UNIVERSITY INSTITUTE of COMPUTING
Asia's Fastest Growing University

NAAC GRADE A+ ACCREDITED UNIVERSITY

PROJECT TITLE

Student Name: Abhay Kumar **UID:24BCA10473**
Branch: BCA **Section/Group: 24BCA-7-A**
Semester: 1st **Date of Performance:**
Subject Name- computer programing **Subject Code:24CAH-101**

1. **Aim/Overview of the practical: To develop Rock Paper Scissor Game in the C programming language.**

2. **Task to be done:**

- Set **Up the Development Environment**
- **Write the Program**
- **Add Input Validation (Optional)**
- **Test the Program**
- **Document the Code**
- **Reflect and Improve**

3. **Algorithm**

Algorithm for Rock-Paper-Scissors

Here's a step-by-step algorithm to implement the Rock-Paper-Scissors game:

1. Start the Game
- Display a welcome message.

2. Initialize Variables
- Set counters for player wins, computer wins, and ties to zero.

3. Display Options
- Present the options to the player:
- Rock
- Paper
- Scissors

4. Player Input
- Prompt the player to select an option (rock, paper, or scissors).
- Validate the input to ensure it's one of the three options.

5. Computer Selection
- Randomly generate a choice for the computer (rock, paper, or scissors).

6. Display Choices
- Show both the player's and computer's selections.

7. Determine the Winner
- Compare the choices:
- If player choice is rock and computer choice is scissors, player wins.

- If player choice is scissors and computer choice is paper, player wins.
- If player choice is paper and computer choice is rock, player wins.
- If both choices are the same, it's a tie.
- For all other combinations, the computer wins.

8. Update Scores

- Increment the appropriate win counter (player, computer, or ties).

9. Display Current Scores

- Show the current score after each round.

10. Continue Playing

- Ask the player if they want to play another round.
- If yes, repeat from step 4.
- If no, proceed to the next step.

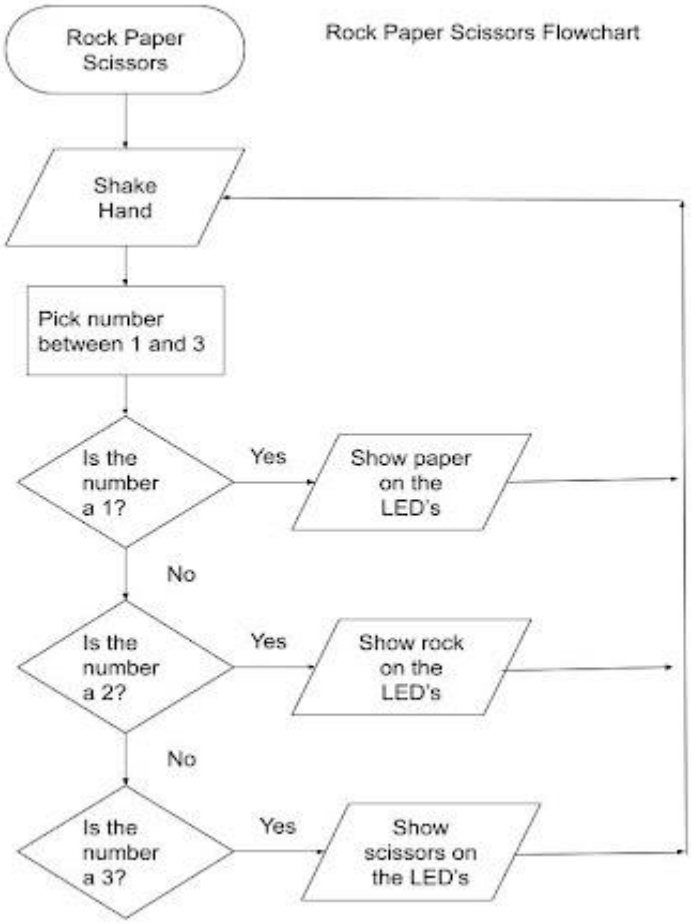
11. End the Game

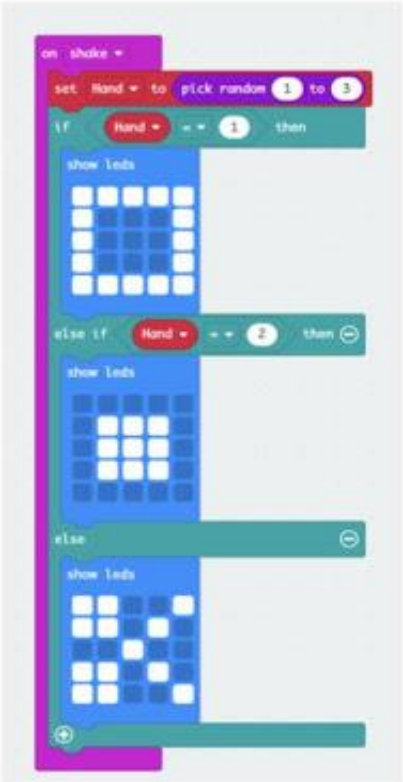
- Display final scores.
- Thank the player for participating.

