Project Description: News Outlet

Objective:

The object of this project is to build small yet complex software that leverages the knowledge of the data structures we learned during the course.

At its core, our news outlet software should serve users the most updated and hyped news content. Initially, given a JSON file as the database of news, the software will scan the content and load the news. You must use the following schema to represent your news object.

```
class News
{
   int ID; // Unique id for each news
   long Time; // Time of news publication which is based on EPOCH
   string[] Keywords; // Keywords that best describe the content of news
   string Content; // The content of news
   int Hits; // Number of times that news has been retrieved
}
```

Each user allows to either see the current news or go back in time and search for news based on some keyword or time.

The news outlet software has two sections, recent news, and trending news. Recent news is that that happened in the last 24 hours. Trending news is the news that has the most hits based on user activity. Every time that a user read a piece of news, your system should increase the hit number of that news.

The following are the commands that users can use to play with your software:

1. **SHOW** <recent/trending> --keywords --time
2. **SELECT** <ID>
3. **BACK**
4. **SET** <time>

The “SHOW” command, shows and filters the news content based on the optional variables either from the trending section or the current section.

The “SELECT” command, shows the one news based on the id. You need to increase the hits of that news after selection.
The “BACK” command, go the previous news that the user was reading. It should do nothing in case there was no previous news.
The “SET” command, allows me to change your software's current time for debugging.

The following are the *mandatory* features:

1. Users should be able to interact with your software through a console-based interface.
2. When you are sorting the news based on either time/trending, you need to show up to 500 objects in each section.
3. Your system must have persistent storage (to be able to load from a disk). To do that you should use a JSON format.
4. The news contents should at least be searchable through their ID, keywords, and time.
5. Our software should be equipped with the fake initial time that represents system time. And you should work with that. The default value for the fake time is the current system time.

The following are the bonus features:

1. We assume that our memory is limited. At any given time, you are only allowed to load up to 1000 elements into RAM. You need to design your system in a way that works with RAM and disk seamlessly. (You may use more than 1000 elements only at the initialization level)

The news outlet project is designed in a way that you need to use a variety of data structures that we learn during the course. Therefore you need to use the following data structures concepts to achieve that:

Stack, Queue, List/Array, HashMaps, LRU

Notes:

- You are allowed to use the C# internal library in your software.
- Each team has to present its project to me.
- If you implement the whole project just by using List/Array, you will lose some points.

- You should be able to analyze the runtime complexity of different parts of the project e.g my software search complexity is O(nlogn) since ….

Grading:

- The total point for this project is out of 100.
- 60% for all team members and 40% per person.

Section	Grading
Overall functionality	20%
Commands	20%
Use a variety of data structures to achieve your goal	20%
Bonus features	10%
Total	70%

An example from JSON schema that you will use to load your data:

```
   {
   "ID":1,
   "Time":"1665062658",
   "Content":"Vestibulum ante ipsum primis in faucibus orci luctus et
ultrices posuere cubilia Curae; Mauris viverra diam vitae quam.
Suspendisse potenti. Nullam porttitor lacus at turpis.",
   "Keywords":["tech", "world"],
   "Hits":1
   }
```

Some examples of commands I may use to test your project:

```
SHOW recent
SHOW recent --keywords "tech" --keywords "sport"
BACK
SET 1679319432
```