Problem 9: Cribbage Scores

Source filename:	`cribbage.cpp`
Input filename:	`cribbage.in`
Output filename:	`cribbage.out`

The goal of this problem is to calculate the points in a Cribbage hand.

Detailed Problem Description

Cribbage is a card game played by two players and uses a standard deck of cards. For those unfamiliar, a standard deck of cards has 4 suits (hearts, diamonds, clubs, and spades) and each suit contains 13 cards with face values: ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, jack, queen, and king. For this problem a 2 character code will be used to designate a card. The first character designates the face values and will be one of the following: `A,2,3,4,5,6,7,8,9,T,J,Q,K`. The character 'A' represents an ace and corresponds to a face value of 1. The character 'T' represents a 10 card (and obviously has a face value of 10). The character 'J' represents a jack . The character 'Q' represents a queen. The character 'K' represents a king.

The second character designates a suit and will be one of the following: `H,D,C,S` (for hearts, diamonds, clubs & spades).

Since there are 13 distinct face values that occur in each of 4 suits, the complete set of 52 cards = {`AH 2H 3H 4H 5H 6H 7H 8H 9H TH JH QH KH AD 2D 3D 4D 5D 6D 7D 8D 9D TD JD QD KD AC 2C 3C 4C 5C 6C 7C 8C 9C TC JC QC KC AS 2S 3S 4S 5S 6S 7S 8S 9S TS JS QS KS`}.

A Cribbage hand consists of 5 distinct cards taken from these 52 possibilities. Four of the cards are held by a player while the fifth card (called the "starter" card) is placed face up on the table and is used by both players to complete their hand of 5 cards.

Scoring a Cribbage hand is a little involved (thus the desire for a computer program). Here are the rules:
1. 2 points are awarded for each pair within the 5 cards. (A pair is 2 cards of the same face value, disregarding suit.)
2. 4 points are awarded if all 4 cards that a player is holding have the same suit (but the starter card is of a different suit). However, if all 5 cards are of the same suit, award 5 points instead of 4.
3. 3, 4, or 5 points are awarded for each *distinct* straight of 3, 4, or 5 cards. (The use of the word, *distinct*, here means that given two such straights, at least one card is different.) A straight consists of cards with consecutive face values, *disregarding* suit (note: a card with face value ten 'T' follows a 9, a jack follows a ten, a queen follows a jack, and a king follows a queen). For instance, the cards: `8D 9C TD JH QS` constitute a 5 card straight. Aces always represent a value of 1. (Some card games refer to this as "aces low"). Points are *not* awarded for a straight that is completely contained within a larger straight. For example, a 5 card straight only gets 5 points, not 5 + 2*4 + 3*3 = 22. You don't get to count the 4 card and 3 card straights contained with the 5 card straight. However, the hand: `2D 3H 3S 4C`, contains two distinct 3-card straights (`2D 3H 4C` and `2D 3S 4C`) which earns 6 points.
4. 2 points are awarded for each combination of 2 or more cards whose face values add up to 15. (Again, aces count as 1. Jacks, Queens, and Kings all count as 10.)
5. 1 point is awarded if a player is holding a jack of the same suit as the starter card.

Some examples

Example 1. If a player is holding the four cards: `5H`, `5D`, `7D`, `JD` and the starter card is `8D`, the hand should score:

> 2 points for the pair (`5H` & `5D`)
> 2 points for the combination `5H` & `JD` that adds to 15
> 2 points for the combination `5D` & `JD` that adds to 15
> 2 points for the combination `7D` & `8D` that adds to 15
> + 1 point for holding the jack of the same suit as the starter card
> 9 points total

Example 2. If a player is holding the four cards: 5H 5D 6C 7S and the starter card is 8H, the hand should score:

       2 points for the pair (5H & 5D)

        4 points for the straight: 5H 6C 7S 8H

        4 points for the straight: 5D 6C 7S 8H

   + 2 points for the combination 7S & 8H that adds to 15

    12 points total

Example 3. If a player is holding the four cards: 5C 4C 6C JS and the starter card is TS, the hand should score

        3 points for the straight: 4C 5C 6C

        1 point for the jack that is of the same suit as the starter card

        2 points for the combination 5C 4C and 6C that adds to 15

        2 points for the combination 5C and JS that adds to 15

   + 2 points for the combination 5C and TS that adds to 15

    10 points total

Example 4. If a player is holding the four cards: AS 2S 3S 4S and the starter card is 5S, the hand should score:

        5 points for the straight: AS 2S 3S 4S 5S

        5 points since all five cards are of the same suit

   + 2 points for the combination AS 2S 3S 4S 5S that adds to 15

    12 points total

Input File (cribbage.in)

The input file contains several test cases, one test case per line. Each line contains the representation for 5 cards. The first four cards on the line are those that a player is holding and the fifth card on the line is the "starter" card. Each card will be represented by a 2 character code. The first character represents the face value of a card, while the second character represents a suit. Each card will be separated from the others by a single space; and a card may occur at most once in a given test case. The end of the file is indicated by a line that contains 5 zeros (0 0 0 0 0).

Output File (cribbage.out)

For each test case your program should output the corresponding Cribbage score. The output for each test case should be printed on a separate line. There should be NO spaces in the output.

Example Input File

```
5H 5D 7D JD 8D
5H 5D 6C 7S 8H
5C 4C 6C JS TS
AS 2S 3S 4S 5S
0 0 0 0 0
```

Example Output

```
9
12
10
12
```