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Rock,Paper and Scissors game

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Semester:1 **Date of Performance:24/10/2024**
Subject Name: Computer Programing **Subject Code:24CAH101**

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

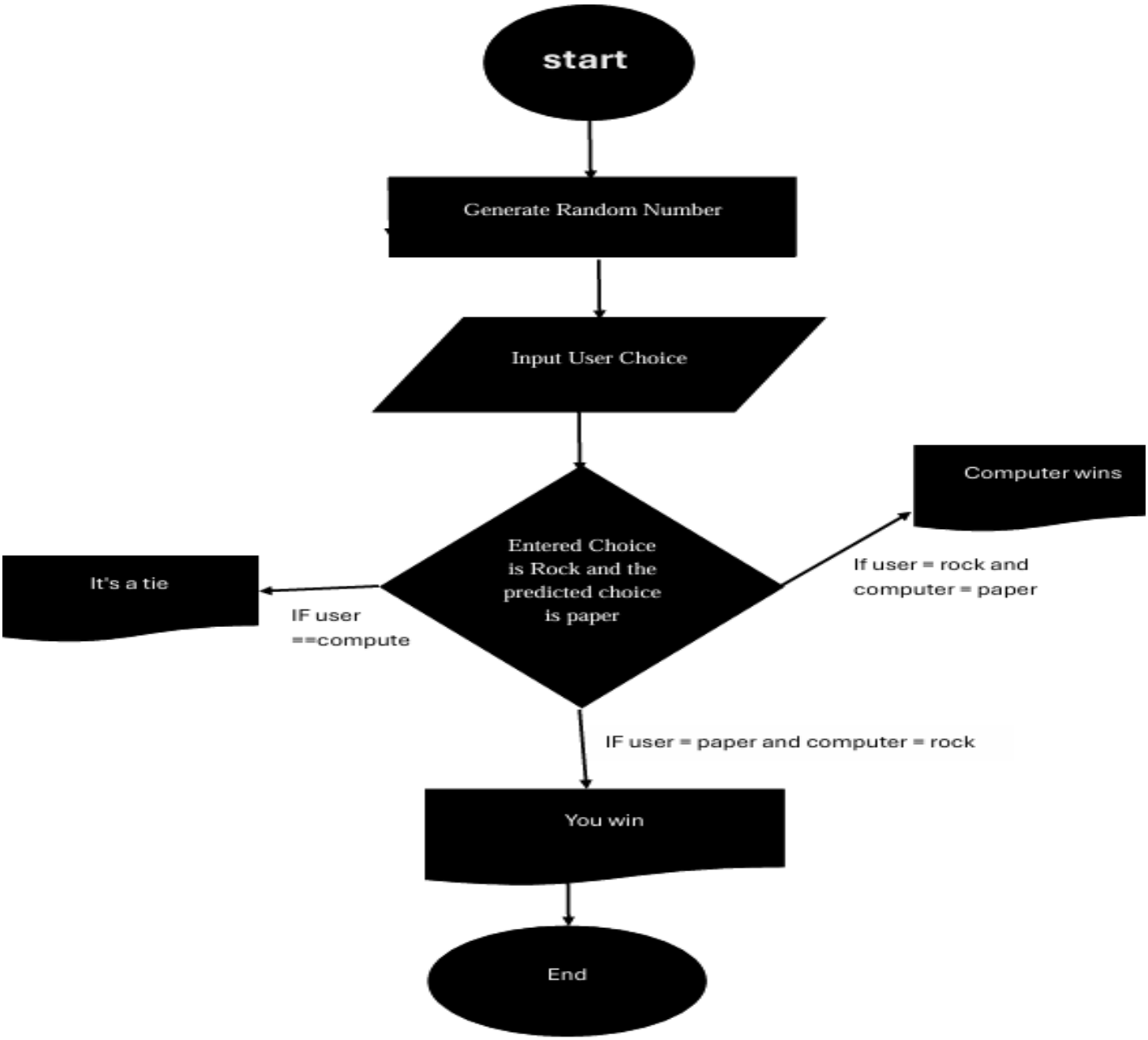
2. **Task to be done:**
- Set Up the Development Environment
- Write the Program
- Add Input Validation (Optional)
- Test the Program
- Document the Code
- Reflect and Improve

3. **Algorithm/Flowchart :**

Algorithm:

