Campus Insider

COS 457

Requirements

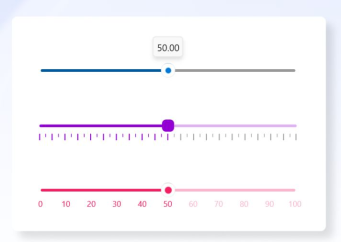
Functional

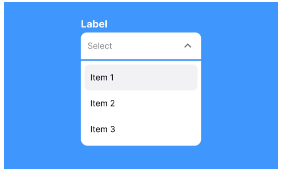
- User Authentication
    - register and login w/ username and password. Only logged in users can rate.
- View Campus Locations and Rooms
    - Browse buildings, open spaces, rooms
    - Location info (name, type, images, avg. rating)
- Submit Ratings
    - Noise, cleanliness, accessibility, wifi strength
    - Users can view all ratings they’ve submitted
- Admin Tools
    - Manage tags to track student feedback for use in advertising, improvement, etc.

Requirements (Cont.)

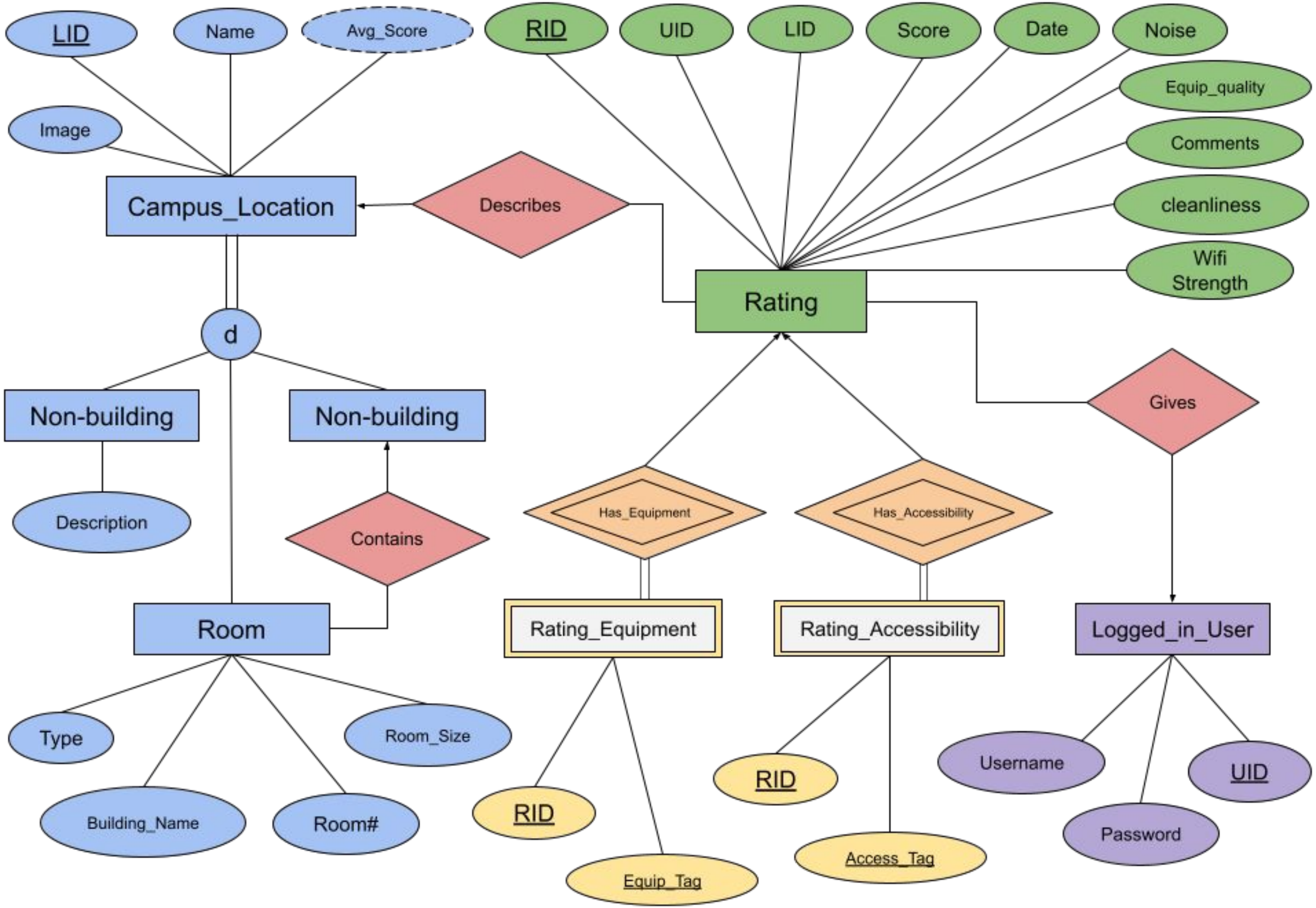
Non-Functional

- Performance and Scalability
  - Support many users concurrently
  - Fast query response time
  - Easily add new room types, locations, and categories
- Security and Data Integrity
  - Only authenticated users can post/rate/edit
  - Input validations and constraints
  - Rate by noise, cleanliness, wi-fi, etc.
- Usability
  - Interface should be intuitive and mobile responsive
  - Ratings should be quick and easy to submit with guided dropdowns and sliders
- Stakeholder Insights
  - Admin wants to track feedback, use curated tags to find patterns, popularity, etc.
  - Students want a way to find quiet or accessible places to study quickly