12. Exit

- End the program.

4 /Flowchart :


Rock Paper Scissors
Rock Paper Scissors Flowchart
Shake Hand
Pick number between 1 and 3
Is the number a 1?
Yes
Show paper on the LED's
No
Is the number a 2?
Yes
Show rock on the LED's
No
Is the number a 3?
Yes
Show scissors on the LED's


on shake
set Hand to pick random 1 to 3
if Hand = 1 then
show leds
else if Hand = 2 then
show leds
else
show leds

5. Code for experiment/practical:

```
#include <math.h>
#include <stdio.h>
#include <stdlib.h>
#include <time.h>


int game(char you, char computer)
{


    if (you == computer)
        return -1;


    if (you == 's' && computer == 'p')
        return 0;

            else if (you == 'p' && computer == 's') return 1;


    if (you == 's' && computer == 'z')
        return 1;



    else if (you == 'z' && computer == 's')
        return 0;


    if (you == 'p' && computer == 'z')
```

```
        return 0;


    else if (you == 'z' && computer == 'p')
        return 1;
}

int main()
{

    int n;

    char you, computer, result;


    srand(time(NULL));


    n = rand() % 100;



    if (n < 33)


        computer = 's';

    else if (n > 33 && n < 66)


        computer = 'p';
```

```
        else
                computer = 'z';

        printf("\n\n\n\n\t\t\t\tEnter s for STONE, p for PAPER and z for
SCISSOR\n\t\t\t\t\t\t\t");


        scanf("%c", &you);


        result = game(you, computer);

        if (result == -1) {
                printf("\n\n\t\t\t\tGame Draw!\n");
        }
        else if (result == 1) {
                printf("\n\n\t\t\t\tWow! You have won the game!\n");
        }
        else {
                printf("\n\n\t\t\t\tOh! You have lost the game!\n");
        }
                printf("\t\t\t\tYOu choose : %c and Computer choose :
%c\n",you, computer);
        return 0;
}
```

4. **Result/Output/Writing Summary:**

Objective:

The aim of the Rock-Paper-Scissors lab was to explore the mechanics of decision-making and randomness in gameplay, enhancing understanding of programming concepts through simulation.

Game Overview:

Rock-Paper-Scissors is a hand game played between two players, where each player simultaneously chooses one of three options: rock, paper, or scissors. The rules are simple:

- Rock crushes scissors (rock wins).

- Scissors cuts paper (scissors win).

- Paper covers rock (paper wins).

- If both players choose the same option, the game is a tie.

Procedure:

1. Setup: Each player selects their choice (rock, paper, or scissors) without revealing it to the other.

2. Play: Once both players have made their selections, they reveal their choices simultaneously.

3. Determine Winner: Compare the choices according to the established rules to declare the winner or a tie.

4. Repetition: The game can be played multiple rounds, keeping track of wins and losses.

Results:

- Each round was played and results were recorded.

- A tally of wins for each player was maintained.

- Statistical analysis (if applicable) was performed to evaluate the outcomes over multiple rounds.

Observations:

- The game showcased the concept of randomness in decision-making.

- Patterns in player choices emerged over multiple rounds, allowing for strategic thinking.

- Engaging in the game highlighted the psychological aspects of predicting an opponent's choice.

Conclusion:

The Rock-Paper-Scissors simulation provided valuable insights into game theory, probability, and strategic decision-making. It emphasized the balance between randomness and predictability in competitive scenarios. Future experiments could involve programming the game to include AI opponents, allowing for further exploration of strategy and decision-making algorithms.

Recommendations:

- Incorporate variations of the game (e.g., adding more options like Lizard and Spock) to explore complexity.

- Analyze player behavior over a larger number of rounds to identify trends and improve strategic play.

- Experiment with different methods of choice (e.g., random generation vs. player decision) to assess outcomes.

Learning Outcomes: Rock-Paper-Scissors

1. Understanding Game Mechanics:

I learned how the simple rules of Rock-Paper-Scissors create a balanced game, demonstrating foundational concepts of strategy and chance.

2. Programming Fundamentals:

I gained hands-on experience in programming by creating a simulation of the game, which helped reinforce concepts like conditionals, loops, and user input.

3. Decision-Making Skills:

The game highlighted the importance of strategic thinking and predicting opponents' choices, enhancing my decision-making skills in competitive situations.

4. Statistical Analysis:

By tracking and analyzing the outcomes of multiple rounds, I learned how to interpret data and recognize patterns in random events.

5. Collaboration and Communication:

Working in pairs or small groups emphasized the need for clear communication and teamwork when playing the game and discussing strategies, which is essential in collaborative environments.

Evaluation Grid:

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	Demonstration and Performance (Pre Lab Quiz)		5
2.	Worksheet		10
3.	Post Lab Quiz		5