Faculty of Computers, Informatics and Microelectronics

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AMSI

Laboratory work #1

Project description.
Entities and relations in UML.

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Laboratory Work №1

Topic:

Project description. Entities and relations in UML.

Tasks:

- Describe in your own words what are entities and relations in UML and shortly describe each;

- Describe your project;

Tips:

- The entity / relation description will probably go into the "Theory" part of the report;

- If you are part of a team, your "Task" part, the description of the project, should also be personalized - try to focus on the part of the project you're responsible for;

Good Luck!

1 Entities and relations in UML.

The **Unified Modeling Language** is a widely accepted language used by analysts and software developers that is an excellent fit for the graphic representation of **Entity Relationship Diagrams**.

An **Entity Relationship Diagram** is a representation of data within a domain. It consists of entities as well as relationships between entities.

The are four elements of Entities:

- Structural

- Behavioral

- Grouping

- Annotational

Structural Entities define the static part of the model. They represent the physical and conceptual elements.

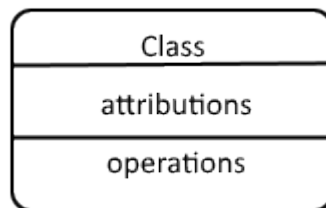a) **Class** - defines a set of objects having similar attributes and methods.

Figure 1.1 – Class

Attributions of a class can be:

- public: +
- private: -
- protected: #

b) **Interface** - defines a set of operations, which specify the responsibility of a class.

Figure 1.2 – Interface

c) **Collaboration** - defines an interaction between elements.

Figure 1.3– Collaboration

d) **Use case** - represents a set of actions performed by a system for a specific goal.
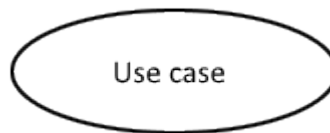

Figure 1.4– Use Case

e) **Active class** - are the classes who's objects are already used in processes or threads. Graphically it is the same class

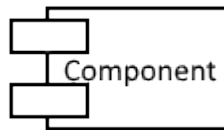f) **Component** describes the physical part of a system.

Figure 1.5– Component

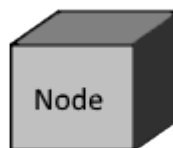g) **Node** - can be defined as a physical element that exists at run time.

Figure 1.6– Node

While their operations/methods distinctive to their cases.

Behavioral entities are dynamic parts of the UML model.

a) **Interaction** - is defined as a behavior that consists of a group of messages exchanged among elements to accomplish a specific task.
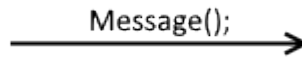
Figure 1.7 – Message

b) **State machine(Automata)** - used when the state of an object in its life cycle is important. It defines the sequence of states an object goes through in response to events. Events are external factors responsible for state change.
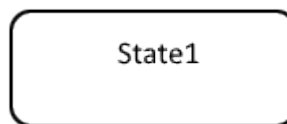
Figure 1.8 – States

Grouping - defined as a mechanism to group elements of a UML model together

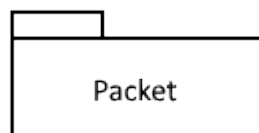a) **Package** - the only one grouping entity available for gathering structural and behavioral entities.

Figure 1.9 – Package

Annotational Annotational entities can be defined as a mechanism to capture remarks, descriptions, and comments of UML model elements.
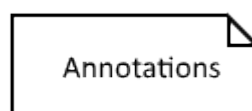
Figure 1.10 – Annotation

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2   Project description.

