Programming and Problem Solving CSIS 2610

Fall Semester 2017 — CRN 41507

Project 1 — Poker Hands

Due date: Friday, October 6, 2017

Goal

Develop and implement an algorithm that determines what kind of hand a poker player has.

Details

Poker comes in many variations, but most tend to have a standard set of rankings of a five-card hand. The rankings are, from highest to lowest:

1.	Royal flush	The ace, king, queen, jack and ten of the same suit
2.	Straight flush	Five cards of the same suit with adjacent ranks
3.	Four of a kind	All four cards of one rank plus any other card
4.	Full house	Three cards of one rank and two cards of another rank
5.	Flush	Any five cards of the same suit
6.	Straight	Any five cards of adjacent rank
7.	Three of a kind	Three cards of one rank and two cards of different ranks
8.	Two pair	Two cards of one rank, two cards of another rank and any fifth card
9.	One pair	Two cards of one rank and three cards of differing ranks
10.	Any other set of five cards	

A hand's rank is the highest rank that it matches in the list (the "Bugs Bunny problem," see https://www.youtube.com/watch?v=ZyfKota1eSQ)

Your program is to read a list of five cards from the user (via `cin`) and determine which type of hand was input.

A card consists of a single number, an integer in the range $0 \le c \le 51$ which is converted into a suit and rank by dividing by 13 and taking the quotient or remainder, according to the following table:

	2	3	4	5	6	7	8	9	10	J	Q	K	A	
♣	0	1	2	3	4	5	6	7	8	9	10	11	12	$\rightarrow /13 = 0$
♢	13	14	15	16	17	18	19	20	21	22	23	24	25	$\rightarrow /13 = 1$
♡	26	27	28	29	30	31	32	33	34	35	36	37	38	$\rightarrow /13 = 2$
♠	39	40	41	42	43	44	45	46	47	48	49	50	51	$\rightarrow /13 = 3$
	$\downarrow$ %13 = 0	$\downarrow$ %13 = 1	$\downarrow$ %13 = 2	$\downarrow$ %13 = 3	$\downarrow$ %13 = 4	$\downarrow$ %13 = 5	$\downarrow$ %13 = 6	$\downarrow$ %13 = 7	$\downarrow$ %13 = 8	$\downarrow$ %13 = 9	$\downarrow$ %13 = 10	$\downarrow$ %13 = 11	$\downarrow$ %13 = 12	

As an example, the seven of diamonds is assigned the number 18. Dividing by 13 gives 1 (ignoring any remainder) while taking the remainder after dividing by 13 gives 5. In general, given any card number, dividing by 13 gives the suit (as a number) and taking the remainder gives the rank. Try it! Your program must do the following:

- Read in five cards using the format in the above table
- Determine the type of hand that was input
- Output an appropriate message indicating the type of hand

You may assume that the cards are input from lowest rank to highest rank, but not necessarily in any suit order.
Note: An ace can sometimes count as a high card or a low card (a "one") in a straight. For our program, it will always be a high card.

▹*The algorithm*

We will work on the algorithm in lab; you'll turn it in as part of the project before continuing on to coding, just to make sure that you're on the right track up to that point.

What to turn in

Turn in a copy of your algorithm and source code.

Examples

▹Example 1

Input

```
10 50 38 51 25
```

Output

```
Three of a kind
```

▹Example 2

Input

```
26 40 15 3 30
```

Output

```
Straight
```

▹Example 3

Input

```
46 9 23 50 38
```

Output

```
Nothing
```