CSCI 3005 – SP 2022 – PROGRAMMING ASSIGNMENT 1: *History Grading*

A history professor likes to give exams in which students are asked to put several historical events into chronological order. Students who order all the events correctly will receive full credit, but how should partial credit be awarded to students who incorrectly rank one or more of the historical events?

After considering various options, the professor decides to give students 1 point for each event in the longest (not necessarily contiguous) sequence of events which are in the correct order relative to each other. For example, if four events are correctly ordered 1 2 3 4 then the order 1 3 2 4 would receive a score of 3 (event sequences 1 2 4 and 1 3 4 are both in the correct order relative to each other). Your task is to implement a program that applies this grading strategy.

The problem can be solved using the *hidden patterns* dynamic programming approach studied in class (except that, instead of patterns of individual characters, your program will analyze sequences of strings, with each string representing a historical event).

Your assignment is to write a Java class named **Patterns** which provides public methods with the following signatures and functionality:

`Patterns(String filename)`**:** constructor to process a file containing the historical events in correct order, with one event per line, as shown below. The first line contains an integer representing the number of events.

`int grade(String filename)`: accepts a file containing a student's responses (same format as before) and computes the score (length of longest sequence of events in correct relative order).

`String pattern(String filename)`: accepts a file containing a student's responses (same format as before) and returns a String containing the events that make up the longest sequence in the correct order, separated by commas.

You should initially test your methods using the `PatternsTest` class and sample text files provided. For instance, consider the expected output given the sample constructor input file and test file below:

```
10
US Independence
French Revolution
WW I
Great Depression
WW II
Korean War
British Invasion
Vietnam War
Gulf War
Dot Com Era
```

Sample test file (the grade method should return 3)	The pattern method should return a single string containing
7 Korean War British Invasion WW I Vietnam War Great Depression US Independence French Revolution	Korean War,British Invasion,Vietnam War

The source code for **Patterns.java** should be submitted to Mimir. As in previous courses, your program will be graded based on correctness of results, documentation, selection of data structures, design, and style.