

Domain Model and UML Class diagram

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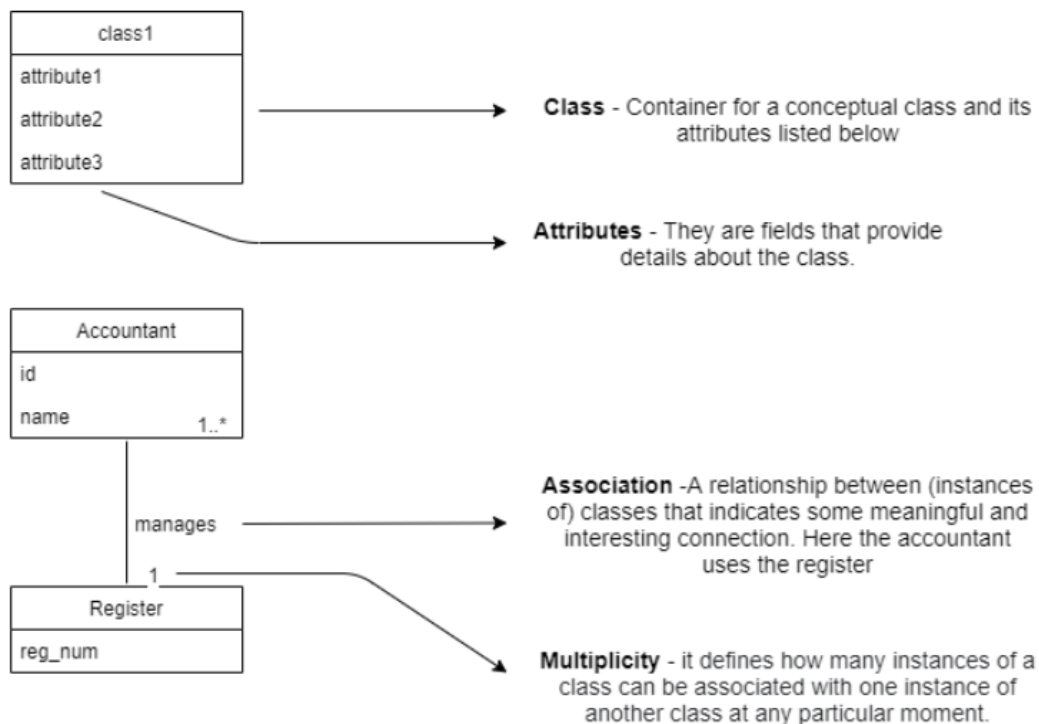
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Aim

Creation of an UML domain model for chosen problem domain.

UML Notations for domain model



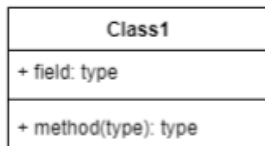
Multiplicity

1 (number) - Indicates a specific value (1 in this example).

*** (asterisk)** - Indicates any number (even 0).

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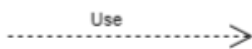
UML Notations for Class diagram



Class - The top section is used to name the class.

The second one is used to show the attributes of the class.

The third section is used to describe the operations performed by the class.



Dependency - used to represent the dependency between two elements of a system



Association - used to represent the relationship between two elements of a system.



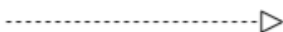
Generalization - used to describe parent-child relationship of two elements of a system.



Aggregation - implies a relationship where the child can exist independently of the parent



Composition - implies a relationship where the child cannot exist independent of the parent.



Implementation - The class implements the operations and attributes defined by the interface.

Identification of classes

A) Conceptual class list

Conceptual class category	Identified classes
Physical or tangible objects	Classroom

Roles of people	Student, Teacher, Admin
Containers of things	Classroom
Things in a container	Student, Teacher
Processes	Authentication, Record Attendance, Calculate class average, Generate metrics
Records of finance, work , legal matter	AttendanceLog

B) Identification of noun phrases

Main success scenario:

