INFO-5100 Final Quiz

Instructions :

- Create seperate .java file for each problem
- Main method should be included in the code
- Push the code in the Github link you have shared with us(via Google doc)
- Late submission will have a penalty of -0.1 per minute

Question 1 (10 marks)

Design a class which will have final method or variable or class. An interface called iRobot is given below Which has the following methods.

```
interface iRobot {
  boolean move();
  void turnLeft();
  void turnRight();
  void clean();
}

public enum Direction {
  UP,
  DOWN,
  LEFT,
  RIGHT
}
```

- Create a class called `Roomba` which will implement the interface `iRobot`
- This class will have an integer matrix (2 dimensional array) called `room` as a member.
    - Each cell of the matrix is considered a spot in the room
    - If spot is not cleaned, it is '0'
    - If spot is cleaned, it is '1'
    - If spot is blocked, it is '-1'
- Assume that the robot is at the spot (0, 0) in the matrix `room` and facing to the `Direction => Direction.DOWN`
- Implement the following methods
    - `boolean move()`
        - returns true if next spot/cell is open and robot moves into the spot/cell.
        - returns false if next spot/cell is obstacle and robot stays on the current spot/cell.
    - `void turnLeft()`
        - robot will turn 90 degrees to the left but will stay on the same spot/cell.
    - `void turnRight()`
        - robot will turn 90 degrees to the right but will stay on the same spot/cell.
    - `void clean()`
        - robot will clean the current spot/cell.

Question 2 (5 marks)

Given an array of strings strs, group the anagrams together. You can return the answer in any order.

An Anagram is a word or phrase formed by rearranging the letters of a different word or phrase, typically using all the original letters exactly once.

Example 1:

```
Input: strs = ["eat","tea","tan","ate","nat","bat"]
Output: [["bat"],["nat","tan"],["ate","eat","tea"]]
```

Example 2:

```
Input: strs = [""]
Output: [[""]]
```

Example 3:

```
Input: strs = ["a"]
Output: [["a"]]
```

Constraints:

- strs[i] consists of lowercase English letters

Question 3 (5 marks)

Given an array of integers nums and an integer k, return the total number of continuous subarrays whose sum equals to k.

Example 1:

```
Input: nums = [1,1,1], k = 2
Output: 2
```

Example 2:

```
Input: nums = [1,2,3], k = 3
Output: 2
```

Question 4 (10 marks)

4. Create a class of Netflix that has list of Genre. Genre class has list of Movie. Movie class has Title of movie, Release date, List of actors, Director
    - Add List of movies based on the classes created above.
    - For all movies released before 2000, add the string "(Classic)" to the title of the movie using flatMap.
    - Get the latest 3 movies released using .limit() method of stream.
    - Create a predicate for release date before 2000 and a predicate for release date before 1990 and then Chain the predicates for finding movies between 1990 and 2000.
    - Write a method which that will add release year in the title of the movie and return the title and then use this method for all the movies.
    - Sorting on one of the feature(Ex: Released year or title) which will use comparator.