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Yahtzee is a dice game that was originally made by the Milton Bradley Company.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 Knd		Fll Smll Hse Strt	-	Chnc	Ytz!
	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:

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-	0		0		0	0	0	0	<u> </u>	0	0
l	0		0		0	0	0	0		0	0
_											

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 five 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.

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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 -> Aaron Player 2, please enter your first name -> Betty Let's see who will go first. Aaron, please hit enter to roll the dice -> # 1 # 2 # 3 # 5 0 0 0 0 0 1 1 0 0 0 0 0 0 1 0 \cap 10 1 0 Betty, it's your turn. Please hit enter to roll the dice -> # 1 # 2 # 3 # 4 # 5 0 | 0 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0

Aaron, you rolled a sum of 16, and Betty, you rolled a sum of 17.

Betty, since your sum was higher, you'll roll first.

3of 4of Fll Smll Lrg 6 Knd Knd Hse Strt Strt Chnc Ytz! NAME | Betty Round 1 of 13 rounds. Betty, it's your turn to play. Please hit enter to roll the dice -> # 1 # 2 # 3 # 4 0 | 0 | 0 0 1 1 0 Ο 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) -> 1234 # 2 $0 \mid$ 0 0 0 0 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) -> 1234 # 3 # 1 # 2 # 4 # 5 0 0 0 \cap 1 0 \cap 1 0 1 0 3of 4of Fll Smll Lrg 1 2 3 4 5 6 Knd Knd Hse Strt Strt Chnc Ytz! | Betty 4 5 7 8 9 10 11 12 13 Betty, now you need to make a choice. Pick a valid integer from the list above (1 - 13) -> 4 3of 4of Fll Smll Lrg 1 2 3 4 5 6 Knd Knd Hse Strt Strt Chnc Ytz! NAME l Aaron Aaron, it's your turn to play. Please hit enter to roll the dice -> # 1 # 3

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NAME	1	2	3	4	!	5	6				Smll Strt	_	Chnc	c Ytz!
Aaron			 							 				
Betty +			 	8						l 	 			 +
Aaron, now you	1 need t	2 o mal	3 ke a	4 choi		5 Pick	6 : a	7 valid	8	9 ger f	10 rom t	11 he li	12 .st ak	13 pove (1 -
NAME	1	2	3	4	!	5	6	3of Knd			Smll Strt	_	Chnc	: Ytz!
+ Aaron +	2 		 	 	 			 		 	 	 	 	+ +
Betty			 	8	 					 				
+														
Round 2 of 13 1	rounds.													
Round 2 of 13 m Betty, it's you	ur turn		play.			hit			roll			->		
Round 2 of 13 1			play.	Plea # 3		hit		er to # 4	roll		dice 5	->		
Round 2 of 13 m Betty, it's you	ur turn # 2		I	# 3		hit	-	# 4 O O	- 		5			

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spaces. For e	rould you like to keep? Enter the values you'd like to 'hold' without xamples, if you'd like to 'hold' die 1, 2, and 5, enter 125 ou'd like to end the turn) -> 23
# 1	# 2 # 3 # 4 # 5
NAME	3of 4of Fll Smll Lrg 1 2 3 4 5 6 Knd Knd Hse Strt Strt Chnc Ytz!
Aaron 	2
Betty +	
Betty, now you	1 2 3 4 5 6 7 8 9 10 11 12 13 need to make a choice. Pick a valid integer from the list above $(1 - 13)$ 3 of 4 of Fll Smll Lrg
NAME +	1 2 3 4 5 6 Knd Knd Hse Strt Strt Chnc Ytz!
Aaron +	2
Betty + Baron it's vo	ur turn to play. Please hit enter to roll the dice ->
# 1	# 2 # 3 # 4 # 5
spaces. For e	rould you like to keep? Enter the values you'd like to 'hold' without xamples, if you'd like to 'hold' die 1, 2, and 5, enter 125 ou'd like to end the turn) -> 23
# 1	# 2 # 3 # 4 # 5
spaces. For e	rould you like to keep? Enter the values you'd like to 'hold' without xamples, if you'd like to 'hold' die 1, 2, and 5, enter 125 ou'd like to end the turn) -> 24
	# 2 # 3 # 4 # 5

Aaron, now you need to make a choice. Fick a valid integer from the list above (1 - 13) -> 9

NAME	 	1	2		3	4	5	i 	6		4of Knd			_	Chnc	Ytz!	_
Aaron	 	2		1	1		1	1				25				1	
Betty	 		 	 		8				20		 					+ +

Round 3 of 13 rounds.

