Practical 9 (due 2023-09-29 @ 09:00)

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

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

- A `sensor_readings.cleartext` file containing values that must be inserted into a 2D array contained in an `IIoTMonitor` class (described below). The data in the file is structured as follows:
  - `NUM_ROWS NUM_COLS`
  - `ID DATA_FORMAT READING ACTIVE`
    `ID DATA_FORMAT READING ACTIVE`
    `…`
    `ID DATA_FORMAT READING ACTIVE`

  where `ID` represents the sensor ID, `DATA_FORMAT` represents the sensor's data format, `READING`, represents the sensor reading and `ACTIVE` indicates whether the sensor is active. `NUM_ROWS` and `NUM_COLS` indicate the size of the 2D array.

Create an `IIoTMonitor` that manages a dynamically allocated 2D array of `IIoTSensors` as follows:

- An `IIoTSensor` must be a record structure with the necessary data members for handling the data shown in the file.
- Add a member function called `readSensorsFromTXT` that the class uses to initialise an `IIoTMonitor` object from the sensors in the provided file.
- Add a member function called `exportSensorsToBinary` that saves all the `IIoTSensors` to a binary file. Remember to **disable alignment padding** for the `IIoTSensor` record structure. Only active sensors must be exported to the binary file.
- Add a member function called `exportAverageReadingToTXT` that computes the average sensor reading. The calculated value must be appended to the end of `sensor_readings.cleartext`.
- Add a member function called `getNumSensorsInBinary` that returns the number of sensors in the binary file you created earlier.
- Add a member function called `updateSensor`, which takes the row and column coordinate of the sensor to be updated. The function must update the sensor in the 2D array. After updating the 2D array, all **active** sensors must be rewritten to the binary file in truncate mode.

Mark sheet		
	`Design`	10
	`IIoTSensor record structure with alignment padding disabled`	10
	`readSensorsFromTXT member function`	10
	`exportSensorsToBinary member function`	10
	`exportAverageReadingToTXT member function`	10
	`getNumSensorsInBinary member function`	10
	`updateSensor member function`	10
	`Total`	70