



Department of Computer Science
COMP2321: Data Structures
Fall 2020/2021; Project No.1

You will build a system to manage patients' data in a hospital. The hospital patient management system stores specific information in the form of health record to keep track of the patients' data.

Your program should read the information from a file called "*patients.txt*" that should be on the following format:

Patient Name#Gender#Date of admission#Date of birth #Illness#Address (City)#Blood type

Example of data input:

Alma Mukhles#F#2212019#01012000#Ear infection#Nablus#B+

Ahmed A. Ali#M#01102020#05101970#Low blood pressure#AlBireh#A-

Your program should be able to do the following tasks:

Options:

1. Read data: read the data of the patients from the file.
2. Create linked list: create a linked list.
3. Sort data: use **Radix** sort to sort the data based on the patients' names.
4. Add patient: add a new patient.
5. Update patient: update patient's information.
6. Delete patient: soft delete (explained below).
7. Search for patients
 - a. Name
 - b. Date of birth
8. List patients
 - a. All patients
 - b. Category (i.e., illness)
 - c. City
 - d. Discharged (Patients who were deleted from the system)
9. Export medical report: export XML file following medical health record standards.
10. Exit: exit from the system and store the information back to the file.

Notes:

- Deleted patients should not be deleted from the linked list (data). Instead, there should be a flag in their record indicating if they are discharged. This means, when exporting the data, all patients, including the records that have been deleted should be kept. However, when listing all patients in the linked list, this data should not be listed.
- For simplicity you may limit the number of patients to $n=100$ and the number of characters m in each name to 50.
- You are allowed to use only character comparisons. Thus, you are not allowed to use the String library functions.
- Export medical report: this should export an XML format of the data in the linked list using the following format:

```
<patient>
  <name>Alma Mukhles</name>
  <gender>F</gender>
  <admissionDate value="2212019" />
  <birthDate value="01012000" />
  <diagnosis>Ear infection</diagnosis>
  <city>Nablus</city>
  <bloodType>B+</bloodType>
</patient>
<patient>
  <name>Ahmed A. Ali</name>
  <gender>M</gender>
  <admissionDate value="01102020" />
  <birthDate value="05101970" />
  <diagnosis>Low blood pressure </diagnosis>
  <city> AlBireh </city>
  <bloodType>A-</bloodType>
</patient>
```

The data is exported to a file called *Report.xml*

Grading policy and general notes on the project:

1. Your application should have all functionalities working properly. Twenty marks will be graded for the functionality of the project.
2. The following notes will make up the remaining 10 marks of the grade:
 - a. There has to be adequate documentation and comments in the code (i.e., functions, loops, etc.).
 - b. Your code should follow the code convention (i.e., spaces, indentations, etc.); and
 - c. Your application should contain a menu to allow the user to select which option(s) .