BBM203: Software Laboratory-1
2020 Fall
Assignment #1 (Solitaire Game With Arrays)

Report Mert Tazeoğlu, 21946606

November 16, 2020

Table Of Contents **Page**

1. Cover Page.....1
2. Software Design Notes.....2
2.1. Problem.....2
2.2. Solution.....2
2.2.1. Solution and Design Notes.....2
2.2.2. Class Diagram and Explanation.....3
2.2.3. Purposes Of Using Arrays.....3
3. References.....3

2. Software Design Notes

2.1. Problem

Our main problem and main interest in this assignment is, making practise with static data structures such as arrays, multidimensional arrays and also input output (I/O) operations. For that with using C++ programming language we are implementing Klondike Soliatre, which is classic version of soliatre.

2.2. Solution

Solution is simple. First of all program reads a deck file, a command file and stores their data in arrays. After that with using data in arrays, program creates and implements game table. Then executes commands one by one. Also program is careful about error handling. At the last, program creates and writes “status of game table”, “last command” and “errors” in a output file. Input and output files’ names are taking as command line arguments.

2.2.1. Solution and Design Notes

Most important part of the problem is dynamic functionality. For example, in the “move pile” command there are different situations as moving different number of cards. In this situation moving cards in correct order is hardest part. Also using arrays everywhere is another hard thing. Arrays aren’t as flex as linked list in dynamic operations.

Because of lack of time (quizzes, exams, health problems etc.) my program only contains 1 file and its not a good practise. Better practise is including different classes such as card, fileOperations, game etc.

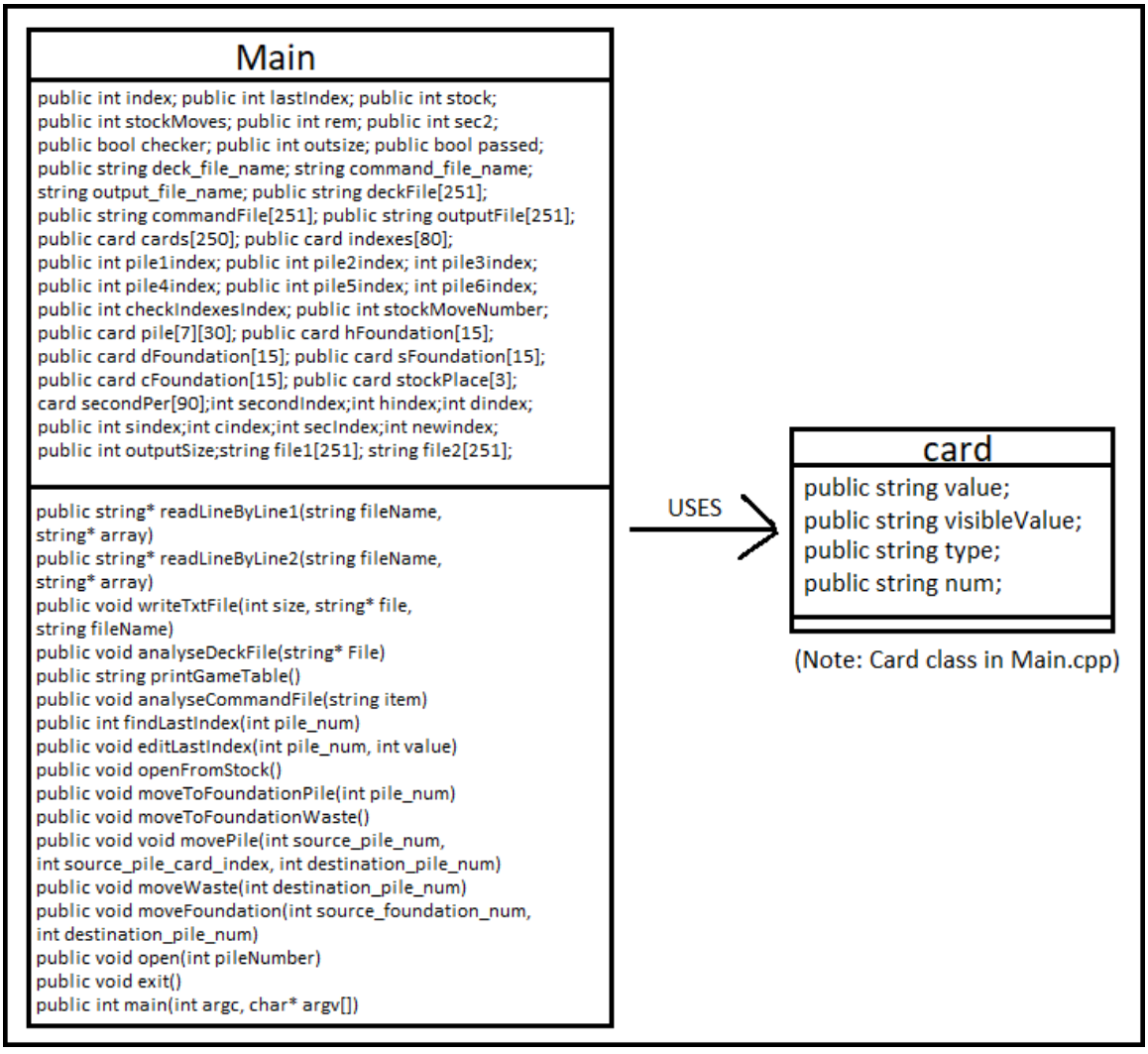
Very Important Note: If i compile and run my program in Windows OS; it works well; but if i compile and run my program in DEV server, it compiles but i when i run it get segmentation error. I tried to solve this situation for hours, but i wasn’t able to do it. (Also dos2unix doesnt solve this situation too, also there are more people gets segmentation error in DEV server interestingly) Because of these reasons, if you run program in Windows, it will work without segmentation error.

