CSE2011 Problem Solving, 2016 Spring

Instructor: Jinkyu Lee

Homework 2 (100 points): 2015/3/17

Due date: 2015/3/28 23:59 (submission to icampus)

Problem 2-1: Finding K Test Program

- Recall Homework 1 – Finding K. You are going to make test cases for the problem.
- Input: X, Y, n, D1, D2, …, Dn
  - [X,Y] is a range for each element; X and Y are positive integers.
  - n is the size of matrix (n by n).
  - D1, D2, …, Dn are diagonal entries.
- Output: n*n matrix, each of whose column and row is sorted in an ascending order. Also, each element should be a unique integer value. If such a matrix is not feasible, print "infeasible"
- This problem is inspired by the question from 김영훈, and designed by Prof. Jinkyu Lee and TA. Namyong Jung.

- Sample Result

```
What is X and Y? 5 50
What is n? 4
What are Ds? 20 21 22 23
   5 10 15 23
   6 11 22 35
   7 21 30 45
20 25 40 50
```

```
What is X and Y? 5 25
What is n? 4
What are Ds? 20 21 22 23
Infeasible!
```

In your code

- You need to implement test_cases() function; do not modify main(). You are allowed to modify contents marked. You may add additional functions within the marked part.
- TA will copy your code "from here" "to here" to the template code; other parts will not be evaluated.
- Insert comments to contents you created or modified.
- TA will test your program in

  http://ideone.com/

In your report

- Explain your solution idea (algorithm) and code.

Problem 2-2: Foker Hands

- A Foker deck contains 32 cards. Each card has a suit of either clubs, diamonds, hearts, or spades (denoted C, D, H, S in the input data). Each card also has a value of either 2 through 9 (denoted 2, 3, 4, 5, 6, 7, 8, 9). For scoring purposes card values are ordered as above, with 2 having the lowest and 9 the highest value. The suit has no impact on value.
- A Foker hand consists of three cards dealt from the deck. Foker hands are ranked by the following partial order from lowest to highest.
    - High Card. Hands which do not fit any higher category are ranked by the value of their highest card. If the highest cards have the same value, the hands are ranked by the next highest, and so on. (Suits do not affect the rank.)
    - Pair. Two of the three cards in the hand have the same value. Hands which both contain a pair are ranked by the value of the cards forming the pair. If these values are the same, the hands are ranked by the values of the cards not forming the pair, in decreasing order.
    - Three of a Kind. All the three cards in the hand have the same value. Hands which both contain three of a kind are ranked by the value of the three cards.
    - Flush. Hand contains three cards of the same suit. Hands which are both flushes are ranked using the rules for High Card.
    - *Straight.* Hand contains three cards with consecutive values. Hands which both contain a straight are ranked by their highest card.
    - *Straight Flush.* Three cards of the same suit with consecutive values. Ranked by the highest card in the hand.

- Your job is to compare several pairs of Foker hands and to indicate which, if either, has a higher rank. Each player has three cards, but each player can change the value of one card (to any value) so as to make the player's Foker hand as high as possible.
- Input: The input file contains several lines, each containing the designation of six cards: the first three cards are the hand for the player named "Black" and the next three cards are the hand for the player named "White".
- Output: For each line of input, print a line containing one of the following:

  Tie.

  Black wins.

  White wins.
- Sample Result

2C 4D 4H 2H 4S 4C
Tie.
5H 6H 7D 6H 6C 5S
Black wins.
9D 5C 9H 8H 9D 8C
White wins.

Why such output?
Tie. (4C 4D 4H = 4H 4S 4C)
Black wins. (8H 6H 7D > 7H 6C 5S)
White wins. (9D 9C 9H < 7H 9D 8C)

In your code

- You need to implement Foker_hands() function; do not modify main(). You are allowed to modify contents marked. You may add additional functions within the marked part.
- TA will copy your code "from here" "to here" to the template code; other parts will not be evaluated.
- Insert comments to contents you created or modified.
- TA will test your program in http://ideone.com/

In your report

- Explain your solution idea (algorithm) and code.