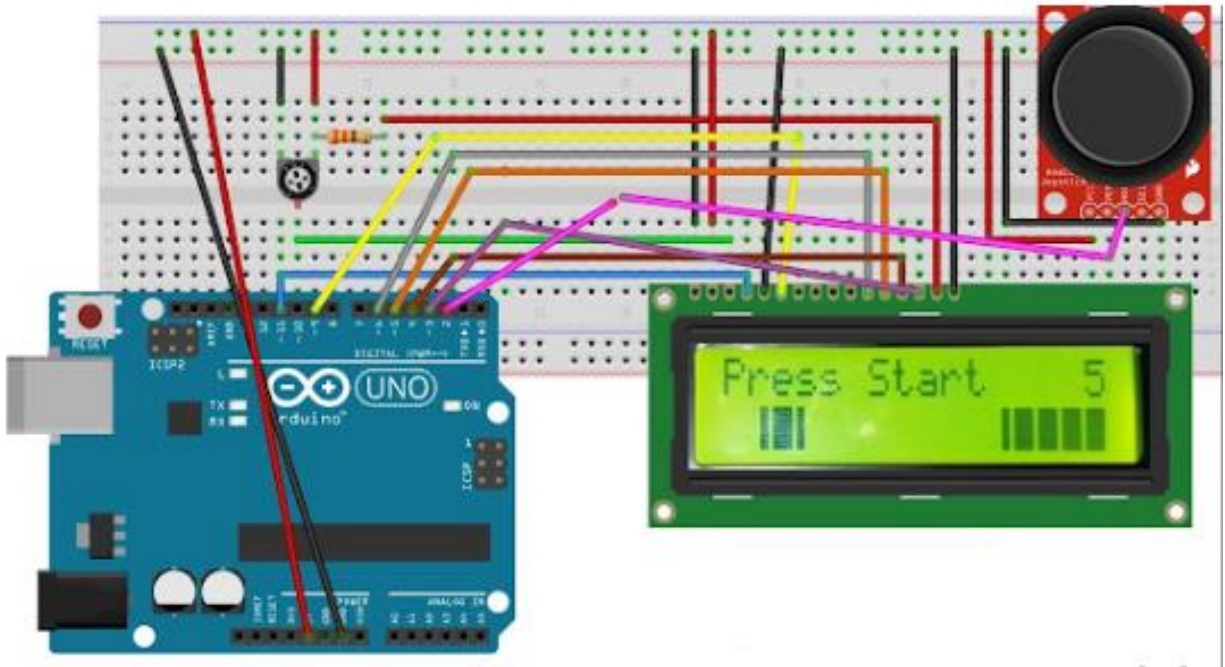
Step 6:

Also we check the game twice to make sure it works completely fine.

Flow chart of the game:



Software simulation:

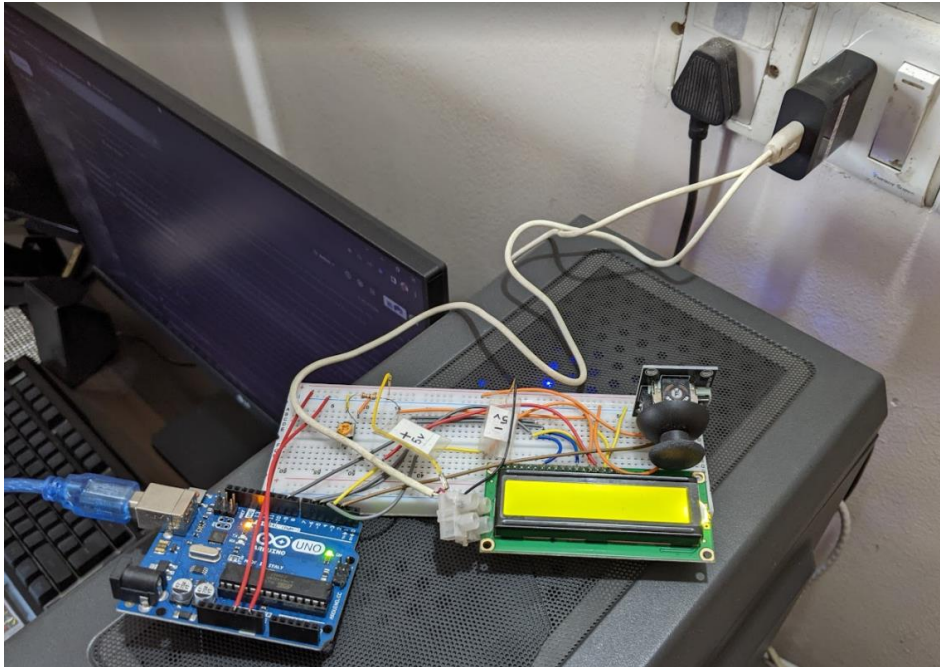


Code:

We use this code:

<https://drive.google.com/file/d/1ND0Mv6fY1KQUt3wmbTW4IUovpRhR4Ubx/view>

Hardware implementation:



After completing entire work

Comment:

By finishing this project we can understand the basic use of the Arduino Uno microcontroller. Also now we can make different small games for children. This project was very helpful for all of us to understand the use of Arduino Uno. By the help of this many electronic devices can be built. This project gave students like us a brief practical example of electronics.

References:

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

https://docs.google.com/document/d/e/2PACX-1vTTsDTalTSxZE6JNkPKn3f-XxToCkmVnvP7XLt-5CWielrqhFtgX7-kVA-LFLLdW3zVMOudwlu_aCNx/pub

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