FACULTY OF COMPUTERS, INFORMATICS AND MICROELECTRONICS

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OBJECT-ORIENTED MODELING AND ANALYSIS

LABORATORY WORK #6

Modeling your project with Statechart Diagrams. Domain Analysis. SOLID / GRASP Prin- ciples.

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Laboratory work #6

1 Tasks

– Model your application using 3 Statechart Diagrams;

– Perform the Domain analysis of your project.

2 Theory

2.1 SOLID / GRASP Principles.

SOLID Principles are principles of class design.

– SRP: Single Responsibility Principle–An object should have only a single responsibility and all the responsibility should be entirely encapsulated by the class.–There should never be more than one reason for a class to change

– OCP: Open/Closed Principle–Software entities should be open for extension, but closed for modification

– LSP: Liskov Substituion Principle–Objects in a program should be replaceable with instances of their subtypes without altering the correctness of that program

– ISP: Interface Segregation Principle–many client specific interfaces are better than one general purpose interface–once an interface has gotten too 'fat' split it into smaller and more specific interfaces so that any clients of the interface will only know about the methods that pertain to them. No client should be forced to depend on methods it does not use

– DIP: Dependency Inversion Principle–Depend upon Abstractions. Do not depend upon concretions.Dependency Injection (DI) is one method of following this principle.

GRASP - Acronym for General Responsibility Assignment Software Patterns.

– Assigning responsibilities to classes is a critical aspect of object-oriented design.

– Appropriate assignment of responsibilities to classes is the key to successful design.

– There are fundamental principles in assigning responsibilities that experienced designers apply.

– These principles are summarized in the GRASP patterns.

– Has nine core principles that object-oriented designers apply when assigning responsibilities to classes and designing message interactions.

3 Statechart Diagrams

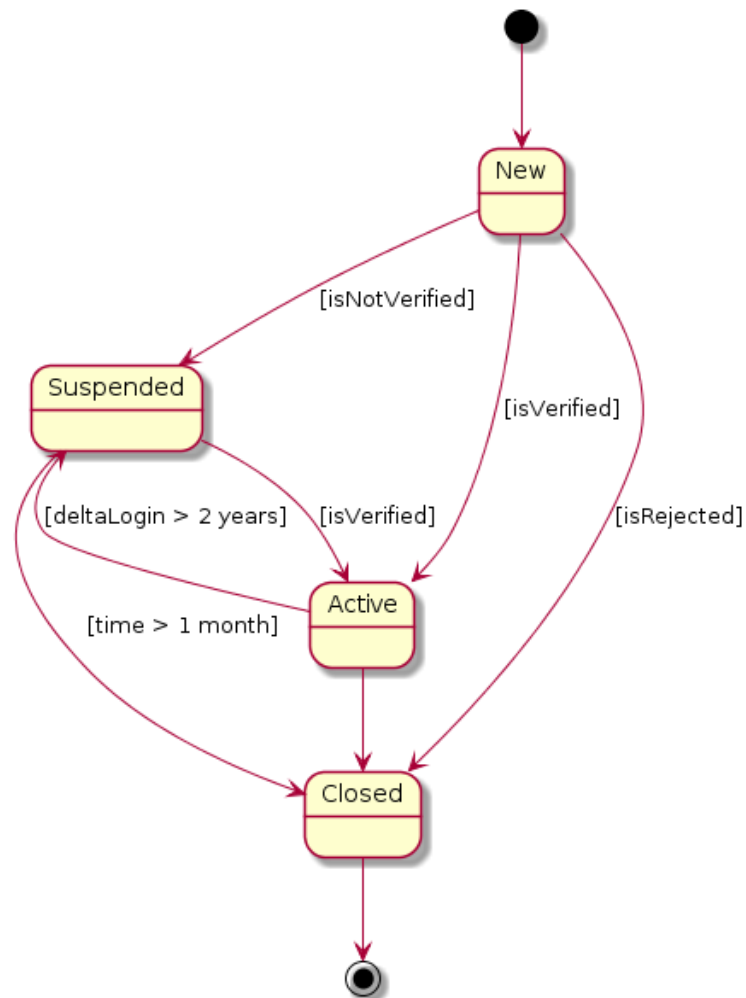In Figure 3.1 is represented the statechart diagram for the user account.