Betty, it's your turn to play. Please hit enter to roll the dice ->

# 1		# 2		# 3	3	#	4	# 5			
		1		1							
10	0		0		0	1					
10	0		1	C)	1	0	0			
10	0	1 0		10		1					
l	I		[l		1		lI			

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) -> 234

# 1		# 2		#	# 3	#	4		# 5			
								-				
	0		0		0			1				
					0		0			0		
10		10		() (
1	I	1	I	1	I	1		_1	1	I		

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) -> 1245

# 1	# 2	# 3	# 4	# 5			
	1			0			

NAME		1	2	3	4			K	nd	Knd	Hse		Lrg Strt		
Aaron		2				1	1	1		I	25	1		1	i i
Betty															
T		1	2	3	4	5	6		7	8	9	10	11	12	13

Betty, now you need to make a choice. Pick a valid integer from the list above $(1 - 13) \rightarrow 2$

NAME	1 2	3 4 5	6 Knd Knd	Fll Smll Lrg	Chnc Ytz!
Aaron	2				
Betty	4	8	20		
# 1	your turn to	play. Please hit	enter to roll	l the dice -> # 5	
	0		0 0		
0 	0	0	0 0 	0	

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) -> 15

# 1	# 1		2	#	3	#	4	# 5		
		1		1						
	0		0		0		0		0	
	1		1		0				0	
10	1	1 0	1	10	1	10		1 0		
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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) -> -1

_	NAME		1	2	3	3	4					F	Knd	Kn	ıd	Hse		Lrg Strt	-		_
	Aaron	ı	2	I				1				I		1		25	I		1	1	T -
	Betty	ı		4																	T -
Т			1	2		3	4		5		6		7	8	3	9	10	11	12	13	т

Aaron, now you need to make a choice. Pick a valid integer from the list above $(1 - 13) \rightarrow 7$

NAME		1		2	3	3	4		5	6				Smll Strt	Lrg Strt	Chnc	Ytz!	
Aaron	ı	2	1		1	ı		ı	1		12	l	25	1			1	
Betty				4			8	1			20	 	 					

Round 4 of 13 rounds.

Betty, it's your turn to play. Please hit enter to roll the dice ->

# 1		# 2	# 3	# 4	# 5
	0	0	0 0	0	0 0 1
		0	0 0	0	1 1
10		0	0 0 1	0	0 0
1		ll	lI	ll	11

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
	amples, if you	'd like to 'ho	ld' die 1, 2, 8	u'd like to 'hold' without and 5, enter 125
# 1	# 2	# 3	# 4	# 5
NAME +	1 2 3	4 5 6		'll Smll Lrg Hse Strt Strt Chnc Ytz!
Aaron +	2		12 :	25
Betty +	4	8	20	
	1 2 3	4 5	6 7 8	9 10 11 12 13
Betty, now you n	need to make a	choice. Pick		r from the list above (1 - 13) -> 10 "Il Smll Lrg
NAME	1 2 3		3of 4of F 5 Knd Knd F	Tll Smll Lrg Hse Strt Strt Chnc Ytz!
NAME + Aaron +	1 2 3	4 5 6	3of 4of F 5 Knd Knd F 12 1	Tll Smll Lrg Hse Strt Strt Chnc Ytz!+ 25
NAME +	1 2 3	4 5 6	3of 4of F 5 Knd Knd F	Tll Smll Lrg Hse Strt Strt Chnc Ytz!
NAME + Aaron +	1 2 3	4 5 6	3of 4of F 5 Knd Knd F 12 ::	Tll Smll Lrg Hse Strt Strt Chnc Ytz!+ 25
NAME +	1 2 3	4 5 6	3of 4of F 5 Knd Knd F 12 ::	Tll Smll Lrg Hse Strt Strt Chnc Ytz!+ 25
NAME +	1 2 3 2 4 turn to play	4 5 6	30f 40f F 5 Knd Knd F 12 ::	Til Smll Lrg Hse Strt Strt Chnc Ytz!
NAME +	1 2 3 2 4 turn to play # 2 0 0 0 0 uld you like to the amples, if you	4 5 6	30f 40f F 5 Knd Knd F 12 12 14 4 1 1 1 1 1 1	# 5 # 5 # 0 0
NAME +	1 2 3 2 4 turn to play # 2 0 0 0 0 uld you like to the amples, if you	4 5 6	30f 40f F 5 Knd Knd F 12 12 14 4 1 1 1 1 1 1	# 5 # 0 0 0 0 1 0
NAME +	1 2 3 2 4 turn to play # 2 0 0 0 0 uld you like to end	4 5 6	30f 40f F 5 Knd Knd F 12 12 14 4 1 1 1 1 1 1 1 1	# 5 # 5 # 0 0 0 0 0 0 u'd like to 'hold' without and 5, enter 125

