

‘ARDUINO PAC-MAN GAME USING NOKIA LCD 5110’

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1. INTRODUCTION

1.1 About the project

Pac-Man is a maze arcade game developed and released by Namco in 1980. Outside Japan, the game was published by Midway Games as part of its licensing agreement with Namco America. It is the first game to run on the Namco Pac-Man arcade board. Pac-Man's first adventure chronologically took place in Pac-Man, wherein he had to fight off a group of Ghosts consisting of Blinky, Pinky, Inky and Clyde, while eating all of the Pellets scattered around a maze. Many other titles in the franchise follow the same basic plot, including: Super Pac-Man. Pac-Man Plus.



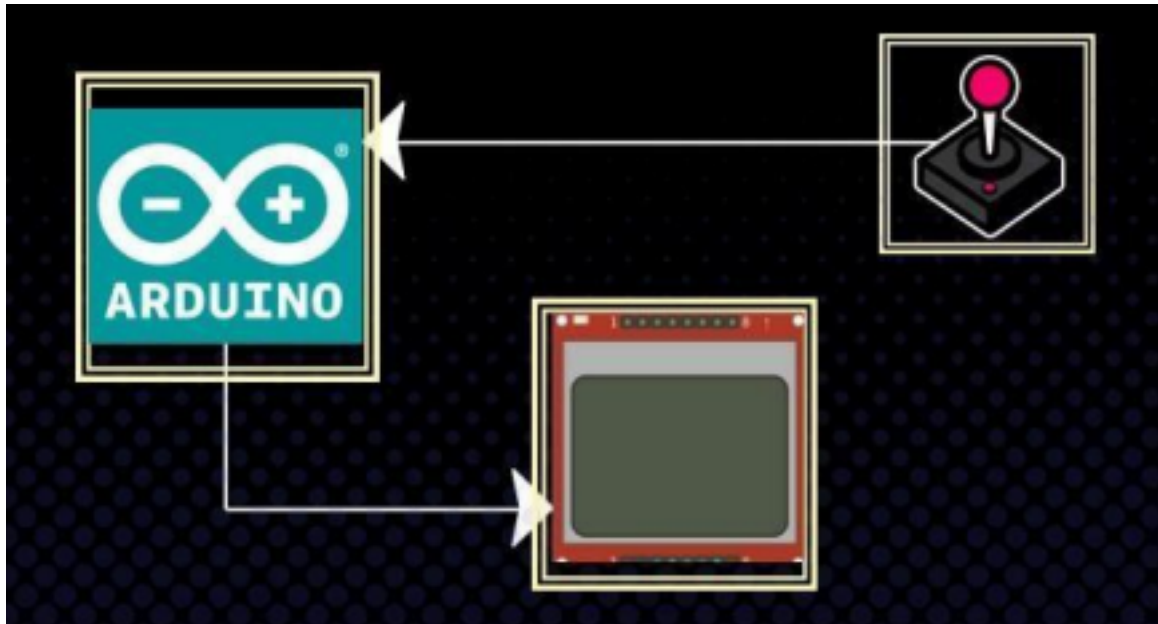
Toru Iwatani

1.2 Brief description:

The player navigates Pac-Man through a maze with no dead ends. The maze is filled with Pac-Dots, and includes four roving multi-colored ghosts: Blinky, Pinky, Inky, and Clyde. There is a passageway from the left side of the screen to the right side, one energizer in each of the four quadrants, and bonus fruits that appear in each level. Simply score as many points as you can by eating the small dots all around the maze. 10 points per dot (240 of them). Big points come when you eat 1 of the 4 Big flashing dots called Energizers worth 50 points located in each corner of the maze. While it

has been said otherwise many times, "Pac-Man" does have an ending, although it's not the one you would expect. The end of the game is Pac-Man getting eaten by ghosts, being that it's impossible to keep going forever and eventually you run out of lives and die.

