SRM UNIVERSITY, AP

Introduction to Programming Using C

Project Report On

"Stone, Paper, Scissors Game"

Submitted in partial fulfillment for the award of the degree in

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

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ABSTRACT

The project is a game to be played between the computer and the user, developed using C language. The 'Stone, Paper, Scissors Game' Project that we will develop will have following key features:

- Run the program for the **number of rounds the user wants to play** using **a for loop**.
- **Generate a random response for the computer** using **rand() function** in C language.
- **Declare the winner of each round** using **'if statements'**.
- **Count the total wins** for both the player and computer.
- After all the rounds are completed, **display the overall winner.**

CONTENTS

CHAPTER 1

INTRODUCTION

Rock, Paper, Scissors is a childhood game that we intend to program and create for computers. Our project should work as follows:

1. When the program begins, the user is asked for the number of rounds that he wants to play. The source code is looped for that many times.

2. Next, a random number in the range of 1 through 3 is generated using the rand() function. If the number is 1, then the computer has chosen rock. If the number is 2, then the computer has chosen paper. If the number is 3, then the computer has chosen scissors.

3. Then, the user enters his or her choice, i.e., 1 for rock, 2 for paper and 3 for scissors.

4. The computer's choice is displayed.

5. A winner for the round is selected according to the following rules:

    - If one player chooses rock and the other player chooses scissors, the rock wins. (The rock smashes the scissors.)

    - If one player chooses scissors and the other player chooses paper, the scissors win. (Scissors cuts paper.)

    - If one player chooses paper and the other player chooses rock, then paper wins. (Paper wraps rock.)

    - If both players make the same choice, it's a draw.

6. After all the rounds are over, the player with the most wins is declared the winner of the entire game.

CHAPTER 2

OBJECTIVE

The stone, paper, scissors game is often played for fair choosing during a dispute or while making unbiased decisions. The objective of our project is to develop this fun game to play on computer. Using our knowledge of C language, we are trying to recreate the stone, paper, scissors hand game that we played in our childhood so that you can play against the computer.

CHAPTER 3

SYSTEM REQUIREMENTS

3.1 SOFTWARE REQUIREMENTS:

- Language used: C
- Operating System: Windows 7
- Platform/IDE: Replit (Online IDE)

3.2 HARDWARE REQUIREMENTS:

- Hard Disk: 512 GB
- Processor: Intel Core i3 (Minimum)