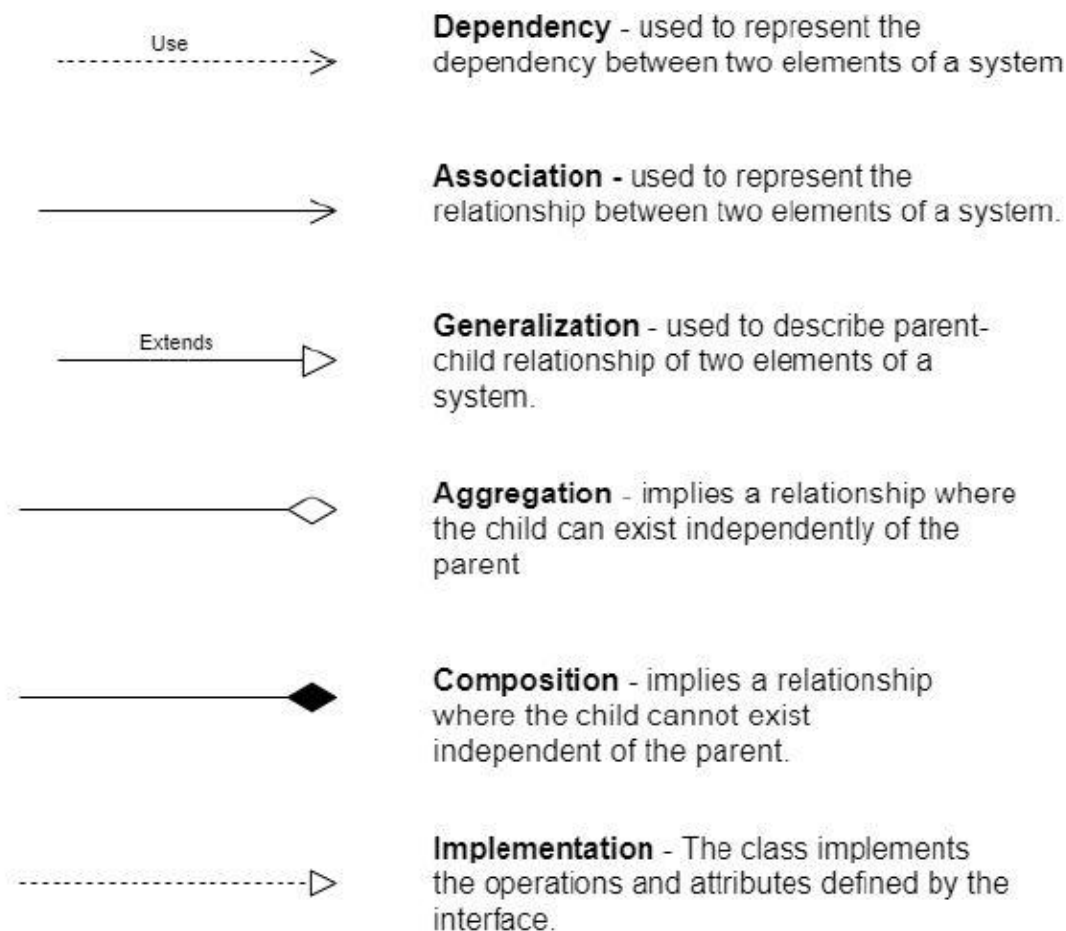
- 1) **User** logs into the system and is **authenticated** successfully.
- 2) **Teachers** and managers are able to access each of their **students/** employees' performance. **Students** and employees are able to see their personal **attendance record**.
- 3) **Students** are able to compare their **attendance** with the entire class average. Managers and **teachers** are able to see each individual student's performance.
- 4) **Teachers**/managers are able to run **statistical inferences and graphs** from the data that has been collected by the system.
- 5) **Teachers**/managers are also able to edit/upload the **timetable** that corresponds to their class.

Extensions:

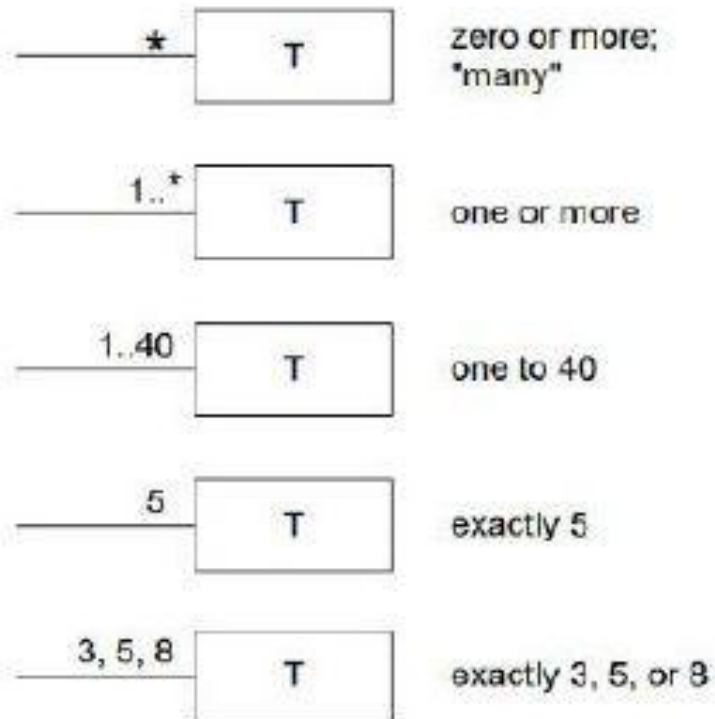
- 1) The **user** logs into the system:
 - a) Invalid username or password: **User** is shown that either username or password is invalid and are asked to re-enter them.
- 2) **Students**/employees are able to view individual **attendance** performance and class average.
- 3) **Teachers**/managers are able to view the individual performance of each **student**/employee as well as class average.

