

Yahtzee

Objective: Build a game using logic and several classes.

Background:

Yahtzee is a dice game that was originally made by the Milton Bradley Company. The objective is to roll five dice to make various scoring combinations. A game consists of thirteen rounds. After each round a player decides which scoring category is to be used for the round. Once a scoring category is used, it cannot be used again. For example, a Yahtzee is a five-of-a-kind (all five dice are the same value) and earns 50 points, the highest point value category.

The game will be played between two people. Both roll to start the game. The player with the higher roll goes first. If the roll is a tie, then both roll again until one player is chosen.

A scorecard keeps track of the score for each player. The scorecard looks like this:

NAME	1	2	3	4	5	6	3of Kind	4of Kind	Full House	Small Straight	Large Straight	Chance	Yahtzee!
Player1													
Player2													

The names of each player appear in place of “Player1” and “Player2”.

For each turn, the player rolls the five dice. If the player likes the roll, then she can choose a category and score. If the player likes only some of the dice, then she can “hold” the dice she likes and roll the rest. The player can hold and re-roll up to two more times, then a category must be chosen. Once a category is chosen, it cannot be chosen again for the rest of the game. The objective is to fill up all the categories and score the highest point total.

Categories and Scoring:

Upper Scores:

The numbered scores only total the specified die face. If you roll:

<table border="1"><tr><td>0</td></tr><tr><td>0</td></tr><tr><td>0</td></tr></table>	0	0	0	<table border="1"><tr><td>0</td></tr><tr><td>0</td></tr><tr><td>0</td></tr></table>	0	0	0	<table border="1"><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td></tr></table>	0	0	0	0	0	0	<table border="1"><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td></tr></table>	0	0	0	0	0	0	<table border="1"><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td></tr></table>	0	0	0	0	0	0
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and score in the *Fours* category, your total for that entry would be 12. The total would only be 3 if scored in the *Threes* category, or 2 if scored in the *Twos* category.

Lower Scores:

In the lower scores, you score either a set amount defined by the category, or zero if you do not satisfy the category requirements.

3 and 4 of a kind: For 3 of a kind, you must have at least three of the same die faces. If so, you total all the die faces and score that total. For 4 of a kind, you must have at least four of the same die faces. Again, you total all the die faces and score that total.

Straights: Like in poker, a straight is a sequence of consecutive die faces. A small straight is 4 consecutive faces, and a large straight is 5 consecutive faces. Small straights score 30 points and large straights score 40 points.

Full House: Again as in poker, a full house is a roll where you have both a three of a kind and a pair. Full houses score 25 points.

Yahtzee: A Yahtzee is a 5 of a kind (all die faces are the same), and it scores 50 points.

Chance: Chance is the catch-all roll. You can roll anything and you simply total all of the die face values.

Assignment:

Download the **Yahtzee.zip** file and unzip. It will create the directory “**Yahtzee**” and do all of your work in that directory. There will be six files. **Dice.java** and **YahtzeePlayer.java** are complete files and should not be changed. **DiceGroup.java** requires your work on sections marked “you complete”. **YahtzeeScoreCard.java** requires you to add all of the scoring for the different categories. **Yahtzee.java** is where you write the overall game. **Yahtzee.jar** has a working example of the game and can be executed by:

```
% java -cp Yahtzee.jar Yahtzee
```

A partial sample run:

```
% java Yahtzee
```

```
+-----+
| WELCOME TO MONTA VISTA YAHTZEE!
|
| There are 13 rounds in a game of Yahtzee. In each turn, a player can roll his/her
| dice up to 3 times in order to get the desired combination. On the first roll, the
| player rolls all five of the dice at once. On the second and third rolls, the
| player can roll any number of dice he/she wants to, including none or all of them,
| trying to get a good combination.
| The player can choose whether he/she wants to roll once, twice or three times in
| each turn. After the three rolls in a turn, the player must put his/her score down
| on the scorecard, under any one of the thirteen categories. The score that the
| player finally gets for that turn depends on the category/box that he/she chooses
| and the combination that he/she got by rolling the dice. But once a box is chosen
| on the score card, it can't be chosen again.
|
| LET'S PLAY SOME YAHTZEE!
+-----+
```

