Laboratory Assignment AND Assessment Requirements Specification

Version 1.0

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Version History

Version	Description of Change	Author	Date
V01	Improvement of document	Both students	19 March 2023
V02	Completion of document	Both students	19 March 2023

Contents

Analysis and design Document

1 Functional Requirements

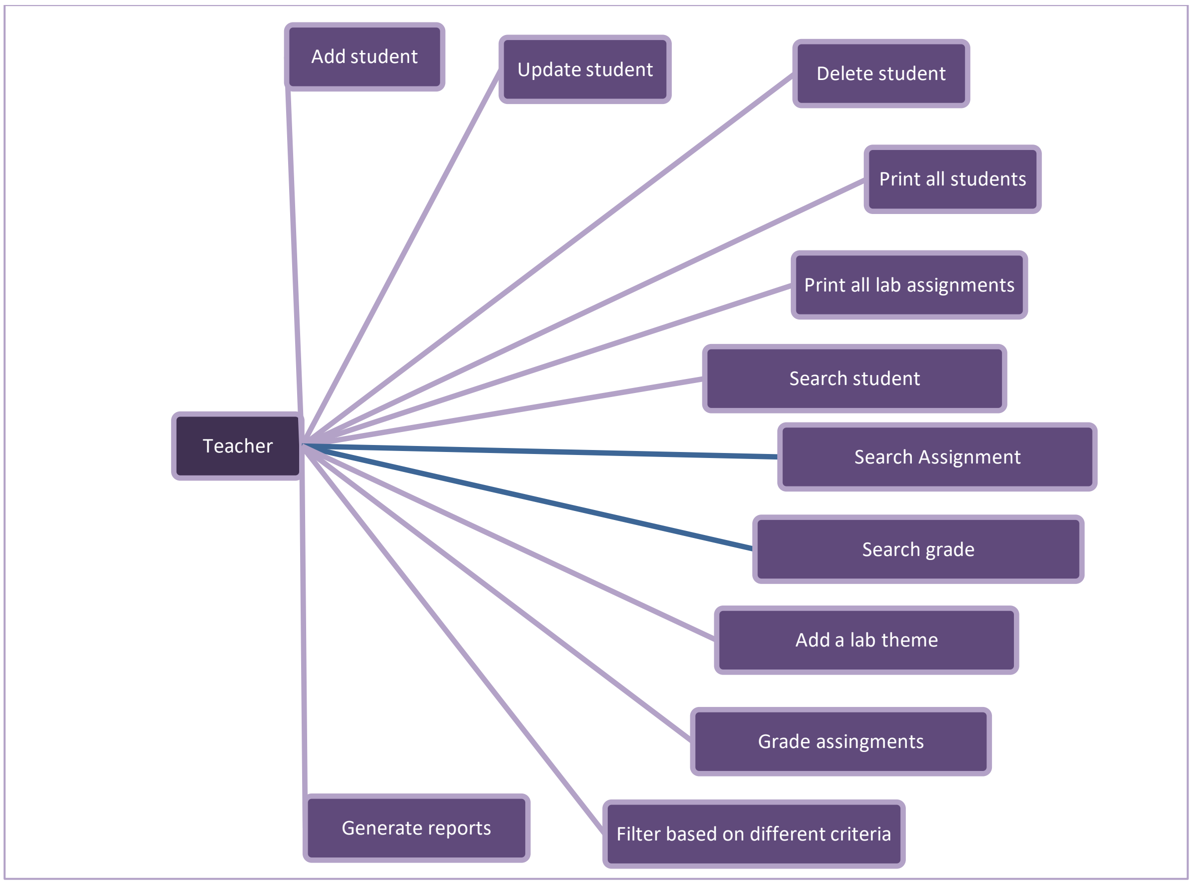
List the functional requirements (FR) of the system.

Section/ Requirement ID	Requirement Definition
FR1.0	Implement CRUD operations for the Student entity
FR2.0	Manage laboratory themes and subjects.
FR2.1	Extend the deadline for an existing subject
FR2.2	Add a new laboratory theme
FR2.3	Notify students by email when adding a new laboratory theme or modifying the delivery date of an existing subject
FR2.4	Add a grade to a particular laboratory theme to a particular student
FR3.0	Filter students based on different criteria
FR4.0	Generate reports

2 Actors

- Teachers for MAP subject

3 Use cases – diagram



3.1 Use case number 1 (Description of the use case)

Actors: Teacher

Description: Add a student

Precondition: User gives data for a student

Postcondition: If student is valid, then it is added to student list.

User action	System response
1 Completes the necessary fields for adding	
	2 Checks if everything is all right. Adds the student if it is ok or displays an error message otherwise. Then it returns to menu

Exceptions: When the fields aren't filled, id already exists, one of the fields has an invalid data type.

3.2 Use case number 2 (Description of the use case)

Actors: Teacher

Description: Edit a student

Precondition: User gives the id and the fields he wants to modify

Postcondition: If student with that id exists, then its data is updated

User action	System response
1 Completes the necessary fields for updating	
	2 Checks if student exists. If so, it updates it, otherwise it displays an error. Then it returns to menu

Exceptions: Student with that id doesn't exist, one of the fields has an invalid data type.

3.3 Use case number 3 (Description of the use case)

Actors: Teacher

Description: Delete a student

Precondition: User gives the id

Postcondition: If student with that id exists, then it is removed from the students list

User action	System response
1 Inputs the id	
	2 Checks if student exists. If so, it deletes it, otherwise it displays an error. Then it returns to menu

Exceptions: Student with that id doesn't exist.

