Practical 8 (VPL) (due 2022-09-30 @ 09:00)

The purpose of this practical assignment is for you to become familiar with Sequential File Handling and Exception Handling.

This practical assignment must be completed on the VPL under Practical 8 so that it can be auto-marked and uploaded to EVE afterwards before the specified deadline.

You have been provided with the following to aid you in developing the solution:

- A `main.cpp` file containing code that will be used to test your program.
- An `array_values.txt` file containing values that must be inserted into the 2D array contained in the `Matrix2D` class. The data in the file is structured as follows:

  -
    ```
    ROW COL VALUE
    ROW COL VALUE
    …
    ROW COL VALUE
    ```

  where `ROW` represents the row coordinate, `COL` represents the column coordinate and `VALUE` represents an integer value to be placed at that specific location in the 2D array.

Add the following to the `Matrix2D` class from Practical 6 (you are welcome to use the solution for Practical 6 as a starting point. However, you must indicate such at the beginning of each source file to avoid committing plagiarism):

- A member function called `readValuesFromTXT` that accepts a string representing the path to the specified text file. The function must read the file and save the values to the 2D array using the row and column coordinates from the file. **Note the following:** Some of the row/column coordinates from the file might be outside the bounds of the array, and this must be handled inside the function. The function must use the `enforceRange` function to ensure that the row and column coordinates are within the bounds of the 2D array.
- A member function called `outputRowSumsToConsole` that outputs the sum of the elements of each row from the matrix to the console. The function must loop through each row and calculate the sum of all the values in that row, and then output the sum via **`cout`**. The output should look like the following:
  - `ROW1_SUM ROW2_SUM … ROWN_SUM`

  where `ROWN_SUM` is an integer representing the sum of all the elements of that row. The sums are separated by a space character.
- An `Exception` class with the following derived classes:
  - A `FileException` class that must be thrown by the member function specified above whenever it fails to open the file.
  - A `RangeException` class that must be thrown by the `enforceRange` function if a value is out of range.
- You do not need to place code inside any of the exception classes. You only need to create an inheritance hierarchy in the header file.
- Do not worry about catching exceptions. The provided **`main` function** will catch any exceptions that are thrown.
- Your code must work with the provided **main.cpp file**. Do not modify it (even if you do, it will be automatically generated each time your code is executed).

Mark sheet		
	Correct Execution	100