1 # 2 # 3 # 4 # 5 |-----|

0	0 0	
NAME	1 2	3 of 4 of Fll Smll Lrg 3 4 5 6 Knd Knd Hse Strt Strt Chnc Ytz!
Aaron 	2	
' Betty +	4	8 20 30
•	1 2	3 4 5 6 7 8 9 10 11 12 13
Aaron, now yo	u need to make	a choice. Pick a valid integer from the list above (1 - 1
NAME	1 2	3 of 4 of Fll Smll Lrg 3 4 5 6 Knd Knd Hse Strt Strt Chnc Ytz!
+ Aaron		10 12 25
+ Betty		8 20 30
0 0	0	
0 0	0	to keep? Enter the values you'd like to 'hold' without ou'd like to 'hold' die 1, 2, and 5, enter 125
0 0	0	0
0 0	would you like examples, if yo you'd like to e	to keep? Enter the values you'd like to 'hold' without ou'd like to 'hold' die 1, 2, and 5, enter 125 end the turn) -> 245 # 3 # 4 # 5
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Which di(c)e spaces. For (enter -1 if # 1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 1 0	would you like examples, if yo you'd like to e # 2 O O O O Would you like examples, if yo you'd like to e	to keep? Enter the values you'd like to 'hold' without ou'd like to 'hold' die 1, 2, and 5, enter 125 end the turn) -> 245 # 3 # 4 # 5 0 0 0 0 0 0 0 0 0
Which di(c)e spaces. For (enter -1 if # 1 0 0 0 0 0 0 0 0 0 1 Which di(c)e spaces. For (enter -1 if # 1 # 1 1 1 1 1	would you like examples, if yo you'd like to e # 2	to keep? Enter the values you'd like to 'hold' without ou'd like to 'hold' die 1, 2, and 5, enter 125 end the turn) -> 245 # 3 # 4 # 5 0 0 0 0 0 0 1 0 0 1 0 1 0 2 4 5 4 5 5 6 6 7 6 7 7 7 8 8 8 9 7 8 8 9 8 9 9 9 9 9 9 9 10 10 10 10 10 10 10 10

	1	2	3	4	5	6	7	8	9	10	11	12	13
ty, now you	need to	o make	a ch	oice	. Pic	k a '	valid	integ	er f	rom t	he li	st ab	ove (1
NAME	1	2	3	4	5	6	3of Knd			Smll Strt	Lrg Strt	Chnc	Ytzl
 Aaron	 2	 I	 		10				25			 	+
Betty	l I	4	 	8	 		20			30	 	 	+
								11					+
ron, it's yo # 1	ur turn # 2	to pl	_	·leas	e hit		er to	roll		dice 5	->		
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NAME	1						Knd	Knd	Hse	Strt		Chnc	Ytz! +
NAME	2				10		Knd 12	Knd 	Hse	Strt		Chnc	Ytz! +
NAME Aaron Betty	2	 		8	10		Knd 12 20	Knd	Hse 25	Strt 30	Strt 	 	+ +
NAME Aaron 	2	4	3	8	10	 6	Knd 12 20 	Knd	Hse 25 9	Strt 30 10	Strt 	 	+
NAME Aaron 	2	4	3	8	10	 6	Knd 12 20 	Knd	Hse 25 9	Strt 30 10	Strt 	 	+
NAME Aaron Betty aron, now you	2 1	4 2 make	3	8 4	10 	 6 k a	12 20 7 7 7 7 3 3 5 6 6 6 6 6 6 6 6 6	Knd 9 8 integ	Hse 25 9 9 F11	Strt	Strt 11 che li	 12 st ab	+
NAME Aaron Betty con, now you	2 1 1 need to	4 2	3 3	8 4 doice	10 5	6 6	Knd 12 20 7 valid 3of Knd	Knd 9 8 integ	Hse 25 9 ger f	30	Strt 11 che li	 12 st ab	+

Round 6 of 13 rounds.

