Homework 2

This homework is to help you practice with arrays in Java
- We will **not grade your coding style** but you should **make your code as readable as possible**
- You **are not encouraged** to use AI tools to write the code in this homework

Question   (Poker hand): In poker, players form sets of five playing cards, called hands, according to the rules of the game. Each hand has a rank, which is compared against the ranks of other hands participating in the showdown to decide who wins the pot
https://en.wikipedia.org/wiki/List_of_poker_hands

Specification: Your task is to implement a class named "Poker_hand_hw2" to rank and compare poker hands. This class has
1. A constructor that gets an array of 5 strings representing 5 cards. In each string, the last character represents the suit (H: Heart, D: Diamond, C: Club, S: Spade) and the preceding characters represent the card rank (2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K, A). An IllegalArgumentException is thrown in the case the input is not in this format.
2. A method "get_category" that has no parameters and returns an integer representing the category of this hand (9: straight flush, 8: four of a kind, 7: full house, …, 1: high card), we do not have "Five of a kind" in our settings.
3. A method "compare_to" that gets another hand (i.e. an object of Poker_hand_hw2 class) as a parameter and returns an integer which is either -1, 0, or 1 if this hand is ranked lower, equal, or higher than the other hand respectively.

Sample test cases:

```
// IllegalArgumentException is thrown since the input has only 4 cards
String[] cards = {"2H", "4C", "10S", "AS"};
Poker_hand_hw2 sample_hand = new Poker_hand_hw2(cards);

// IllegalArgumentException is thrown since the input has an unknown card "1H"
String[] cards = {"1H", "4C", "2H", "10S", "AS"};
Poker_hand_hw2 sample_hand = new Poker_hand_hw2(cards);

// Full house
String[] cards = {"4H", "4C", "10H", "10D", "4S"};
Poker_hand_hw2 sample_hand = new Poker_hand_hw2(cards);
System.out.println(sample_hand.get_category()); //7

// One pair
String[] cards = {"AH", "4C", "10H", "8D", "AS"};
Poker_hand_hw2 sample_hand = new Poker_hand_hw2(cards);
System.out.println(sample_hand.get_category()); //2
```

```
// Hand_1 > Hand_2 since Full house > Flush
String[] cards = {"4H", "4C", "8S", "8D", "4S"};
Poker_hand_hw2 hand_1 = new Poker_hand_hw2(cards);
String[] another_cards = {"AH", "4H", "10H", "8H", "JH"};
Poker_hand_hw2 hand_2 = new Poker_hand_hw2(another_cards);
System.out.println(hand_1.compare_to(hand_2)); //1

// Hand_1 < Hand_2 since both have two pairs but the second pair of hand_2 is larger
String[] cards = {"KH", "KC", "8H", "8D", "JS"};
Poker_hand_hw2 hand_1 = new Poker_hand_hw2(cards);
String[] another_cards = {"10S", "KS", "10H", "KD", "4H"};
Poker_hand_hw2 hand_2 = new Poker_hand_hw2(another_cards);
System.out.println(hand_1.compare_to(hand_2)); //-1

// Hand_1 = Hand_2 since both are straight with the same highest card
String[] cards = {"JH", "QC", "8H", "9D", "10S"};
Poker_hand_hw2 hand_1 = new Poker_hand_hw2(cards);
String[] another_cards = {"8S", "10H", "QH", "9H", "JS"}
Poker_hand_hw2 hand_2 = new Poker_hand_hw2(another_cards);
System.out.println(hand_1.compare_to(hand_2)); //0
```

Implementation & submission:
1. Create a file **"Poker_hand_hw2.java"** and add the line
   "package com.gradescope.cs201;"
   at the beginning (otherwise Gradescope can not find your class).
2. Add your code into this file and submit it to Homework 2 on the GradeScope to test your solution.