1.3 Block diagram:



2. HARDWARE REQUIREMENT AND SPECIFICATIONS

2.1 List of required components:

| <u>Components</u> | <u>Requirements</u> |
|----------------------|--|
| Arduino | Uno R3 |
| Joystick | Dual axis high quality JoyStick Module |
| LCD | Nokia 5110A |
| Breadboard & jumpers | |

JOYSTICK : A joystick is an input device that can be used for controlling the movement of the cursor or a pointer in a computer device. The pointer/cursor

movement is controlled by maneuvering a lever on the joystick. The input device is mostly used for gaming applications and, sometimes, in graphics applications.

ARDUINO UNO BOARD: We will use Arduino due to its simplicity and it also provides several digital pins to interface with Servo motors and ph modules at the same time. It is very useful when you are prototyping a project. Pin no.9 is connected to the servo motor.

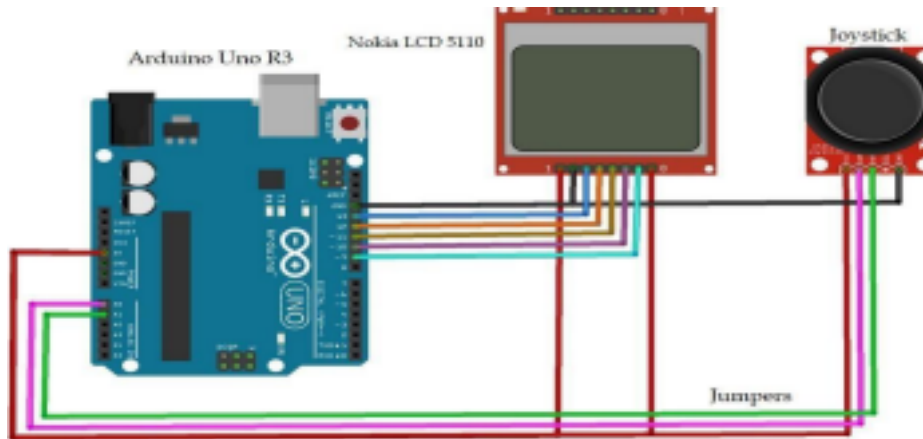
NOKIA LCD 5110: Nokia 5110 LCD Display Module is mounted on an easy to solder PCB. The Nokia 5110 LCD Module uses a Philips PCD8544 LCD driver, which is designed for mobile phones. Nokia 5110 LCD Display Module is a low-cost monochrome LCD module of 84 X 48 pixels that can be used to display rich graphics and text content. This module is a revision that accepts 5V input. So no extra level shifter is needed.

2.2 Cost of components:

- Arduino Uno R3 - 500 Rs
- Nokia LCD 5110 - 255 Rs
- Joystick - 50 Rs
- 1 x Breadboard - 100 Rs
- Jumper wires - 40 Rs

3. CONNECTIONS

3.1 Nokia LCD 5110 connections:



4. SOFTWARE REQUIREMENTS AND SPECIFICATIONS

4.1 User characteristics:

- C (pronounced like the letter c)[6] is a general-purpose computer programming language. It was created in the 1970s by Dennis Ritchie, and remains very widely used and influential. By design, C's features cleanly reflect the capabilities of the targeted CPUs.
- It has found lasting use in operating systems, device drivers, protocol stacks, though decreasingly[7] for application software. C is commonly used on computer architectures that range from the largest supercomputers to the smallest microcontrollers and embedded systems.