1. Start
2. Initialize random number generator.
3. Do the following until the user chooses not to play again:
   1. Prompt the user to enter their choice (0 for Rock, 1 for Paper, 2 for Scissors).
   2. If the input is invalid, display an error message and repeat from step 3.
   3. Generate a random choice for the computer (0, 1, or 2).
   4. Display the computer's choice.
   5. Compare user choice and computer choice:
      - If they are the same, print "It's a tie."
      - If user wins (Rock beats Scissors, Paper beats Rock, Scissors beat Paper), print "You win."
      - Otherwise, print "Computer wins."
   6. End

Flowchart:



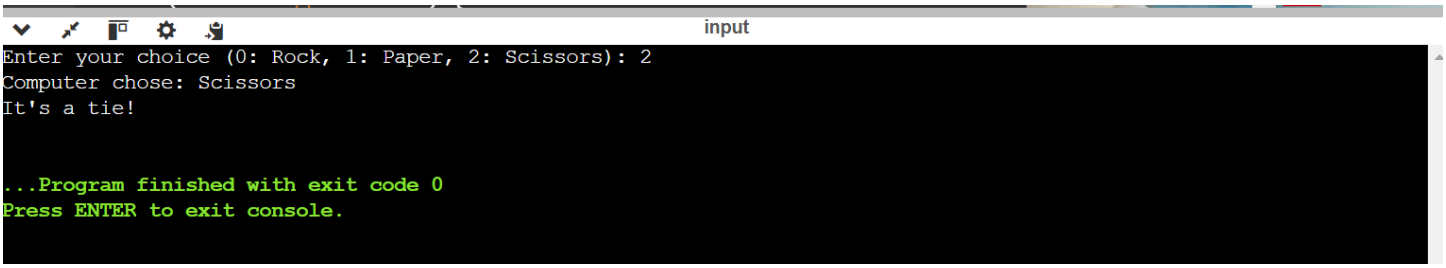
4. Code for experiment/practical:

```
#include <stdio.h>

#include <stdlib.h>

#include <time.h>
```

```
void show(int choice) {
    switch (choice) {
        case 0: printf("Rock\n"); break;
        case 1: printf("Paper\n"); break;
        case 2: printf("Scissors\n"); break;
        default: printf("Invalid choice\n");
    }
}

int main() {
    int user, computer;

    srand(time(0)); // Seed the random number generator

    // User input for their choice
    printf("Enter your choice (0: Rock, 1: Paper, 2: Scissors): ");
    scanf("%d", &user);

    // Validate user input
    if (user < 0 || user > 2) {
        printf("Invalid choice! Please try again.\n");
        return 1;  // Exit the program if input is invalid
    }
```

```
    // Computer makes a random choice
    computer = rand() % 3;
    printf("Computer chose: ");
    show(computer);

    // Determine the winner
    if (user == computer) {
        printf("It's a tie!\n");
    } else if ((user == 0 && computer == 2) ||
               (user == 1 && computer == 0) ||
               (user == 2 && computer == 1)) {
        printf("You win!\n");
    } else {
        printf("Computer wins!\n");
    }

    return 0;
}
```

5. Result/Output/Writing Summary:



Writing Summary:

This C program implements a basic Rock, Paper, Scissors game where the user competes against the computer. The user selects Rock (0), Paper (1), or Scissors (2), while the computer makes a random choice. The program compares the two inputs to determine the winner, displaying either a win, loss, or tie. After each round, the user can choose to play again or exit, allowing multiple rounds of gameplay. The program combines randomization, user input, and game logic for a simple yet engaging experience.

Learning outcomes (What I have learnt):

1. **User Input Handling**: Gained experience in collecting and validating user input in C.
2. **Random Number Generation**: Learned how to use `rand()` for generating random choices.
3. **Conditional Logic**: Developed skills in using conditional statements to determine game outcomes.
4. **Loop Control**: Implemented loops for allowing repeated gameplay, improving user interaction.
5. **Modular Code Design**: Improved code organization by separating functionality into functions.
6. **Basic Game Design**: Learned how to design simple interactive applications with clear prompts and feedback.
7. **Debugging**: Enhanced troubleshooting skills to manage errors and refine the program.
8. **C Programming Fundamentals**: Reinforced key C concepts like data types, control structures, and I/O operations.

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