MARRI LAXMAN REDDY
GROUP OF INSTITUTIONS
MLR INSTITUTE OF TECHNOLOGY
(UGC AUTONOMOUS)
Laxman Reddy Avenue, Dundigal, Hyderabad - 500 043, Telangana , India

Programming For Problem Solving

Project Presentation

By
N. Ajay Kumar
R.No: 23R21A05D0

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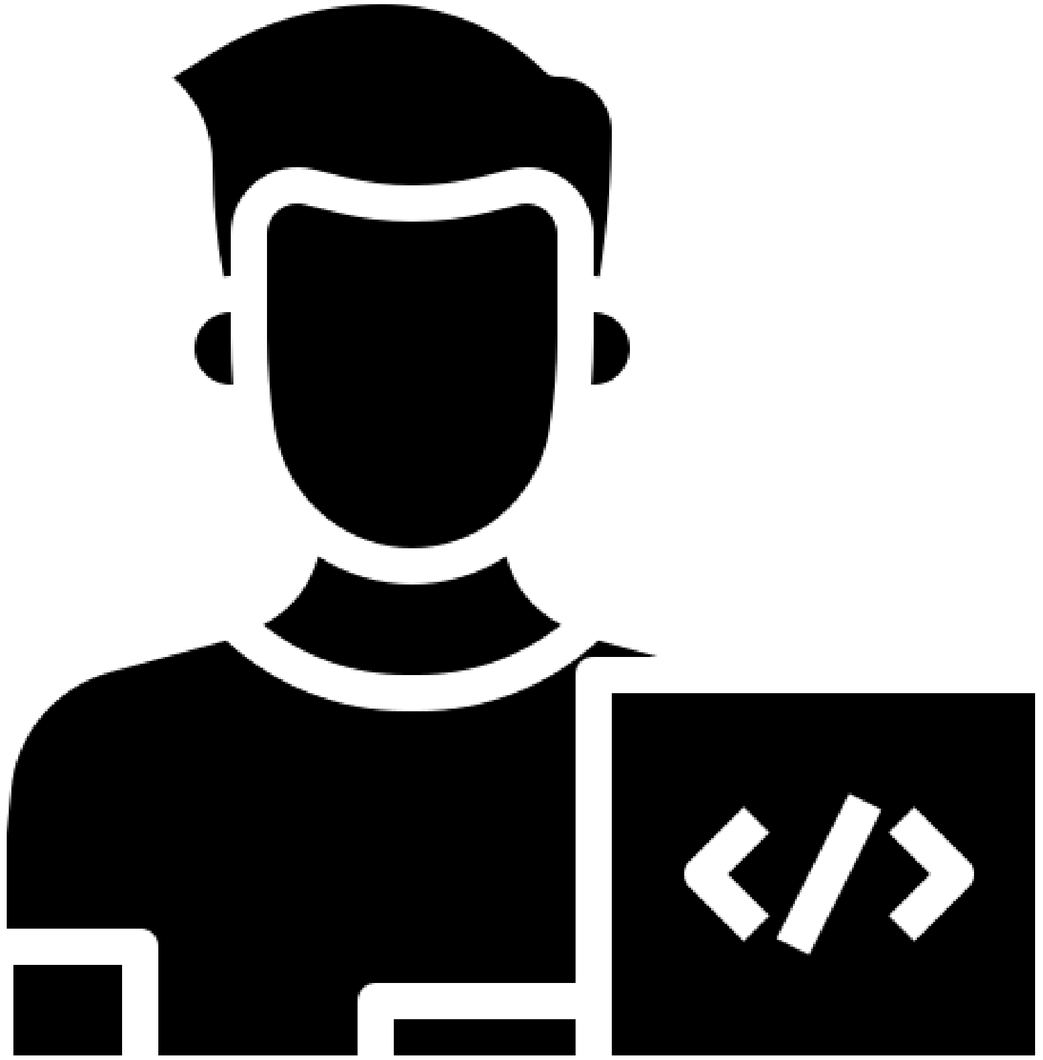
introducing
ABOUT ME

