Make a Yahtzee game using Python

Programming Languages
(SWE3006_42)

Assignment 2

Due date: 2024/10/10

What is Yahtzee

- Yahtzee is a multiplayer dice game. The objective of the game is to score points by rolling five dice to make certain combinations.
- A game consists of 13 rounds in total.
- After each round, the player chooses which scoring category is to be used for that round. (You can only score once on each category)
- Each round, players have 2 more re-roll opportunities, with options to keep certain dices.
  - Ex) First roll: 1,1,3,5,6 => keep the two 1s, and re-roll the rest
    => Result: 1,1,2,1,4
    => keep 2 and 4 and re-roll the rest
    =>Result: 3,2,2,4,4
- You can try playing the game at https://cardgames.io/yahtzee/

Yahtzee. (2023, September 22). *Wikipedia.* https://en.wikipedia.org/wiki/Yahtzee.

Scoring Categories – upper section

Category	Description	Score	Example
Aces	Any combination	The sum of dice with the number 1	 scores 3
Twos	Any combination	The sum of dice with the number 2	 scores 6
Threes	Any combination	The sum of dice with the number 3	 scores 12
Fours	Any combination	The sum of dice with the number 4	 scores 8
Fives	Any combination	The sum of dice with the number 5	 scores 5
Sixes	Any combination	The sum of dice with the number 6	 scores 18

Yahtzee. (2023, September 22). *Wikipedia.* https://en.wikipedia.org/wiki/Yahtzee.

Scoring Categories – lower section

Category	Description	Score	Example
Chance	Any combination	Sum of all dice	 scores 14
Three Of A Kind	At least three dice the same	Sum of all dice	 scores 17
Four Of A Kind	At least four dice the same	Sum of all dice	 scores 24
Full House	Three of one number and two of another	25	 scores 25
Small Straight	Four sequential dice (1-2-3-4, 2-3-4-5, or 3-4-5-6)	30	 scores 30
Large Straight	Five sequential dice (1-2-3-4-5 or 2-3-4-5-6)	40	 scores 40
Yahtzee	All five dice the same	50	 scores 50

Yahtzee. (2023, September 22). *Wikipedia.* https://en.wikipedia.org/wiki/Yahtzee.

Assignment Explanation

- You are required to make a simple “Single player” Yahtzee game using python.

- You do not have to implement the “Bonus” category.

- When a round starts, there are 2 options to choose from:
  - Roll: Roll the 5 dice and display two things:
    - 1. The expected score for each unrecorded category when using the current dice combination.
    - 2. The numbers for the 5 dice.
  - Score sheet: Displays the current score recorded in each category. The category that hasn’t been recorded yet will display ‘-’ instead.

- When the dice is rolled(or re-rolled), there are 2 options to choose from:
  - Re-roll: Choose the dice to keep and re-roll the rest. Then display two things:
    - 1. The expected score for each unrecorded category when using the current dice combination.
    - 2. The numbers for the 5 dice.
  - Record: Choose an unrecorded category and record the score. Then move to the next round.

- If all the categories are recorded, display the final score (sum of all categories) and end the game.

Evaluation

- You should submit the python code(s) and a report in icampus (If any one of the two submissions are missing, you will be given 0 points for the assignment):
  - **Code**: {student_id)_yahtzee.py file containing the python code for the game. We will be running this file to assess.
    - You are free to use more python files to code. If so, submit these files as well.
  - **Report**: You should submit 1 pdf report {student_id}_yahtzee_report.pdf with:
    - 1.The explanation of your code.
    - 2.The screen shots of the results from actually playing the implemented game. The screen shots should contain the details below.
      - The screenshots of Roll option, Score Sheet option, Record option should all be included for each round. (You can contain all of these in one screen shot if you want)
      - You only need to include 1 screenshot for each exception handling and describe.
      - A screen shot of your final score.

- **Design**(5pt): If you make the interface neat enough and easy to understand, you will get full points.

- **Code**(30pt):
  - **Roll option**(10pt): Roll the dice and display the two things(expected score and the numbers for each dice)
  - **Score Sheet option**(5pt): Display the current player's score for each category
  - **Re-roll option**(10pt): Same as the Roll option
  - **Record option**(5pt): Choose an unrecorded category and record the score

- **Exception Handling**(10pt): You should handle all types of exceptions. Ex) When player tries to re-roll when all the re-roll counts are used in the round, an exception handling message should be printed.

- **Final Game Score**(5pt): You should at least achieve a score of 180 at the end of the game.

- **Multiplayer Yahtzee implementation**(Extra 10pt): If you implement a two player Yahtzee game, you will get an extra point of 10pt.

  -Note: This is not a mandatory requirement and the extra points will not exceed the maximum points you can get on this assignment. Extra points exist only for you to make up for point losses on other sections. Ex) If you already got full points on other sections(Design, Code, Exception Handling, Final Game Score), additionally implementing a multiplayer version will not get you any extra points.

Any type of plagiarism, code sharing and usage of chat models like Chat-GPT will result in your final grade being F.

Example of the implemented game

```
Round 1
Choose the option.
1. Roll the dice
2. Check the score sheet
2

+-----------------+-------+
|    Category     | Score |
+-----------------+-------+
|      Aces       |   -   |
|      Twos       |   -   |
|     Threes      |   -   |
|      Fours      |   -   |
|      Fives      |   -   |
|      Sixes      |   -   |
|     Chance      |   -   |
| Three of a Kind |   -   |
| Four of a Kind  |   -   |
|   Full House    |   -   |
| Small Straight  |   -   |
| Large Straight  |   -   |
|     Yahtzee     |   -   |
+-----------------+-------+

Current Score : 0


Choose the option.
1. Roll the dice
2. Check the score sheet
1

Result of dice
[4, 5, 6, 6, 5]
Reroll the dice? [Y/N] N
```

```
Result of dice
[4, 5, 6, 6, 5]
Reroll the dice? [Y/N] N

+-----------------+-------+
|    Category     | Score |
+-----------------+-------+
|      Aces       |   0   |
|      Twos       |   0   |
|     Threes      |   0   |
|      Fours      |   4   |
|      Fives      |  10   |
|      Sixes      |  12   |
|     Chance      |  26   |
| Three of a Kind |   0   |
| Four of a Kind  |   0   |
|   Full House    |   0   |
| Small Straight  |   0   |
| Large Straight  |   0   |
|     Yahtzee     |   0   |
+-----------------+-------+

Choose a category to record the score
Chance

Round 2
Choose the option.
1. Roll the dice
2. Check the score sheet
2
```

```
Round 2
Choose the option.
1. Roll the dice
2. Check the score sheet
2

+-----------------+-------+
|    Category     | Score |
+-----------------+-------+
|      Aces       |   -   |
|      Twos       |   -   |
|     Threes      |   -   |
|      Fours      |   -   |
|      Fives      |   -   |
|      Sixes      |   -   |
|     Chance      |  26   |
| Three of a Kind |   -   |
| Four of a Kind  |   -   |
|   Full House    |   -   |
| Small Straight  |   -   |
| Large Straight  |   -   |
|     Yahtzee     |   -   |
+-----------------+-------+

Current Score : 26


Choose the option.
1. Roll the dice
2. Check the score sheet
```