(Towards the end of the game)

Aaron, it's your turn to play. Please hit enter to roll the dice ->

# 1	#	2	# 3	3	# 4	Į.	# 5
0) 0	0	0	0	1		0
			0	0	0)	
0	0	0	0	0	1		0
l	II				1	I	l

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) -> 15

# 1			2	# :	3	# 4		# 5
				1		1	-	
	0		1		0	100		0
			0			1 0		
10			1	1 0		100		0
1	I	I	1	1		1	_	lI

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) -> 135

# 1	-	# 2	2	# :	3	# 4	# 5
		1				1	
	0	10	0		0	100	0
	1	10	0	1		1 0	
10	1	10	0	10		100	0
1		1	1	1		I	1

NAME		1		2		3		4	5	6		4of Knd						_	. (Chnc	Y	tz!
Aaron	ı	2		4			I					22		25	I	30	I	0		18	I	
Betty		4		4	1	6	1					9		25		30		0	I	19	Ī	
+		1		2		3		4	5	 6	 7	 8	_	9		10		11		12		13

Aaron, now you need to make a choice. Pick a valid integer from the list above $(1 - 13) \rightarrow 13$

	NAME		1		2		3		4		5		6				4of Knd					_	C	hnc	Υt	z!	_
	Aaron	1	2		4	I			4	I	10	1	18	I	12	١	22	25		30	١	0	1	18		0	
	Betty	I	4	1	4	1	6	I	8	I	10	1	0	Ι	20	1	9	25	-	30	1	0	I	19			T

Round 13 of 13 rounds.

Betty, it's your turn to play. Please hit enter to roll the dice ->

# 1	# 2	# 3	# 4	# 5

1	1				1			1	
	0		0	0	0			0	
				10	0	()	0	
10		0	1	1 0	0			0	
l	I	l		l		I		ll	
spaces	. For	exampl	es, if		ke to	'hold'		you'd like , and 5, en	

to 'hold' without er 125

# 1		# :	2	# 3	3	# 4	1	#	5
		1		1		1			
	0	1	0		0	10	0		1
		1				10	0		0
10		10		10		10	0		1
		1		1		1		1	I

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	1	#	2	# 3	3	# 4	4	# 5	i
1		1							
	0	1	0	1	0	0	0	0	0
						()		
10		1 0		1 0		0	0	0	0
l		1							

NAME		1	2	3	4	5			Knd			_	Chnc	Ytz!
Aaron		2	4	I			18	12	22	25	30	0	18	0
Betty		4	4	6		10					30	0	19	
+		1	2	3	 4	5 5	6	 7	8	9	10	11	12	13

Betty, now you need to make a choice. Pick a valid integer from the list above (1 - 13) -> 13

NAME		1		2		3		4	5	6				Smll Strt	_	С	hnc	Y	tz!	
Aaron		2		4			1							30 						
Betty		4		4		6	1							30						

Aaron, it's your turn to play. Please hit enter to roll the dice ->

# 1	# 2	# 3	# 4	# 5
				l

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	# 1 # 2				# 3	# 4	# 5			
				_		1			—	
(1			0 0				0	
1 0	1	1	0		0	1 0				
1 0		- 1			0 0	1		1 0		

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

# 1	# 2	# 3	# 4	# 5
0 1	0 0 1	i i	i i	1001
0	0	0	0	0
0	0 0			0 0
11	11	l1	l1	11

Aaron, now you need to make a choice. Pick a valid integer from the list above $(1 - 13) \rightarrow 5$ Aaron, now you need to make a choice. Pick a valid integer from the list above $(1 - 13) \rightarrow 3$

NAME		1	2	3				3of Knd	Knd		Strt	Strt	-	
Aaron		2	4	3										0
Betty	l	4	4	6	8	10	0	20	9	25	30	0	19	0

Aaron score total = 148 Betty score total = 135

Congratulations Aaron. YOU WON!!!