3.4 Use case number 4 (Description of the use case)

Actors: Teacher

Description: Print all students

Precondition: -

Postcondition: -

User action	System response
1	
	2 Prints all students. If there are no students, print an informative message. Then it returns to menu

3.5 Use case number 5 (Description of the use case)

Actors: Teacher

Description: Print all laboratory assignments

Precondition: -

Postcondition: -

User action	System response
1	
	2 Prints all assignments, If there are no assingments, print an informative message Then it returns to menu

3.6 Use case number 6 (Description of the use case)

Actors: Teacher

Description: Assign a lab theme to a student.

Precondition: User gives theme and student

Postcondition: Theme is assigned to student

User action	System response
1 Completes info about student and theme	
	2 If the user and the given theme exist, it assigns the theme to the student. Otherwise, it displays an error. Then it returns to menu

Exceptions: When student or assignment doesn't exist.

3.7 Use case number 7 (Description of the use case)

Actors: Teacher

Description: Add a lab theme

Precondition: User gives information about theme

Postcondition: Theme is added

User action	System response
1 Completes the necessary fields for adding	
	2 Checks if everything is all right. Adds the theme if it is ok or displays an error message otherwise. Then it returns to menu

Exceptions: When the fields aren't filled, id already exists, one of the fields has an invalid data type.

3.8 Use case number 8 (Description of the use case)

Actors: Teacher

Description: Grade a student's assignment

Precondition: User gives student, assignment and grade

Postcondition: Grade is added for the given student on the given theme

User action	System response
1 Completes the necessary fields	
	2 Checks if the StudentID & AssignmentId exist & the Grade is valid and adds the grade for the given student on the given theme. Otherwise, display an error message. Then returns to menu

Exceptions: When the fields aren't filled, StudentID & AssignmentId don't exist, Grade is not valid.

3.9 Use case number 9 (Description of the use case)

Actors: Teacher

Description: Filter the students, assignments, themes and grades based on different criteria

Precondition: -

Postcondition: -

User action	System response
1 Completes the necessary fields	
	2 Returns the result set of the selected filter. If there are no students / assignments / grades, print an informative message. Then returns to menu

3.10 Use case number 10 (Description of the use case)

Actors: Teacher

Description: Generate reports based on student grades, laboratories, assignments

Precondition: -

Postcondition: -

User action	System response
1 Completes the necessary fields	
	2 Shows the corresponding report

4 Analysis

4.1 Entities

- Student
- Laboratory assignments
- Grades

4.2 Relations between entities

A student can have more assignments and an assignment can be assigned to more students.

A grade can be given for a specific student on an assignment.

4.3 Attributes

- Student
  - id: String
  - name: String
  - group: Int
  - email: String
  - teacher: String
- Grade

  - id: Map<String, Int>
  - st: Student
  - assign: Assignment
  - value: Float
  - date: Int
- Assignment
  - id: Int
  - description: String
  - deadline: Int
  - delivery_week: Int

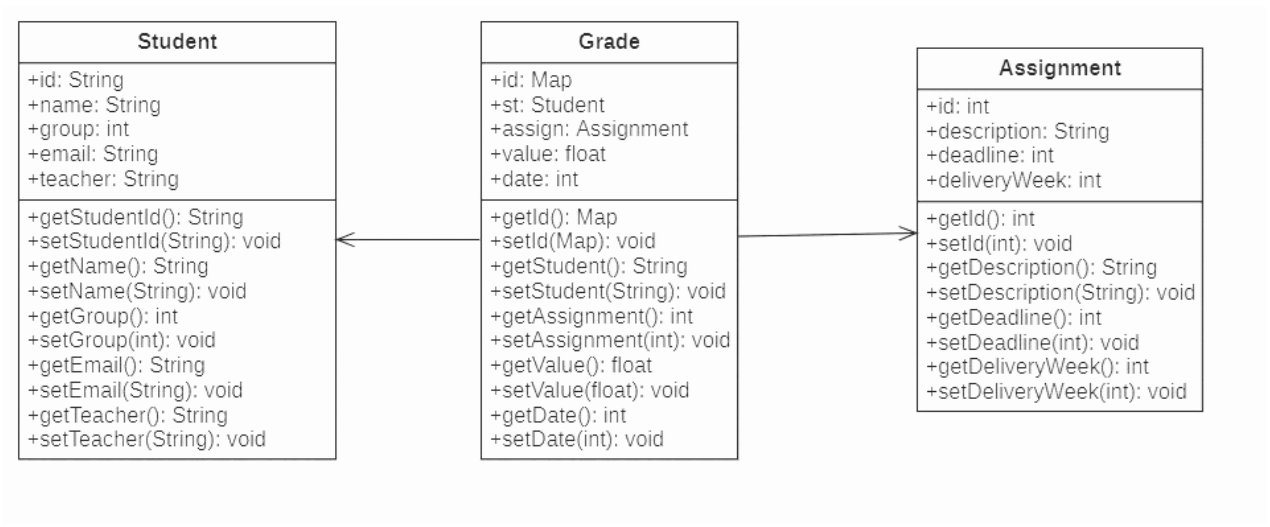
4.4 System behavior

4.4.1 Use case 1-2-3

The system will probably act as a subsystem to a larger environment, in order to speed up a certain process in the company's workflow.

5 Design

5.1 Class diagram



- All attributes of all 3 classes should be marked as private

- Think of implementing classic design patterns to efficiently solve the problem