**Problem description and requirement statement**

**You are required to develop a program that implement a Library Management System.**

In the library, there is space to store only 100 books and 50 DVDs (150 items in total).

In this assignment, you will be required to create necessary classes to implement the following functionality*:*

1.       Design and implement a class **LibraryItem** (abstract) *(3 points)* and the subclasses **Book** and **DVD**. The classes should hold information about the ISBN, the Title, the sector, the Publication Date, the Date/Time it has been borrowed and the current reader (in case the book has been borrowed), and include appropriate methods.

In particular:

     The **Book** class should include appropriate methods and hold information about the authors (note that it could be also more than one author), the publisher and the total number of pages *(3 points)*.



     The **DVD** class should include methods and information about the available languages, the available subtitles, the producer and the actors *(3 points)*.



     The class **Reader** should have methods and information about the ID, Name, mobile number and email *(3 points)*.



     You should implement a class **DateTime** to represent the time/date of when the item has been borrowed. Do not use any predefined library for date and time and you can refer as example to the class that has been provided during the tutorials *(2 points)*.



2.       Design and implement a class called **WestminsterLibraryManager**, which implements the interface **LibraryManager**. WestminsterLibraryManager maintains the list of the items in the library and providesall the methods for the library manager actor to manage the library.

The system should have necessary **User Interface** with following options (a single menu from which you can activate the actions) that can be used to perform the following management actions from which the manager can select one.

       **Add a new item**in the library and display the number of free spaces (remember that the library canstore max 150 items: 100 for books and 50 for DVD). Display a message in case there are no spaces available. The user can select if they would like to add a book or a DVD and enter the corresponding information *(6 points)*.



       **Delete an item**, given the ISBN, from the library and display the number of free spaces left. Displaythe type of the item that has been deleted (if it is a book or a DVD) *(6 points)*.



       **Display the list of the items**in the library. For each item display the ISBN, the type of item (if it is a bookor a DVD) and the title *(3 points)*.



       **Borrow an item**in the library given his ISBN. Consider that you need to save the name of theReader (the person who borrows the item) and the date/time that the reader borrowed it. Also, each book can be borrowed for 7 days maximum and each DVD for 3 days maximum. In cases where the item is currently borrowed by another reader, display a message saying it is not available at the moment and when it will be available again *(11 points)*.



       **Return an item**that has been borrowed. Modify the relative current information in the item thathas been returned and that now can be available again. If the item has been returned after the period allowed, then a fee will be applied: the reader will pay £0.2 any extra hour for the first 3 days, then £0.5 per hour. A message will say how much the reader has to pay to the library if the item is returned late *(8 points)*.



       **Generate a report**with all the items overdue and the corresponding fee. Order the list from theitem that has been borrowed for the longest period *(8 points)*.