Laboratory Assignment AND Assessment Requirements Specification

Version 1.0

March, 2020

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Version History

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| --- | --- | --- | --- |
| Version | Description of Change | Author | Date |
| V01 | Initial | Student Modolea Bogdan  Student Mihai Alexandru | 14.03.2024 |
| V02 | Completion of document | Student Modolea Bogdan  Student Mihai Alexandru | 14.03.2024 |

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**Analysis and design Document**

# Functional Requirements

List the functional requirements (FR) of the system.

|  |  |
| --- | --- |
| Section/ Requirement ID | Requirement Definition |
| FR1.0. | Add a new student |
| FR1.1 | Remove a student |
| FR1.1.1 | Update student |

# Actors

Teacher

# Use cases – diagram



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

Actors: teacher

Description: create a new student

Precondition: - all fields are specified; valid fields

Postcondition: - a new student was added in the list

|  |  |
| --- | --- |
| Action | System Response |
| 1 Completes the necessary fields for adding |  |
|  | 2 Checks if everything is alright, adds a new element in the list if so |
| 3 - | 3. If the input is invalid, throws an exception |

Exceptions: When the fields aren’t filled; id already exists; invalid field data

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

Actors: teacher

Description: delete student

Precondition: - valid id belonging to an existing student is specified

Postcondition: - the student with the specified id is removed from the list

|  |  |
| --- | --- |
| Action | System response |
| 1 Give an id as input |  |
|  | 2 Checks if it is a valid id and there is a student with that id and deletes the student |
| 3 - | 3. If the input is invalid, throws an exception |

Exceptions: Student id doesn’t exist or the id is not empty.

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

Actors: teacher

Description: update student

Precondition: - valid id belonging to an existing student and all other fields for student are specified and valid

Postcondition: - the student with the specified id has the data updated

|  |  |
| --- | --- |
| action | System response |
| 1 Give an id and all other fields for the Student entity as input |  |
|  | 2 Checks if it is a valid id and there is a student with that id, than checks if the rest of the input is valid, and updates the data for that student |
| 3 - | 3. If the input is invalid, throws an exception |

Exceptions: Student id doesn’t exist; one of the fields has an invalid data type; one of the fields is empty.

## 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 |
|  | 3. Return 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 |
|  | 3. Return 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 and both are valid

Postcondition: Theme is assigned to student

|  |  |
| --- | --- |
| User action | System response |
| 1 Completes info about student and theme |  |
|  | 2. Assign a theme to a student |
|  | 3. Return to menu |

Exceptions: When student or assignment doesn’t exist or the fields are empty.

## 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. Adds the theme |
|  | 3. Return to menu |

Exceptions: Fields are empty; id already exists; one of the fields is invalid.

## 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. Add grade for a student |
|  | 3. Return to menu |

Exceptions: Fields are empty; one of the fields is invalid.

## 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 |

# Analysis

## Entities

Student, Assignment, Grade

## Relations between entities

One student can have multiple assignments and one assignment can be assigned to many students. It is a many-to-many relationship between the two classes. Class Grade has as id, a pair consisting of studentId and assignmentId and it is the association class between the Student and Assignment classes.

## Attributes

Student: id, name, group, email, professor name

Assignment: id, description, deadline, assignation date

Grade: id(studentId, assignmentId), value, deliver date, feedback

## System behavior

## Use case 1-2-3

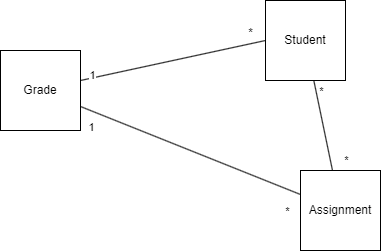
The system will act as a subsystem to a larger environment, in order to speed up a certain process in the company’s workflow.

## System events

After each operation a message is shown to the user either if the command terminated succesfully or with an error message.

# Design

* 1. **Class diagram**

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* 1. **Sequence diagrams (for each use case)**
* **Add Student Sequence Diagram**

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* **Delete Student Sequence Diagram**

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* **Update Student Sequence Diagram**

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* 1. **GRASP**

GRASP is set of exactly 9 **G**eneral **R**esponsibility **A**ssignment **S**oftware **P**atterns:

1. Information Expert

2. Creator

3. Controller

4. Low Coupling

5. High Cohesion

6. Indirection

7. Polymorphism

8. Pure Fabrication

9. Protected Variations