Programming Assignment 5: Yahtzee

In this assignment, we want to practice working with “class” by implementing Yahtzee. Yahtzee is a dice and board game that is played with two players but here we only implement it for a solo player.

You can read the rules of the game (and maybe play with it a little) here.

The only difference is that we are not going to implement yahtzee bonus: we can play yahtzee only **once**, similar to other rows in the board.

The user rolls the dice three times. The first time the user rolls all 5 dice (we are going to show the first draw directly to the user without an explicit request).

```
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               -
6.  Sixes:               -
    Sum:                 0
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      -
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   0
Hand: 3 5 1 4 5
Keep Dice (s to stop rolling):
```

The first roll is 3, 5, 1, 4, and 5. Now we are prompted to keep any dice that we want and roll the rest. Here we have two fives so we are going to keep them and roll the rest. Note that we enter our selection using a string of dice numbers from left to right.
For the user the leftmost dice is number 1 and rightmost one is 5. In the program we are going to translate these dice numbers to indices that are started from 0. (Same is true for the board rows. For example, the second row has an index of one in the program.)
We are going to keep fives, so we enter “25”:

```
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               -
6.  Sixes:               -
    Sum:                 0
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      -
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   0
Hand: 3 5 1 4 5
Keep Dice (s to stop rolling): 25
Hand: 6 5 2 4 5
Keep Dice (s to stop rolling):
```

We weren't lucky however, we have another chance. Let's keep 2 and 5 again and roll:

```
Hand: 6 5 2 4 5
Keep Dice (s to stop rolling): 25
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               -
6.  Sixes:               -
    Sum:                 0
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      -
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   0
Hand: 6 5 2 5 5
Select a combination to play:
```

Yaay! We got one more five. Ok since we have completed all of our rolls, we are prompted to select one of the board rows. We have an option to play any rows, but would get points by playing one of “Three of a kind”, “Chance”, or “Fives”. I myself prefer to go for a bonus so I play “Fives”.

```
Select a combination to play: 5
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               15
6.  Sixes:               -
    Sum:                 15
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      -
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   15
Hand: 6 6 3 4 5
Keep Dice (s to stop rolling):
```

Ok got 15 points for “Fives” and need 48 more points in the upper board to get the bonus!
After playing the combination the result of our next roll has been shown: 6, 6, 3, 4, 5.
Here I am going to stop rolling and play the combination (although it is not a good play, when you have small straight, you can go for the large one).
Here I am going to stop rolling and play ”Small straight”:

```
Keep Dice (s to stop rolling): s
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               15
6.  Sixes:               -
    Sum:                 15
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      -
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   15
Hand: 6 6 3 4 5
Select a combination to play: 10
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               15
6.  Sixes:               -
    Sum:                 15
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      30
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   45
Hand: 4 5 5 3 3
Keep Dice (s to stop rolling):
```

Ok, we have to continue playing until we play all rows. We cannot play a row twice, but we can play any row that has not been played yet:

```
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               15
6.  Sixes:               -
    Sum:                 15
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      30
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   45
Hand: 4 5 5 3 3
Keep Dice (s to stop rolling): s
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               15
6.  Sixes:               -
    Sum:                 15
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      30
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             -
Total:                   45
Hand: 4 5 5 3 3
Select a combination to play: 5
This combination has been played. Select another one: 13
1.  Ones:                -
2.  Twos:                -
3.  Threes:              -
4.  Fours:               -
5.  Fives:               15
6.  Sixes:               -
    Sum:                 15
    Bonus:               0
7.  Three of a kind:     -
8.  Four of a kind:      -
9.  Full house:          -
10. Small straight:      30
11. Large straight:      -
12. Chance:              -
13. Yahtzee:             0
Total:                   45
```

Notes:

1) The way that you present your board is not important. The autograder only checks the values of the board directly using the corresponding class methods.
2) Carefully read the starter code instructions.
3) Do not change class names and the signature of their existing methods in the starter code.
4) You can add any new class member as you wish.
5) For these types of programs, it is very difficult to find the bugs in the programs by just running them, as you may not face some combinations at all. You must create test cases for your code to check possible combinations and find errors. A sample of the test case has been provided and you can call it in your main function instead of the run function (autograder uses similar test cases for different functionalities of your code).