VG101 — Intoduction to Computer and Programming

Lab 2 — Kana's Card Game

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Goals of the Lab

- Cell Arrays in MATLAB
- Function
- Recursion

Introduction

One day, Kana[1] got a deck of playing card and had a card game with her sisters. However, she soon realized that the greedy method hardly lead to the final goal. So she turned to you for all the ways to use a specific set of cards.

Cell Arrays

Since Kana may use different numbers of cards each time, you will need to store strings of differents lengths. There are several ways to do this in MATLAB and the teaching assistents recommends the cell arrays. Please look up the MATLAB documentation to see what are cell arrays, how to construct cell arrays and how to use cell arrays.

Basic Rules[2]

The rules that the Minami's are using is a simplified version of other card games, there are only 4 kind of categories:

- Solo (3)
- Pair (3-3)
- Trio (3-3-3)
- Four (3-3-3-3)

Kana will provide the number of each figure from A to K that she has in the file **CardGame.in**, e.g. `[ 0 0 2 0 0 0 0 0 0 0 0 0 0 ]` which refers to '3,3'.

Please write a MATLAB function to generate all the ways to use the cards, and use a MATLAB script the read the input and output the result to the file **CardGame.out**e.g.

```
3
3

3 3
```

Ending

Now Kana can clearly see all the ways to use her cards so that she has more time to memorize the used cards and make better decissions. However, she is also interested in the advanced rules with more categories as follows, **you may try it as you like**.

- Solo Chain (3-4-5-6-7)
- Trio + Solo (3-3-3+4)
- Trio + Pair (3-3-3+4+4)
- Trio Airplane (3-3-3-4-4-4)
- Trio Airplane + Solo (3-3-3-4-4-4+5+6)
- Trio Airplane + Pair (3-3-3-4-4-4+5-5+6-6)
- Pair Sisters (3-3-4-4-5-5)
- Four + Dual solo (3-3-3-3+4+5)
- Four + Dual pair (3-3-3-3+4-4+5-5)

References

[1] Sakuraba, Koharu. *Minami-ke*. vol.1, Kodansha, 5 Nov. 2004, pp. 6.

[2] Liu, Yihao. “Lab 2”. *umjicanvas.com*, 5 Jun. 2018, umjicanvas.com/courses/848/files/122129/download?wrap=1. Accedded 5 Jun. 2018.