N. Ajay Kumar
R.No: 23R21A05D0
CSE-C



PROBLEM DESCRIPTION

ROCK PAPER SCISSOR IS ONE OF THE MOST COMMON GAMES PLAYED BY EVERYONE ONCE IN HIS CHILDHOOD, WHERE TWO PERSONS USE THEIR HANDS AND CHOOSES RANDOM OBJECTS BETWEEN ROCK, PAPER, OR SCISSOR, AND THEIR CHOICE DECIDES THE WINNER BETWEEN THEM. WHAT IF A SINGLE PERSON CAN PLAY THIS GAME? WITH A COMPUTER, JUST BY USING A SINGLE C APPLICATION, WE CAN DESIGN THE GAME ROCK PAPER SCISSOR APPLICATION JUST USING BASIC C KNOWLEDGE LIKE IF-ELSE STATEMENTS, RANDOM VALUE GENERATION, AND INPUT-OUTPUT OF VALUES. CREATED APPLICATION HAS A FEATURE WHERE WE CAN PLAY THE GAME, AND MAINTAIN THE SCORE OF PERSON 1 AND PERSON 2.

ANALYSIS

ROCK PAPER SCISSOR (WHICH IS ALSO CALLED STONE PAPER SCISSOR) IS A HAND GAME AND PLAYED BETWEEN TWO PEOPLE, IN WHICH EACH PLAYER SIMULTANEOUSLY FORMS ONE OF THREE SHAPES. THE WINNER OF THE GAME IS DECIDED AS PER THE BELOW RULES:

- ROCK VS PAPER -> PAPER WINS.
- ROCK VS SCISSOR -> ROCK WINS.
- PAPER VS SCISSOR -> SCISSOR WINS.

IN THIS GAME, THE USER WILL BE ASKED TO MAKE CHOICE AND ACCORDING TO THE CHOICE OF USER AND COMPUTER AND THEN THE RESULT WILL BE DISPLAYED ALONG WITH THE CHOICES OF BOTH COMPUTER AND USER.

APPROACH

Below is the functionality that needed to be implemented in the program:
main() function:

- It consists of the declaration of the variables.
- printf() and scanf() functions for displaying the content and taking input from the user. It also contains two predefined functions:
  - srand() and rand() which are used to generate random numbers in the range [0, RAND_MAX) and srand() especially will help to generate a random number at each time.
  - Take modulo of random number generated with 100 to make its range between (0 and 100).
  - As the range is up to 100 only, the distribution among all the options i.e., stone, paper, and scissors is equal as all of them have an equal probability of coming.

Note: This random number will decide the choice of computer as:

- If the number is between 0-33 then the choice will be Stone.
- If the number is between 33-66 then the choice will be Paper.
- If the number is between 66-100 then the choice will be Scissors.
-

game() function: This function consists of if-else statements that will compare the choice of user and computer. If the user wins then it will return 1. Otherwise, if the computer wins then it will return 0. If it is a tie, it will return -1.

C PROGRAM

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

// Function to implement the game
int game(char you, char computer)
{
    // If both the user and computer
    // has choose the same thing
    if (you == computer)
        return -1;

    // If user's choice is stone and
    // computer's choice is paper
    if (you == 's' && computer == 'p')
        return 0;

            // If user's choice is paper and
            // computer's choice is stone
            else if (you == 'p' && computer == 's') return 1;


}
```

```c
// If user's choice is stone and
  // computer's choice is scissor
  if (you == 's' && computer == 'z')
      return 1;

  // If user's choice is scissor and
  // computer's choice is stone
  else if (you == 'z' && computer == 's')
      return 0;

  // If user's choice is paper and
  // computer's choice is scissor
  if (you == 'p' && computer == 'z')
      return 0;

  // If user's choice is scissor and
  // computer's choice is paper
  else if (you == 'z' && computer == 'p')
      return 1;
}
```

```
int main()
{
    // Stores the random number
    int n;

    char you, computer, result;

    // Chooses the random number
    // every time
    srand(time(NULL));

    // Make the random number less
    // than 100, divided it by 100
    n = rand() % 100;

    // Using simple probability 100 is
    // roughly divided among stone,
    // paper, and scissor
    if (n < 33)

        // s is denoting Stone
        computer = 's';
    else if (n > 33 && n < 66)
        // p is denoting Paper
        computer = 'p';

    // z is denoting Scissor
    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");

    // input from the user
    scanf("%c", &you);

    // Function Call to play the game
    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;
}
```

OUTPUT

```
Enter s for STONE, p for PAPER and z for SCISSOR
```

```
                                Enter s for STONE, p for PAPER and z for SCISSOR
                                z


                                Game Draw!
                                Your choice : z and Computer's choice : z

Process returned 46 (0x2E)   execution time : 9.935 s
Press any key to continue.
```

Thank You