Figure 3.1 – User account statechart diagram

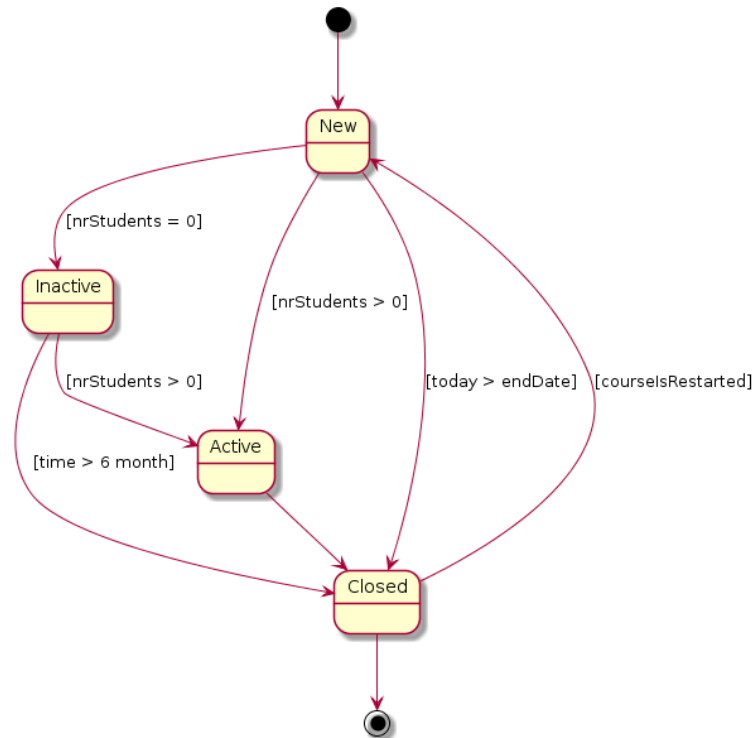In Figure 3.2 is represented the statechart diagram for courses.

Figure 3.2 – Courses statechart diagram

In Figure 3.3 is represented the statechart diagram for searching a course.
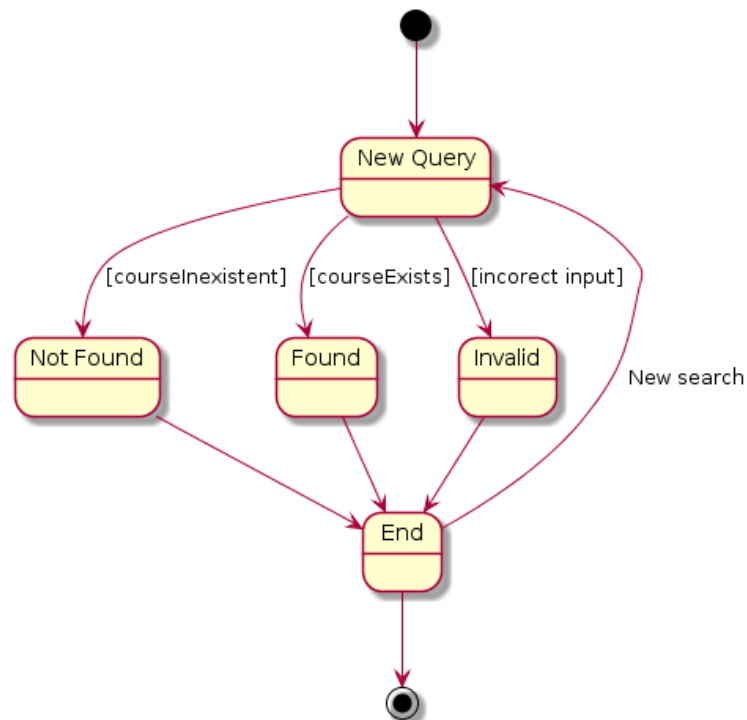

Figure 3.3 – Search operation statechart diagram

4   Domain analysis

Online courses are aimed at unlimited participation and open access via the web. In addition to traditional course materials such as filmed lectures, readings, and problem sets, many online courses

provide interactive user forums to support community interactions among students, professors, and teaching assistants (TAs).

Online courses are regarded by many as an important tool to widen access to Higher Education (HE) for millions of people, including those in the developing world, and ultimately enhance their quality of life. Online courses may be regarded as contributing to the democratisation of HE, not only locally or regionally but globally as well. Online courses can help democratise content and make knowledge reachable for everyone. Students are able to access complete courses offered by universities all over the world, something previously unattainable. With the availability of affordable technologies, online courses increase access to an extraordinary number of courses offered by world-renowned institutions and teachers.

There are already similar platforms. "Coursera" emerged as the top ranked online courses platform and the best overall choice due to its impressive selection of learning pathways and course features. "edX" and "Udacity" were also found to be strong contenders.

5   Conclusion

In this laboratory work we learned to create statechart diagrams and perform domain analysis.