Player 1, please enter your first name : **One**

Player 2, please enter your first name : **Two**

Let's see who will go first. One, please hit enter to roll the dice :

```
  # 1          # 2          # 3          # 4          # 5
+-----+ +-----+ +-----+ +-----+ +-----+
| 0 0 | |   0 | |   0 | |   0 | | 0 0 |
|  0 | |   | |   | |   | |  0 |
| 0 0 | | 0 | | 0 | | 0 | | 0 0 |
+-----+ +-----+ +-----+ +-----+ +-----+
```

Two, it's your turn. Please hit enter to roll the dice :

```
  # 1          # 2          # 3          # 4          # 5
+-----+ +-----+ +-----+ +-----+ +-----+
|  0 | | 0 0 | | 0 0 | | 0 0 | |  0 |
|  0 | |  0 | |  0 | |  0 | |   |
|  0 | | 0 0 | | 0 0 | | 0 0 | |   |
+-----+ +-----+ +-----+ +-----+ +-----+
```

Whoops, we have a tie (both rolled 17). Looks like we'll have to try that again . . .

Let's see who will go first. One, please hit enter to roll the dice :

# 1	# 2	# 3	# 4	# 5
<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>

Two, it's your turn. Please hit enter to roll the dice :

# 1	# 2	# 3	# 4	# 5
<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>

One, you rolled a sum of 14, and Two, you rolled a sum of 17.
Two, since your sum was higher, you'll roll first.

NAME	1	2	3	4	5	6	3of Knd	4of Knd	Fll Hse	Sml1 Strt	Lrg Strt	Chnc	Ytz!
One													
Two													

Round 1 of 13 rounds.

Two, it's your turn to play. Please hit enter to roll the dice :

# 1	# 2	# 3	# 4	# 5
<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>	<div style="display: flex; justify-content: space-around; align-items: center; height: 60px;"> ○ ○ </div>

Which di(c)e would you like to keep? Enter the values you'd like to 'hold' without spaces. For examples, if you'd like to 'hold' die 1, 2, and 5, enter 125 (enter -1 if you'd like to end the turn) : **-1**

NAME	1	2	3	4	5	6	7	8	9	10	11	12	13
One													
Two													

Two, now you need to make a choice. Pick a valid integer from the list above : **11**

NAME	1	2	3	4	5	6	3of Knd	4of Knd	Fll Hse	Sml1 Strt	Lrg Strt	Chnc	Ytz!
One													
Two											40		

One, it's your turn to play. Please hit enter to roll the dice :

# 1	# 2	# 3	# 4	# 5																						
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Which di(c)e would you like to keep? Enter the values you'd like to 'hold' without spaces. For examples, if you'd like to 'hold' die 1, 2, and 5, enter 125 (enter -1 if you'd like to end the turn) : **123**

# 1	# 2	# 3	# 4	# 5																								
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Which di(c)e would you like to keep? Enter the values you'd like to 'hold' without spaces. For examples, if you'd like to 'hold' die 1, 2, and 5, enter 125 (enter -1 if you'd like to end the turn) : **125**

# 1	# 2	# 3	# 4	# 5																						
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NAME	1	2	3	4	5	6	3of Knd	4of Knd	F11 Hse	Sml1 Strt	Lrg Strt	Chnc	Ytz!
One													
Two											40		

One, now you need to make a choice. Pick a valid integer from the list above : **4**

NAME	1	2	3	4	5	6	3of Knd	4of Knd	F11 Hse	Sml1 Strt	Lrg Strt	Chnc	Ytz!
One				8									
Two											40		

Round 2 of 13 rounds.

Two, it's your turn to play. Please hit enter to roll the dice :