4.2 Specific requirements:

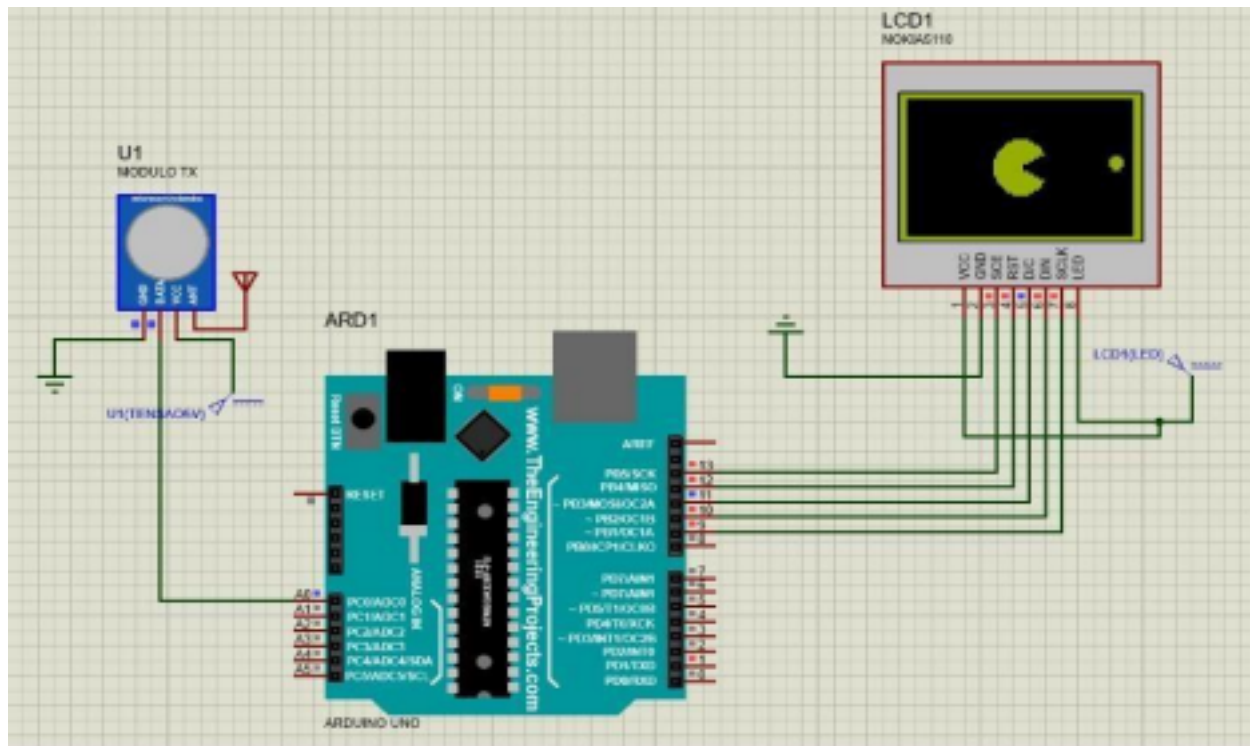
| <u>Components</u> | <u>Requirements</u> |
|----------------------|-------------------------------------|
| Arduino IDE | 64-bit operating system(windows 10) |
| Programming language | C |

4.3 Algorithm:

1. Start.
2. Include the header file as LCD5110_Graph.h and avr/pgmspace.h
3. Include libraries for graphics and sensors used.
4. Assign pin no to the particular sensors and LCD 5110 along with a joystick.
5. Set baud rate as 115200 in serial monitor..
6. Attach LCD 5110 and joystick to the respective pins of arduino uno.
7. Give commands to the joystick to operate.
8. Game starts displaying on the LCD.
9. It displays welcome and by clicking on the joystick the Game starts. 10.
When you lose the game, it restarts by clicking on the joystick and you can play it again.
11. Stop.

5. HARDWARE ON PROTEUS

5.1 Interfacing Diagram:



6. ADVANTAGES

1. Boosts concentration.
2. Teaches independence.
3. Speeds up decision-making.
4. Encourages healthy competition.

7. CONCLUSION

When pacman eats all the dots, the player advances to the next level. If pacman makes contact with a ghost, he will lose life, the game ends. But if pacman eats up all the dots in the maze, the player is the winner. Pacman is known to be one of the most popular arcade games in the world. It is easy to learn the game. The game-play of Pac-Man is

super simple. Its user-friendliness makes it awesome to play, attracting players of most ages. All you have to do is eat the dots and avoid getting caught. Pac-Man gameplay promotes learning and, therefore, brain development. In order to keep the brain healthy, it has to constantly learn and keep active.

8. REFERENCES

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2. <https://www.viralsciencecreativity.com/post/arduino-pac-man-game-nokia-5110-joystick>
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