CHAPTER 4

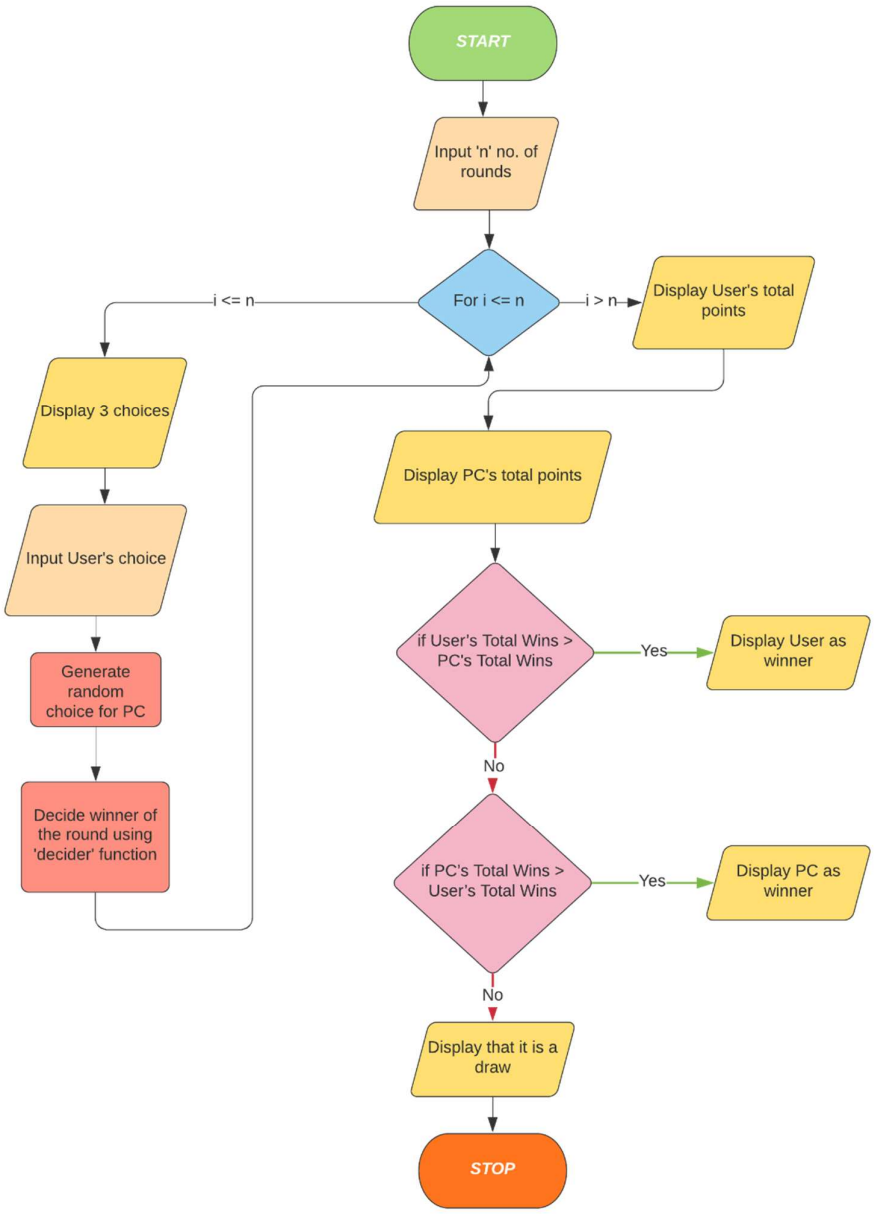
SYSTEM DESIGN

The project is designed in a simplistic manner using functions and if-else if ladder. Given below is the algorithm of the project:

(Algorithm)

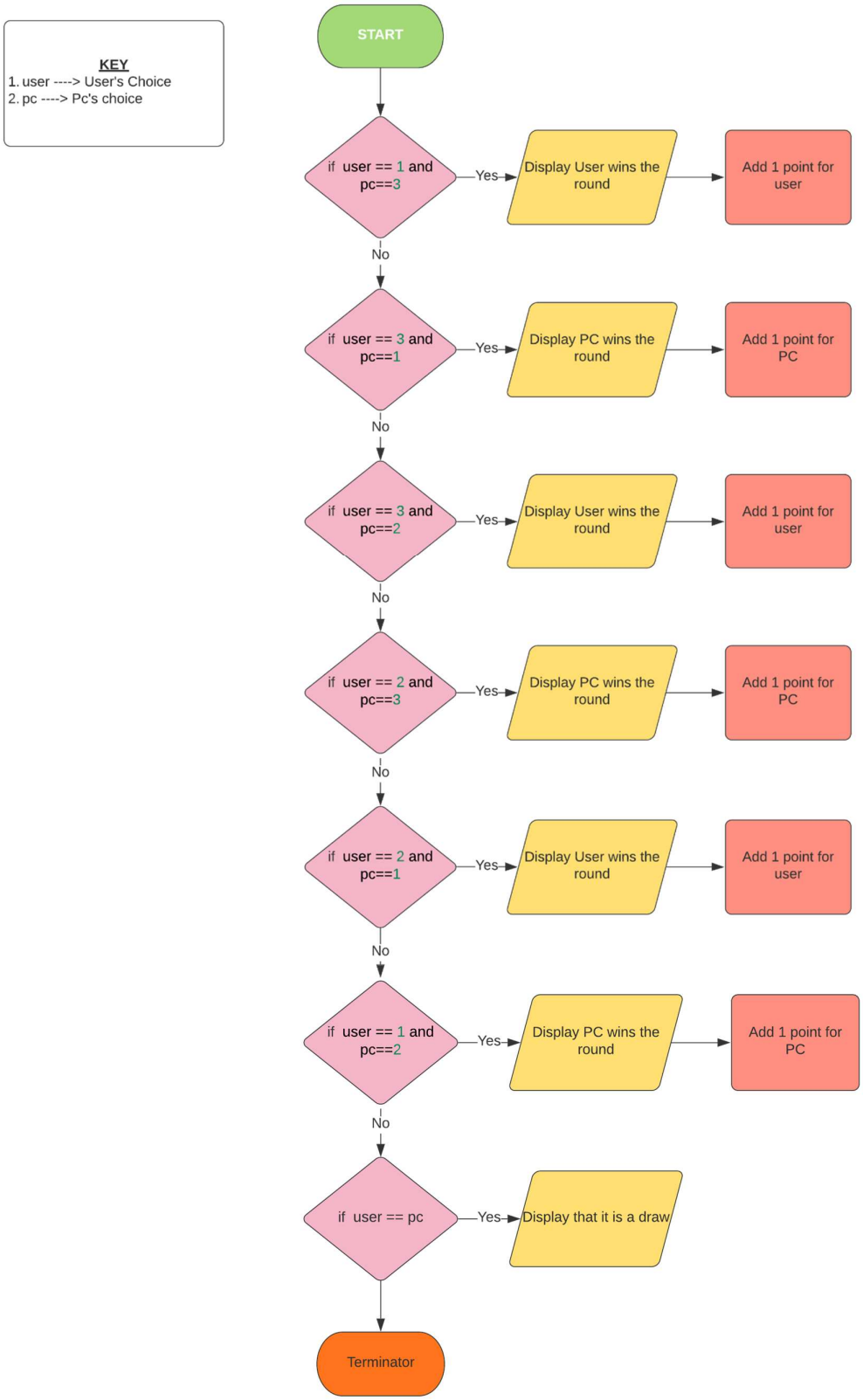
1. START
2. Input ‘n’ no. of rounds.
3. For n times, repeat step 4 to 10:
4. Display the 3 choices.
5. Input User’s choice.
6. Generate random choice for PC using rand().
7. If a player chooses rock and the other player chooses scissors:
    a. The rock wins.
    b. Give one point to winner.
8. If a player chooses scissors and the other player chooses paper:
    a. The scissors win.
    b. Give one point to winner.
9. If a player chooses paper and the other player chooses rock:
    a. The paper wins.
    b. Give one point to winner.
10. If both players make the same choice:
    a. It's a draw.
    b. No one gets point.
11. Display User’s Total Wins.
12. Display Computer’s Total Wins.
13. If User’s Total Wins > Computer’s Total Wins:
    a. Display “User Wins”.
14. If Computer’s Total Wins > User’s Total Wins:
    a. Display “Computer Wins”.
15. STOP