- 4) Teachers/Employees are given access to various **statistical inferences and graphs** about the **class'** attendance record.
 - a) If the data is not enough/problematic appropriate error message is shown next to the particular calculation that has resulted in an error.
- 5) **Teachers**/Employees are able to upload/edit **timetable** of the **class** that they are given access to.
 - a) If the hours clash when a **teacher** uploads their **timetable** for the **classroom** an error message is shown and they are made to re-enter the value.

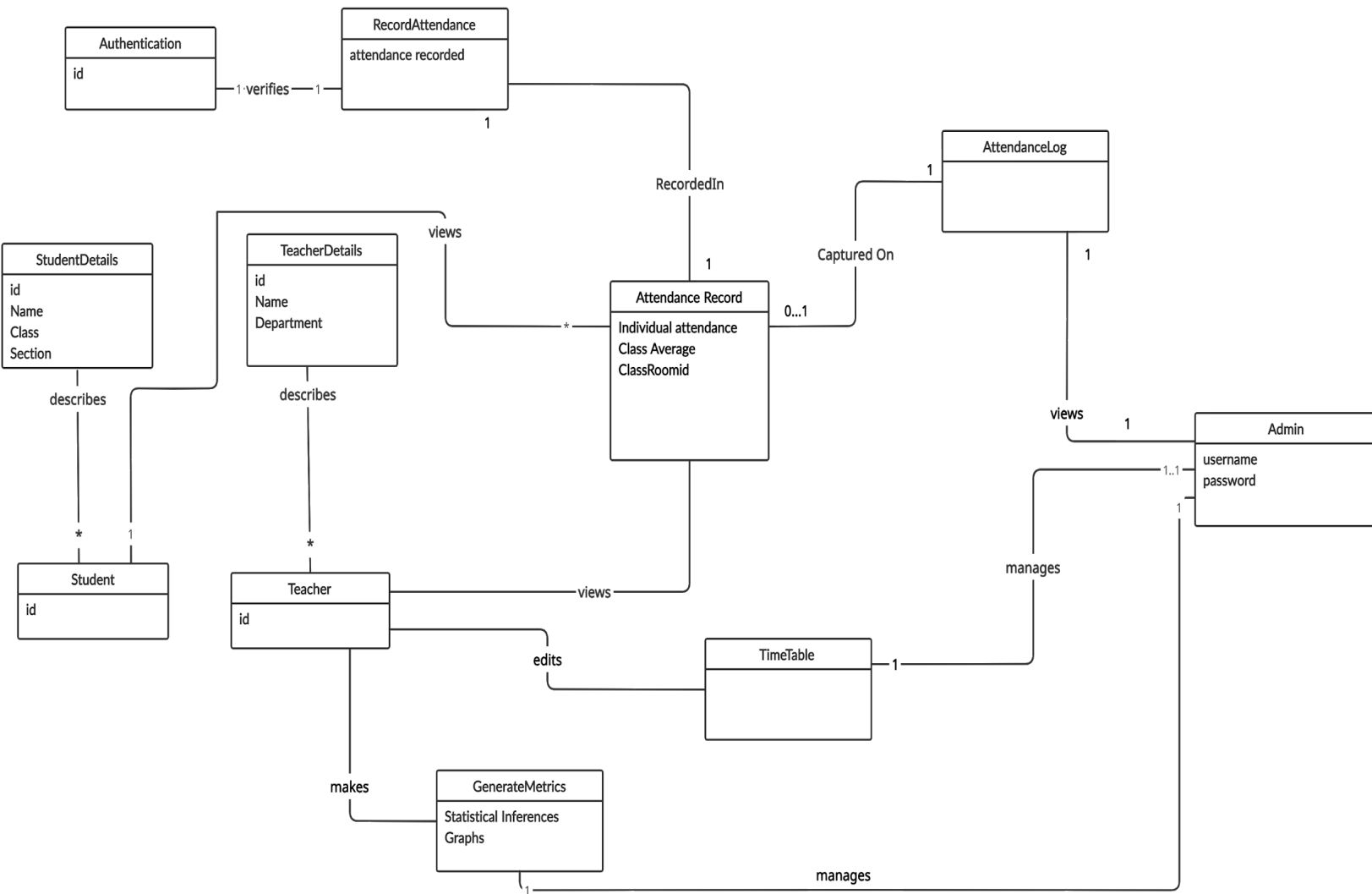
Identification of Associations:



