Object-Oriented Thinking Practice.
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Requirements for the system
Functional
The system must...
- check the current status of the printer (available, in use, out of service, etc)
- schedule a period of time in advance as a reservation
- be able to cancel a reservation
- be able to modify a reservation
- authenticate users, and allow operations according to access rights for group of users
- generate reports about the usage statistics

Non-Functional
The system should be...
- available 24/7
- able to handle large number of users and printers without lossing perfomance
- protect against unauthorized access to user information and their usage of the printers
- easy to use and understand, with a modern and good-looking interface
- compatible with the authorized OSes the university uses, Windows and Linux

Use cases

Title: Check printers status
Primary Actor: Authenticated user
Success Scenario: User asks for list of available printers. System display a list of the available printers.

Title: Reserve a printer
Primary Actor: Authenticated user
Success Scenario: User check printers status. User select printer. User reserve the printer. If the printer will not be available for that period, System suggest new period. User tries until get a succeful reservation or abort the reservation.

Title: Cancel reservation
Primary Actor: Authenticated user
Success Scenario: User acces to their reservation. User cancel reservation.

Title: Modify reservation
Primary Actor: Authenticated user
Success Scenario: User acces to their reservation. User modify reservation.

Title: Authenticate users
Primary Actor: User
Success Scenario: User access the system. System asks for credentials. User input their credentials. System verify valid credential and gran access according.

Title: Track usage statistics
Primary Actor: Administrator
Success Scenario: An user for the group administrators log in. User can check how many prints have been made in a particular printer over a certain period of time, how much paper has been used, etc. System provides this information in the display, and also allows to print it to paper.

Objects, classes, and relationships

Objects
- Printer: Represents a physical printer that is available for use by authorized users.
- Reservation: Represents a time period during which a printer has been reserved for a specific user.
- User: Represents a student, teacher or administrator who is using the system.

Classes
- Printer: Defines the attributes and behaviors for a printer, like its location, model, id and current status.
- Reservation: Defines the attributes and behaviors of a reservation, such as the start and end time, the user who made the reservation, and the printer being reserved.
- User: Defines the attributes and behaviors of a user, such as their name, email address and authentication credentials.

Relationships
- A Printer can have many Reservations.
- A Reservation has a single Printer.
- A Reservation has a single User and Printer.

- An user can have many groups.

Class diagrams

Printer
- location - model - status
+ checkStatus() + reserve()

Reservation
- startTime - endTime - user - printer
+ cancel() + modify()

User
- name - email - password - Group
+ authenticate() + updateUser()