Flowchart of the program is a shown:



(Fig. 4.1 Program Flowchart)

Flowchart of the ‘decider’ function is as shown:



(Fig. 4.2 ‘decider’ Function Flowchart)

CHAPTER 5

SYSTEM IMPLEMENTATION

The project is implemented by including the following:

- Header files included are as shown:

```
1   #include <stdio.h>
2   #include <stdlib.h>
3   #include <time.h>
```

(Fig. 5.1 Header Files Included)

- The User's choice is collected using scanf() as shown:

```
16      //Displaying 3 choices
17      printf("\n\n(1) Stone\n(2) Paper\n(3) Scissors");
18      printf("\nEnter your choice number:");
19      scanf("%d",&userChoice);
```

(Fig. 5.2 Input User's Choice)

- PC's choice is randomly generated using rand() from 'stdlib.h' header file as shown:

```
21      //Generate random choice for PC
22      srand(time(0));
23      pcChoice = rand()%3 +1;  //Value of pcChoice can be either 1,
        2 or 3.
```

(Fig. 5.3 Generating random choice for PC)

- The winner of each round is decided and awarded 1 point using the ‘decider’ function as shown:

```
60   void decider(int user, int pc)
61   {
62     if (user == 1 && pc==3)
63     {
64       printf("\nUser wins the round!");
65       userWins+=1;
66     }
67     else if (user==3 && pc==1)
68     {
69       printf("\nPC wins the round!");
70       pcWins+=1;
71     }
72     else if (user==3 && pc==2)
73     {
74       printf("\nUser wins the round!");
75       userWins+=1;
76     }
77     else if(user==2 && pc==3)
78     {
79       printf("\nPC wins the round!");
80       pcWins+=1;
81     }
82     else if(user==2 && pc==1)
83     {
84       printf("\nUser wins the round!");
85       userWins+=1;
86     }
87     else if(user==1 && pc==2)
88     {
89       printf("\nPC wins the round!");
90       pcWins+=1;
91     }
92     else if(user==pc)
93     {
94       printf("\nIts a draw!");
95       printf("\n\tNo one gets the point.");
96     }
97   }
```

(Fig. 5.4 Function to decide winner of each round)

- The total points scored by each player and the overall winner is declared as shown:

```
42   //Declaring The Overall Winner
43   printf("\n\nTotal User Wins: %d", userWins);
44   printf("\nTotal PC Wins: %d", pcWins);
45   printf("\n\n\n\bTHE OVERALL WINNER");
46   printf("\n******************");
47   if (userWins > pcWins)
48     printf("\nYOU are the Overall Winner!!!\nCongratualtions!!!");
49
50   else if(pcWins > userWins)
51     printf("\nPC is the Overall Winner!!!\nBetter Luck Next Time!");
52   else if(pcWins == userWins)
53   {
54     printf("\nBoth Scored the same points!");
55     printf("\nPlay again to decide the winner.");
56   }
```

(Fig. 5.5 Declaring Overall Winner)

CHAPTER 6

RESULTS

Console Shell

```
clang-7 -pthread -lm -o main main.c
./main
Welcome to the game of Stone, Paper, Scissors!!!
Enter the number of rounds you want to play:3


ROUND 1
(1) Stone
(2) Paper
(3) Scissors
Enter your choice number:1
PC Choice: Stone
Its a draw!
    No one gets the point.

ROUND 2
(1) Stone
(2) Paper
(3) Scissors
Enter your choice number:2
PC Choice: Stone
User wins the round!

ROUND 3
(1) Stone
(2) Paper
(3) Scissors
Enter your choice number:3
PC Choice: Paper
User wins the round!

Total User Wins: 2
Total PC Wins: 0


THE OVERALL WINNER
******************
YOU are the Overall Winner!!!
Congratualtions!!!
```

(Fig. 6.1 Sample Input-Output)