The **Tracking System** is a multipurpose tracking system which can help in tracking the data on a computer.This can be used in various ways like History based tracking in case the user had an important work that he would want to remember each step done for offline working routine, or in case of an organization to supervise the work of its employees. When the soft is initialized it opens up in offline mode and has interface methods to extend to an online mode which can add the ID's of the other users in order to create an Admin Supervisor.The Admin supervisor has control over all the options in whole group. The Interface of the Tracking system contains various additional options in order to be able to create new tracking methods and filter the final data in form of Report for a filtered method. The filtered method can create or import methods for data filtering. The tracking methods can be chosen in a checkbox form.The default tracking methods will contain Keyboard type tracking,Mouse tracking,Upload/Download data track and a low quality(for fast data transmition) screenshot during a chosen time interval and/or activity.More tracking methods can be further added in the system, in of themselves the tracking methods are mini systems made to work on specific tasks.
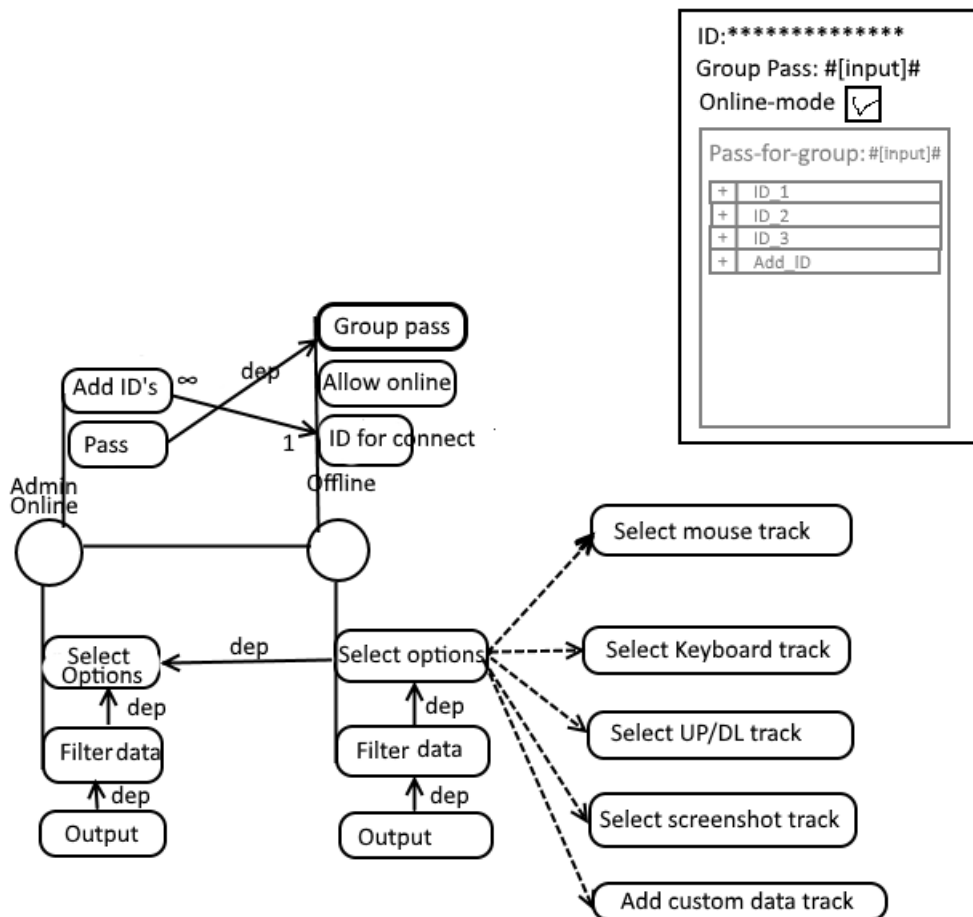

Figure 2.1 – example

Conclusions

I learned that "The Unified Modeling Language (UML) is a graphical language for visualizing" ,it helps in creating well thought projects. It supports further development of that project, by simply showing up what it does, how how it is made and for what purpose.

References

1 Learn Unified Model Language,`https://www.tutorialspoint.com/uml/`

2 Wikipedia,`https://en.wikipedia.org/wiki/Unified_Modeling_Language`

3 Notes on UML course given by professor and laboratory assistant.