BBM 104 ASSİGNMENT-4 REPORT

Tolga Furkan Güler

21692874

➢ What is the problem and main purpose of this assignment

In this experiment, we are expected to build a simplified version a game which is called "Bejeweled". The game consists of a grid of "Jewels".We have 9 different type of Jewels which are "D", "S" , "T" , "W" , "/" , "\" , "|" , "+" ,"-". In this game we select a coordinate and check if the jewel in this coordinate has triple match or not. Every jewel perform its own rule for triple matching. "D" can match with other "D" only in diagonal coordinates. "S" can match with "S" only in horizontal coordinate . "T" can match with "T" only in vertical coordinate. "W" can match any jewel in any direction. "/" can match any other mathematical symbol jewel only in right diagonal. "-" can match any other mathematical symbol jewel by searching horizontally. "+" can match any other mathematical symbol jewel by searching first horizontally after that vertically. "\" can match any other mathematical symbol jewel only in left diagonal. "|" can match any other mathematical symbol jewel vertically. These are rule of triple matching for each Jewel so the goal is the find triple match in a row,column or diagonal and if player find a triple match,the three Jewels are deleted,and other jewels which are above these jewels fall from the top and fill the gaps.if there is no matching program will asking for new coordinate.

Every jewel have its own point.İf the player find a triple match ande deleting these three jewels get the point .This point can change according to type of these deleting jewels.

When the game is finish, the names and points of each player are written into txt file which is called leaderboard.txt. According to this file the program will write the player's total score and rank.

➢ Explanation of my Code

First of all, I define a ArrayList which is include String array.After that I read the gameGrid.txt and fill the array according to this txt file so I obtain game grid. After that use the BufferReader class and create an object with "new InputStreamerReader(System.in) " parameter so ı can take the command from user at the same time when I run the program with the < test_case1.txt addition I can take the commands from the this "test_case1.txt" file.After that according the command which are teken from user or input file I did the necessary operation. I got the coordinates and checked what jewel was in that coordinate.

I created a İnterface which is include deleting and shifting function and I created a class for each jewel.

```
import java.util.ArrayList;

public interface Jewels {

    public ArrayList<String[]> deleting(ArrayList<String[]> map,int x,int y);
    public ArrayList<String[]> shifting(ArrayList<String[]> mapNew, int k, int l, int o, int p, int u, int y);

}
```
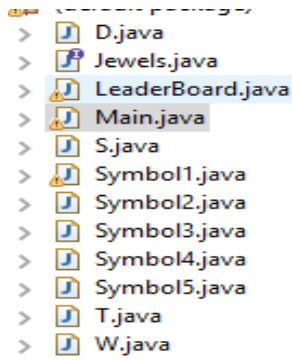
All of these class implements this interface and override deleting and shifting methods.Deleting method is return a ArrayList and this ArrayList is the new state of our grid.Shifting method is also return a ArrayList and this Arraylist is the new shifting state of our grid.I used this shifting method in the deleting method and we obtain the final state of our grid and return this.By the way each jewels class has its own points variables

In Main class I take the coordinates and checked which jewel is this.After that I create an object from this Jewels class and using this object I call the deleting methods and obtain new state of my grid.I also obtain how many points player have.

If the command which is taken from user or input file is 'E', I broke the loop and print "Enter name".I have LeaderBoard class an this class have name and score variables.After "Enter name" section I create an object from the LeaderBoard class and add this object in a ArrayList which is include LeaderBoard type variables.For sorting these objects by score LeaderBoard class need to implements Comparable interface and override compere to method.After that Collection.sort(ArrayList) was sufficient to sorting this ArrayList by score.After sorting the ArrayList I printed situation of the player.At the end of the game I printed "Good Bye".

- **My methods**

```java
import java.util.ArrayList;

public interface Jewels {

    public ArrayList<String[]> deleting(ArrayList<String[]> map,int x,int y);
    public ArrayList<String[]> shifting(ArrayList<String[]> mapNew, int k, int l, int o, int p, int u, int y);

}
```

I created Jewels Interface and define these two methods "deleting" and "shifting" deleting methods take coordinate which is taken from user and grid.İf there is triple matching deleting these three jewels inside of the deleting methods using shifting methods, other jewels which are above these jewels fall from the top and fill the gaps.At the end of the method I returned new state of the our grid and print the grid in Main class.

Shifting method take every deleting jewels coordinates (x,y) as parameter and also take grid which is deleting in deleting methods.in shifting method every gaps control is there a jewel above or not.if there is jewel above the gap, gap is filled with jewel which is on above the gap if there is nothing above the gap I broke the loop.

❖ UML Diagram Of My Design

<<Java Class>>
Ⓒ Symbol1
(default package)

△ point: int

Ⓒ Symbol1()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ T
(default package)

△ point: int

Ⓒ T()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ S
(default package)

△ point: int

Ⓒ S()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ Main
(default package)

△ⁱrowCounter: int
△ⁱcolumnCounter: int

Ⓒ Main()
● main(String[]):void

<<Java Class>>
Ⓒ Symbol2
(default package)

△ point: int

Ⓒ Symbol2()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ W
(default package)

△ point: int

Ⓒ W()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● shifting2(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ Symbol3
(default package)

△ point: int

Ⓒ Symbol3()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● shifting2(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Interface>>
ⓘ Jewels
(default package)

● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ LeaderBoard
(default package)

▫ name: String
▫ score: int
▫ rank: int

Ⓒ LeaderBoard(String,int)
● getName():String
● setName(String):void
● getScore():int
● setScore(int):void
● getRank():int
● setRank(int):void
● compareTo(Object):int

<<Java Class>>
Ⓒ Symbol4
(default package)

△ point: int

Ⓒ Symbol4()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ Symbol5
(default package)

△ point: int

Ⓒ Symbol5()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>

<<Java Class>>
Ⓒ D
(default package)

△ point: int

Ⓒ D()
● shifting(ArrayList<String[]>,int,int,int,int,int,int):ArrayList<String[]>
● deleting(ArrayList<String[]>,int,int):ArrayList<String[]>