Trabajo Práctico Cuatrimestral: Especificación

Materia:

- Algoritmos y Estructuras de Datos

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a. **ADT: Person**

Description: represents a person, it can be a teacher or student

   i. **Constructors**:
  - ***newPerson: String: personType X String: name X String surName X String: email X int: phone X int: enrollment → Person***
    - Precondition: -
    - Postcondition: Person initialized

   ii. **Analyzers:**
  - ***takeMaterial: Person X Library X int: code → -***
    - *the person takes the given material*
    - Precondition: person, material and library initialized
    - Postcondition: person takes the material
  - ***leaveMaterial: Person X Library → -***
    - the given person leaves the material it took
    - Precondition: person initialized
    - Postcondition: the material goes back to the library

   iii. **Destructors:**
  - ***freePerson: Person → -***
    - *Frees allocated memory by the person*
    - Precondition: Person initialized
    - Postcondition: Person destroyed

b. **ADT: Teacher**

Description:

   i. **Constructors**:
  - ***newTeacher: String: personType X String: name X String surName X String: email X int: phone X int: enrollment → Teacher***
    - Precondition: -
    - Postcondition: Teacher initialized

   ii. **Analyzers:**
  - ***takeMaterial: Teacher X Library X int: code → -***
    - *the teacher takes the given material*
    - Precondition: *teacher*, material and library initialized
    - Postcondition: *teacher* takes the material
  - ***leaveMaterial: Teacher X Library → -***
    - the given teacher leaves the material it took
    - Precondition: *teacher* initialized
    - Postcondition: the material goes back to the library

   iii. **Destructors:**
  - ***freeTeacher: Teacher → -***

- ○ *Frees allocated memory by the teacher*
- ○ Precondition: teacher initialized
- ○ Postcondition: teacher destroyed

c. ADT: Student
Description:

i. Constructors:
- ● ***newStudent: String: personType X String: name X String surName X String: email X int: phone X int: enrollment → Student***
  - ○ Precondition: -
  - ○ Postcondition: Student initialized

ii. Analyzers:
- ● ***takeMaterial: Student X Library X int: code → -***
  - ○ *the student takes the given material*
  - ○ Precondition: Student, material and library initialized
  - ○ Postcondition: Student takes the material
- ● ***leaveMaterial: Student X Library → -***
  - ○ the given Student leaves the material it took
  - ○ Precondition: Student initialized
  - ○ Postcondition: the material goes back to the library

iii. Destructors:
- ● ***freeTeacher: Student → -***
  - ○ *Frees allocated memory by the* Student
  - ○ Precondition: Student initialized
  - ○ Postcondition: Student destroyed

d. ADT: Material
Description: represents a material with the given information

i. Constructors:
- ● ***newMaterial: String: type X int: code X String: author X String: title X int: year → Material***
  - ○ Precondition: -
  - ○ Postcondition: Material initialized.

ii. Modifiers:
- ● ***changeMaterialCode: Material X int:code → -***
  - ○ *changes the identification code of the given material.*
  - ○ Precondition: Material initialized
  - ○ Postcondition: code changed

iii. Destructors:
- ● ***freeMaterial: Material → -***

- ○ *Frees the allocated memory by the material*
- ○ Precondition: Material initialized
- ○ Postcondition: Material destroyed

e. ## ADT: Material

Description: represents a Book with the given information

  i. **Constructors**:
   - ● ***newBook: String: type X int: code X String: author X String: title X int: year X String: editorial → Book***
     - ○ Precondition: -
     - ○ Postcondition: Book initialized.

  ii. **Modifiers:**
   - ● ***changeBookCode: Book X int:code → -***
     - ○ *changes the identification code of the given book.*
     - ○ Precondition: book initialized
     - ○ Postcondition: code changed

  iii. **Destructors:**
   - ● ***freeBook: Book → -***
     - ○ *Frees the allocated memory by the book*
     - ○ Precondition: book initialized
     - ○ Postcondition: book destroyed

f. ## ADT: Magazine

Description: represents a magazine with the given information

  i. **Constructors**:
   - ● ***newMagazine: String: type X int: code X String: author X String: title X int: year → Magazine***
     - ○ Precondition: -
     - ○ Postcondition: Magazine initialized.

  ii. **Modifiers:**
   - ● ***changeMagazineCode: Magazine X int:code → -***
     - ○ *changes the identification code of the given magazine.*
     - ○ Precondition: magazine initialized
     - ○ Postcondition: code changed

  iii. **Destructors:**
   - ● ***freeMaterial: Magazine → -***
     - ○ *Frees the allocated memory by the magazine*
     - ○ Precondition: magazine initialized
     - ○ Postcondition: magazine destroyed

g. **ADT**: **Loan**

Description: represents a loan between a person and the library

   i. **Constructors**:

- ***newLoan: int: code X int: id → Loan***
    - Precondition: -
    - Postcondition: Loan initialized.

  ii. **Modifiers:**

- ***toPay: Loan → double amount***
    - *calculates the amount of money to pay with the two dates.*
    - Precondition: Loan initialized
    - Postcondition: amount to pay

 iii. **Destructors:**

- ***freeLoan: Loan → -***
    - *Frees the allocated memory by the loan*
    - Precondition: Loan initialized
    - Postcondition: Loan destroyed

h. **ADT**: **Library**

Description: represents a library with materials to take

   i. **Constructors**:

- ***newLibrary: - → Library***
    - *creates a new library*
    - Precondition: -
    - Postcondition: Library initialized

  ii. **Modifiers:**

- ***loadMaterial: Library X Material → -***
    - *loades a new material to the library*
    - Precondition: Library initialized
    - Postcondition: book added to the library
- ***deleteMaterial: Library X int:code → -***
    - deletes the material with the given code
    - Precondition: Library initialized
    - Postcondition: material deleted from library
- ***loadPerson: Library X Person → -***
    - creates a new user to operate with the library
    - Precondition: Library initialized.
    - Postcondition: person user created
- ***deletePerson: Library X int:id → -***
    - deletes the person with the given id
    - Precondition: Library initialized
    - Postcondition: person deleted from library

iii. Analyzers:

- *getMaterial: Library X int: code → Material*
  - *searches for the material with matching code*
  - Precondition: Library initialized.
  - Postcondition: material returned

iv. Destructors:

- *freeLibrary: Library → -*
  - *Frees the allocated memory by the library*
  - Precondition: Library initialized
  - Postcondition: Library destroyed