EE2310 Introduction to Programming – Assignment 1
Due: April 1st, 2015 (11:59pm)

Instructions

1. Your program should be compilable with Dev C++ and executable on a PC running Windows platform.

2. Submit your **source file (.c file)** on the iLMS system: http://lms.nthu.edu.tw/ Your source code and program summary should contain your name and student ID at the beginning.

3. Late submission will incur 10% penalty per day up to 3 days. After that, assignment submission will be closed and no submissions will be accepted.

Task Description

A playing card deck contains 52 cards. Each card has one suit (either clubs, diamonds, hearts or spades) and one card number (Pip cards: 1~10 in which '1' is called "ace". Face cards: Jack, Queen, and King). This assignment is based on a common card game in Taiwan called "十三張". A hand consists of five cards dealt from the deck. Cards are ranked first by their values then by their suits. Suits are ranked as Spade > Heart > Diamond > Club. Hands are ranked by their patterns as follows (from the largest to the smallest).

1. *Straight Flush* (同花順). Five cards of the same suit with consecutive values. ranked by the highest card in the hand. Note that "**10 J Q K A**" is considered the largest straight and "**2 3 4 5 6**" is considered the smallest. "**A 2 3 4 5**" is NOT considered a straight.

2. *Bomb* (鐵支). Four cards with the same number. ranked by the value of the four cards.

3. *Full House* (葫蘆). Three cards of the same value, with the remaining two cards forming a pair. Ranked by the value of the three cards.

4. *Flush* (同花). Hand contains five cards of the same suit. Hands which are both flushes are ranked by their largest card.

5. *Straight* (順子). This type of hand contains five cards with consecutive values. Hands which both contain straight are ranked by their highest card.

6. *Triplet* (三條). Three of the 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.

7. *Two Pairs* (兩對). This type of hand contains two different pairs. Hands which both contain two pairs are ranked by the value of their highest pair. Hands with the same highest pair are ranked by the high suits of the highest pairs.

8. *Pair* (對子). Two of the five 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. Hands with the same value of pair are ranked by the high suits of the pairs.

9. *High card* (胡亂). Hands which do not fit any category are ranked by the value of their highest card. if the highest cards have the same value, the hands are ranked by their suits.

What you need to do?

Write a program that determines the highest pattern of a (card) hand. In your input, the suits are represented by the characters S, H, D, C (for spade, heart, diamond, and club). The values are represented by 2~9, T (representing 10), J, Q, K, and A. Your program should output the sorted pattern according to the following rules.

1. For straight flush, flush, straight, and high card, your output should be sorted in **ascending order**. You should also output the highest card.

Sample input 1 (output is shown in **red**):

```
CT CK CJ CA CQ
CA-straight flush
C10 CJ CQ CK CA
```

Note that you should output '10' instead of 'T'. 'T' is used for input only.

2. For four of a kind, you should output the single card first, followed by the sorted four of a kind. You should also output the value of the four of a kind.

Sample input 2 (output is shown in **red**):

```
D2 ST S2 H2 C2
2-four of a kind
S10 C2 D2 H2 S2
```

3. For full house, you should first output the sorted pair, followed by the sorted three of a kind. You should also output the value of the three of a kind.

Sample input 3 (output is shown in **red**):

```
D7 SJ H7 HJ C7
7-full house
HJ SJ C7 D7 H7
```

4. For two pairs, you should first output the single card, followed by the sorted smaller pair and the sorted larger pair. You should also output the highest card of the highest pair.

Sample input 4 (output is shown in **red**):

```
D5 H5 SA HA CQ
SA-two pairs
CQ D5 H5 HA SA
```

5. For three of a kind, you should output the (sorted) two single cards not in the 'three of a kind', followed by the sorted three of a kind. You should also output the value of the three of a kind.

Sample input 5 (output is shown in **red**):

```
D9 SQ H9 H3 C9
9-three of a kind
H3 SQ C9 D9 H9
```

6. For pair, you should output the (sorted) three single cards not in forming the pair, followed by the sorted pair. You should also output the highest card of the pair.

Sample input 6 (output is shown in **red**):

```
D5 H5 SA HK CQ
H5-pair
CQ HK SA D5 H5
```

Guidelines

1. Mark weightings: Correctness 70%, Source code readability 30%.
2. Correctness:
   Make sure you understand what the program should do in every case
   (including special cases).
3. Program Style:
   a. Your program should include a number of functions. Their functionality
   should be well-defined, easily understandable, and clearly documented as
   comments within the source code.
   b. Do not use any global variable to pass data in and out of a function.
   c. Do not use any "goto" statement.
   d. Add sufficient (but not excessive) comment to your program.
   e. The efficiency of your program should be reasonable. However, don't spend
   too much time just to speed it up while making the code difficult to read.