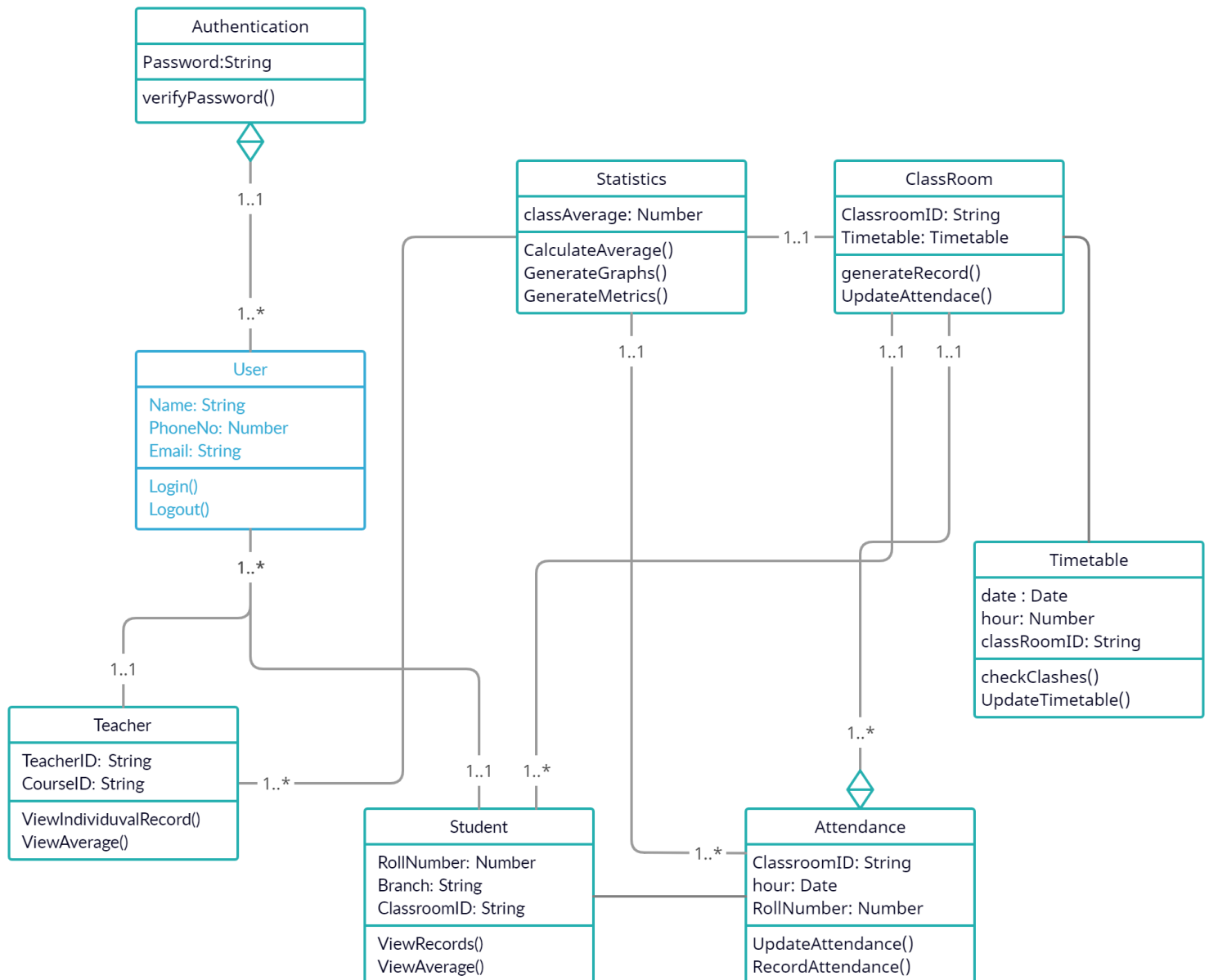
Multiplicity:



Domain Model Diagram:



Class Diagram:



Documentation:

The main purpose of this document is to verify the main classes of the system.

The domain model is used to identify the various classes and the associations between classes.

The class diagram is used to identify the classes, their attributes and their functions. The associations between the classes are also identified.

These models give a better understanding of various domains of The Automated Attendance Management System and its features.