

FACULTAD DE INGENIERÍA

GRUPO 5

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Exercise 3 ADT

**Index**

**Library 2**

**Book 3**

**Magazine 3**

**Borrowing 4**

**Person 5**

**ADT: Library**

**Description**: a place which stores books and magazines where registered people can go and borrow them.

Constructor

**Library**: ---- → Library

**Comment**: creates an empty library.

**Precondition**: ----.

**Postcondition**: an empty library.

Modifier

**addBooks**: Library X Books → Library

**Comment**: adds the specified books to the library.

**Precondition**: books.

**Postcondition**: the library with the books added.

**addMagazines**: Library X Magazines → Library

**Comment**: adds the specified magazines to the library.

**Precondition**: magazines.

**Postcondition**: the library with the magazines added.

**addPerson**: Library X Person → Library

**Comment**: registers the specified person to the library.

**Precondition**: person.

**Postcondition**: the library with the person registered.

**makeBorrowing**: Library X Person X materialType X bookCode → Library

**Comment**: checks if the person is registered and registers it if it isn’t. Checks whether the material type is a book or magazine. Then checks if the material is in the library and if it is, borrows it to the person.

**Precondition**: a person, material type and a material code.

**Postcondition**: the library with the material borrowed.

**acceptReturn**: Library X Borrowing → Library

**Comment**: checks the borrowing material type, takes the material and returns it to the library.

**Precondition**: a borrowing.

**Postcondition**: the library with the material available.

**ADT: Book**

**Description**: reading material stored in a library for people to borrow.

Constructor

**Book**: code X author X title X year X editorial → Book

**Comment**: creates a book with the specified information which is not borrowed.

**Precondition**: a code, author, title, editorial and an integer > 0 for the year.

**Postcondition**: the book with the specified information which is not borrowed.

Modifier

**borrow**: Book → Book

**Comment:** changes the book’s status to borrowed.

**Precondition**: a book.

**Postcondition**: the book with its status being borrowed.

**return**: Book → Book

**Comment**: changes the book’s status to available.

**Precondition**: a book.

**Postcondition**: the book with its status being available.

Analyzer

**isAvailable**: Book → boolean

**Comment**: checks whether the book is available or not.

**Precondition**: a book.

**Postcondition**: true if the book is available, false if not.

**ADT: Magazine**

**Description**: reading material stored in a library for people to borrow.

Constructor

**Magazine**: code X author X title X year → Magazine

**Comment**: creates a magazine with the specified information which is not borrowed.

**Precondition**: a code, author, title and an integer > 0 for the year.

**Postcondition**: the magazine with the specified information which is not borrowed.

Modifier

**borrow**: Magazine → Magazine

**Comment**: changes the magazine’s status to borrowed.

**Precondition**: a magazine.

**Postcondition**: the magazine with its status being borrowed.

**return**: Magazine → Magazine

**Comment**: changes the magazine’s status to available.

**Precondition**: a magazine.

**Postcondition**: the magazine with its status being available.

Analyzer

**isAvailable**: Magazine → boolean

**Comment**: checks whether the magazine is available or not.

**Precondition**: a magazine.

**Postcondition**: true if the magazine is available, false if not.

**ADT: Borrowing**

**Description**: an agreement between a person and the library where the person takes the material from it.

Constructor

**Borrowing**: id X materialCode X materialType X borrowingDate X returnDate → Borrowing

**Comment**: creates a borrowing with the specified information.

**Precondition**: an id, material code, material type, borrowing date and return date.

**Postcondition**: the borrowing with the specified information.

**ADT: Person**

**Description**: someone capable of borrowing and returning material from a library. It can be a student or professor and can only have one borrowing at a time.

Constructor

**Person**: personType X name X lastName X email X phoneNumber X id → Person

**Comment**: creates a person with the specified information and no borrowing.

**Precondition**: a person type, name, last name, email, phone number and id.

**Postcondition**: the person with the specified information and no borrowing.

Modifier

**makeBorrowing**: Person X Library X materialType X materialCode → Person

Comment: makes a borrowing at a library.

Precondition: a library, material type and material code.

Postcondition: the person with the borrowing.

**returnBorrowing**: Person X Library X Borrowing → Person

Comment: returns the borrowing to the library.

Precondition: a library and a borrowing.

Postcondition: the person with no borrowing.