Report

Implementing a Two-Player Yahtzee Game in C

SE1012 Programming Methodology Assignment

1st year 1stemester - 2024

Student Name: Senarath.D.M.G.R.L
Student ID: IT24101673

SE1012 Programming Methodology Assignment

Implementing a Two-Player Yahtzee Game in C

• The development of the Yahtzee game was divided into 4 major parts.

1. Basic Game Mechanics Implementation.
2. Human Player Implementation.
3. AI player Implementation.
4. Overall Integration of the above sectors together.

Basic Game Mechanics Implementation

1. Creating variables for human player and need AI to play the game.
2. Instructions and other information for the game.
3. Reading dice to get random numbers (1 to 6 numbers).
4. Enter the numbers into the respective player dice roll array.
5. Print and display the scorecard readings after them when the program wants to print the readings.
6. For the following combinations, the parameters serve to re-score when dice readings pass.
7. Taking the dice readings and the corresponding number, a single function is created to assign the score corresponding to the number selected by the AI or human player.

Human Player Implementations.

Create the functions “startFirstDiceRoll and secondAndThirdRoll ”which are used to roll the dice. These functions are designed according to the preference of the human player who can choose any number to roll or keep the dice three times.

The values after the first instance run are automatically stored in the array. The player is asked whether he wants to reroll or not and asks which of the received values should be kept.

The score of the two given category players are displayed each round, and the human player is prompted to enter the player's chosen category for the current dice reading after the rolling dice. A function is created to check whether that category has been used before or not. Then the score is calculated and displayed for the player.

AI player Implementation

After each roll, the AI determines which of the maximum categories it can place from the first received values. If a category is selected at that time, the roll from the maximum points is ignored until the final round.

If it is difficult to choose at that time, the dice are rolled twice, keeping the highest values. Not only that, if there are three equal values of the relic cubes to be received, the dice are re-rolled keeping all three values. By re-rolling, we hope to get four of the same type or Yahtzee combination.

Overall Integration of the sub sections.

After developing each of the mentioned parts, the components were integrated. It was a bit difficult in the integration because the mentioned parts were created with separate functions. Developed a more user-friendly UI for increased user interactions.

The user can give their own name as they wish. The computer name is given to the AI. The categories which the two players already selected are updated after each round.

Before playing the game, the necessary rules are given to give the player an opportunity to get a description of how the points are awarded. At the end it displays to the user how the two players scored and who is the winner.

The game displays the dice rolled by the AI. This increases the transparency between the human player and the AI.

The player can run the game forward without any problem as this task is done using many functions.

Challenges I faced during implementation and how I addressed them.

1. After creating the program, it did not work as I thought that was the main problem I faced.

To solve this, I used the "printf" command in each function to display the variables I checked in the program. This way I could easily observe how the function executing. After that, it is easy to figure out how to correct the program as desired. I have used it to solve many problems.

2. Another problem is in its AI development department.

It was very difficult to select the category related to the values obtained by rolling the dice for the first time by AI. If there are five identical numbers, you can select the Yahtzee category without re-rolling, or if there are only four, you can re-roll and see if you get Yahtzee, but if you do not get it, you will be put in the four of kind category. But if there are only three equals, check whether you get four of kind or full house or Yahtzee and refer to the relevant categories.

In addition to those cases, if the values obtained in the first time are not received in this way, only the highest values are kept and re-rolled. This is included in the category that can be applied in the last time and the relevant score is received.

3. There is a slight problem in displaying the marks received.

There I prepared a table related to the relevant thirteen categories and using printf function to display the related marks for the category, I was able to solve the problem in displaying the related marks by opting to use pointers.