Yahtzee

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CIS-5

Fall 2017

48978

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**INTRODUCTION**

The following pages will cover the design process and development of a text based version of the classic American game Yahtzee. Yahtzee is a dice game that was made by Milton Bradley in the early 1940’s. Since its inception it’s been a staple in family games. In real life the game consists of five dice, a cup, and something to keep score with. In this version of the game no additional materials will be required other than the necessary equipment to run the program.

**THE BASICS**

**Game Objectives**

Have the most points at the conclusion of the thirteenth round.

**Rules**

The rules are simple. Up to four people may play at one time. Single player is also available. Prior to beginning multiplayer games, players take turns rolling all five dice. The player with the largest sum starts the game and the second largest goes second, etc. This order is maintained throughout the entirety of the game. Each game of Yahtzee consists of 13 rounds. Each player begins their turn by rolling all 5 dice. Next the player decides which dice to keep and which to roll again. A player can choose to roll all the dice again or none, concluding their turn. Players may roll up to three times per round. After the third roll players must enter a score *(see the Scoring section pgs. 2-4)*. Players can decide to stop rolling at any point and record the current value of their dice. However, once the player has recorded a score for that round their turn is over. The player with the largest sum of points at the end of the 13th round is deemed the winner!

**Scoring**

The scoring card is separated into a top half and a bottom half totaling 13 categories; 1-6 on top and 7-13 on the bottom:

\*\*\* Upper Section \*\*\*

1)'Aces' - Add all ones in hand, and enter the sum to score.

2)'Twos' - Add all twos in hand, and enter the sum to score.

3)'Threes' - Add all threes in hand, and enter the sum to score.

4)'Fours' - Add all fours in hand, and enter the sum to score.

5)'Fives' - Add all fives in hand, and enter the sum to score.

6)'Sixes' - Add all sixes in hand, and enter the sum to score.

\*\*\* Lower Section \*\*\*

7)'3 of a Kind' - Add all 5 dice, and enter sum to score.

8)'4 of a Kind' - Add all 5 dice, and enter sum to score.

9)'Full House' - 3 of a kind, and a separate pair. Worth 25 points.

10)'Small Straight' - Roll 4 sequential numbers. Worth 30 points.

11)'Large Straight' - Roll 5 sequential numbers. Worth 40 points.

12)'YAHTZEE!' - Roll 5 of the same number. Worth 50 points.

13)'Chance' - Add the total of all five dice, and enter sum to score.

* *Categories 1-6 are easily explained in the above list.*
* *To score categories 7 & 8 you must have three or four dice, respectively, of the same value. Then the player takes the sum of all the dice (not just the ones involved in the “Three/Four of a Kind”) and scores it in the appropriate category.*
* *Categories 9-12 are easily explained in the above list.*
* *Category 13 is used whenever the player chooses, but usually once all available options have been exhausted.*

A player must enter a value into a category each round. Once a category has been scored it is out of play for the rest of the game. **For example**: A player rolls 4 number 5 dice and 1 number 2 die on their first roll and scores it as a “Four of a Kind” using their 5’s. Two turns later the same player rolls 4 number 3 dice and 1 number 6 die on their first roll and wishes to score it as a “Four of a Kind” with 3’s. However, since they have already entered a value into that category two turns earlier, they must choose another scoring option. Instead of scoring a “Four of a Kind” with 3’s the player could score 12 points under the “Fours” category using the sum of their number 3 dice.

**DESIGN PROCESS**

**Function Concepts**

For this program to be successful I needed five functions that essentially accomplished the following tasks:

1. Find the sum of the initial roll of all five dice to find out player order in multiplayer mode.
2. Generate five random dice rolls for normal play (both single player and multiplayer mode).
3. Import title.
4. Import instructions.
5. Import scoring info.

**User Accessibility/Info**

# Starting a multiplayer game.

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| **Fig. 1**   * Initial Execution   + Displays rules and asks for number of players. |
| **Fig. 2**   * Enter desired number of players.   + ‘2’ was entered for this example. * Displays instructions for deciding who begins the game and each subsequent round.   + ‘If ‘1’ was selected for the number of players then this process is skipped (*see Gameplay section to see where the program continues after entering ‘1’*). | | |

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| **Fig. 3**   * The player with the largest sum goes first at the beginning of the game and each round.   + In this example player 1 wins. * Enter player names.   + I chose player 1 and my brother, Matthew, was assigned player 2 **(*prior to rolling*)**. | |
| **Fig. 4**   * After entering the last players name the game continues on as normal (*see Gameplay section*), rotating between players in the assigned order. | |

**Gameplay**

After deciding who goes first, the only difference between single player and multiplayer is the alternating between player turns. Below is an example of a round of single player. For multiplayer the process would be the same with additional players completing their rounds as well. Since the initial execution of single player was also shown in the above example of multiplayer it has been left out *(see* ***Fig. 1 & 2****)*.

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| **Fig. 5**   * Displays result of first roll. * Choose which dice to keep (enter ‘1’) and which to reroll (enter ‘0’).   + The order in which you enter your five numbers for your next roll dictate which dice get rolled and which ones do not. **(*Just look at the picture…)***   + I chose to reroll the 6, 2 and 1 in hopes of getting more 4’s. |

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| **Fig. 6**   * Repeat the process from the first roll.   + I changed my strategy because my second roll gave me a small straight (2, 3, 4, and 5). So, I chose to reroll my second 4 in hopes of getting a large straight. |

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| **Fig. 7**   * Final roll is displayed along with scoring options and instructions.   + I ended up rolling a 6 which gives me a large straight. |

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| **Fig. 8**   * Enter the number corresponding to the category in which you wish to score.   + In my case it was 11 for a large straight * Enter the instructed value to confirm your score.   + I entered 40; the prompted score and point value of a large straight. |

**Termination**

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| * After the last person has completed the 13th round the score is shown in descending order.   + This is the same display for both single player mode and multiplayer mode. |

**IMPLEMENTATION**

**Pseudocode**

*Put in opening comments*

*Bring in system libraries*

*Enter main, then immediately*

*set random number seed*

*Declare all variables, initiate some*

*now and some later.*