2.2.2. Class Diagram and Explanation

My program only has Main.cpp file. In Main.cpp file; there is card class and 17 methods. “readLineByLine1” and “readLineByLine2” are file reading methods. Only difference between them is, 2nd method also calculates length of output file for preventing time and space complexity. Also “writeTxtFile” method creates and writes output file.

After read operations, “analyseDeckFile” method runs. This method creates and initializes game table. Also “analyseCommandFile” method analyzes command file and executes correct operations in correct order. With using “printGameTable” method, we write current game table to output file.

Also findLastIndex and editLastIndex methods access and change piles last item index. openFromStock, moveToFoundationPile, moveToFoundationWaste, movePile, moveWaste, moveFoundation, open, exit methods are functions of game, which are stated in Piazza. Class diagram is like this:



2.2.3. Purposes of Using Arrays

In my program, i used integer, string, card (i created card class). Also for data structure; i only used arrays because it was mandatory. Advantages of using arrays and advantages of arrays against other data structures are these:

- Arrays are fixed size collection data structures. Arrays are used to represent multiple data items of same type by using only single name.
- With using arrays, we can store same type data members easily.
- Two dimensional arrays are used to represent matrices. In this assignment, we can think game table as a multidimensional array.
- Biggest advantage of arrays is memory efficenty. If we compare arrays and linked list (which are most popular and most used ones) array operations have less time complexity. Because of that array operations cost less and they are more efficient.
- (Not in this assignment but in real life) most of data structures are such as linked lists, stacks, queues, trees, graphs are implemented by using arrays.

3. References

BBM203 Software Laboratory First Assignment Introduction PDF File
https://web.cs.hacettepe.edu.tr/~bbm201/Lectures/BBM201-Lecture3.pdf
https://www.geeksforgeeks.org/ (For Different C++ Functions In Programming Step)
https://www.quora.com/What-is-the-purpose-of-an-array-in-C-programming (Importance Of Arrays In Report Step)