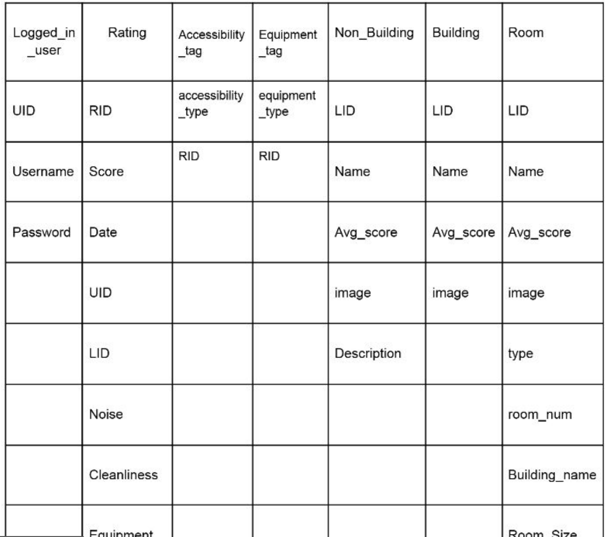


ER Diagram

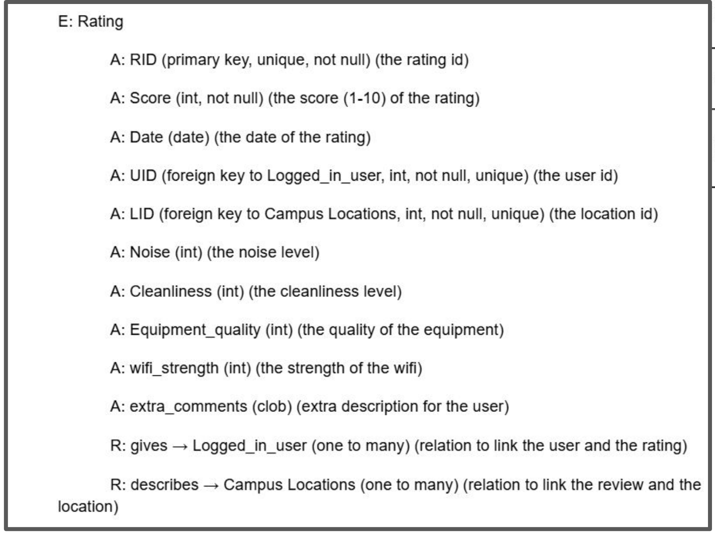

LID
Name
Avg_Score
Image
Campus_Location
Describes
d
Non-building
Non-building
Description
Contains
Room
Type
Building_Name
Room#
Room_Size
RID
UID
LID
Score
Date
Noise
Equip_quality
Comments
cleanliness
Wifi Strength
Rating
Gives
Has_Equipment
Has_Accessibility
Rating_Equipment
Rating_Accessibility
Logged_in_User
RID
Equip_Tag
RID
Access_Tag
Username
Password
UID

Data Dictionary: Rating example

- Int used for quantitative attributes like noise level
- Special data types use for qualifying attributes (clob for text, date for the date)
- Keys are non null, unique integers



Logged_in_user	Rating	Accessibility_tag	Equipment_tag	Non_Building	Building	Room
UID	RID	accessibility_type	equipment_type	LID	LID	LID
Username	Score	RID	RID	Name	Name	Name
Password	Date			Avg_score	Avg_score	Avg_score
	UID			image	image	image
	LID			Description		type
	Noise					room_num
	Cleanliness					Building_name
	Equipment_quality					Room_Size
	wifi_strength					
	extra_comments					



E: Rating

A: RID (primary key, unique, not null) (the rating id)

A: Score (int, not null) (the score (1-10) of the rating)

A: Date (date) (the date of the rating)

A: UID (foreign key to Logged_in_user, int, not null, unique) (the user id)

A: LID (foreign key to Campus Locations, int, not null, unique) (the location id)

A: Noise (int) (the noise level)

A: Cleanliness (int) (the cleanliness level)

A: Equipment_quality (int) (the quality of the equipment)

A: wifi_strength (int) (the strength of the wifi)

A: extra_comments (clob) (extra description for the user)

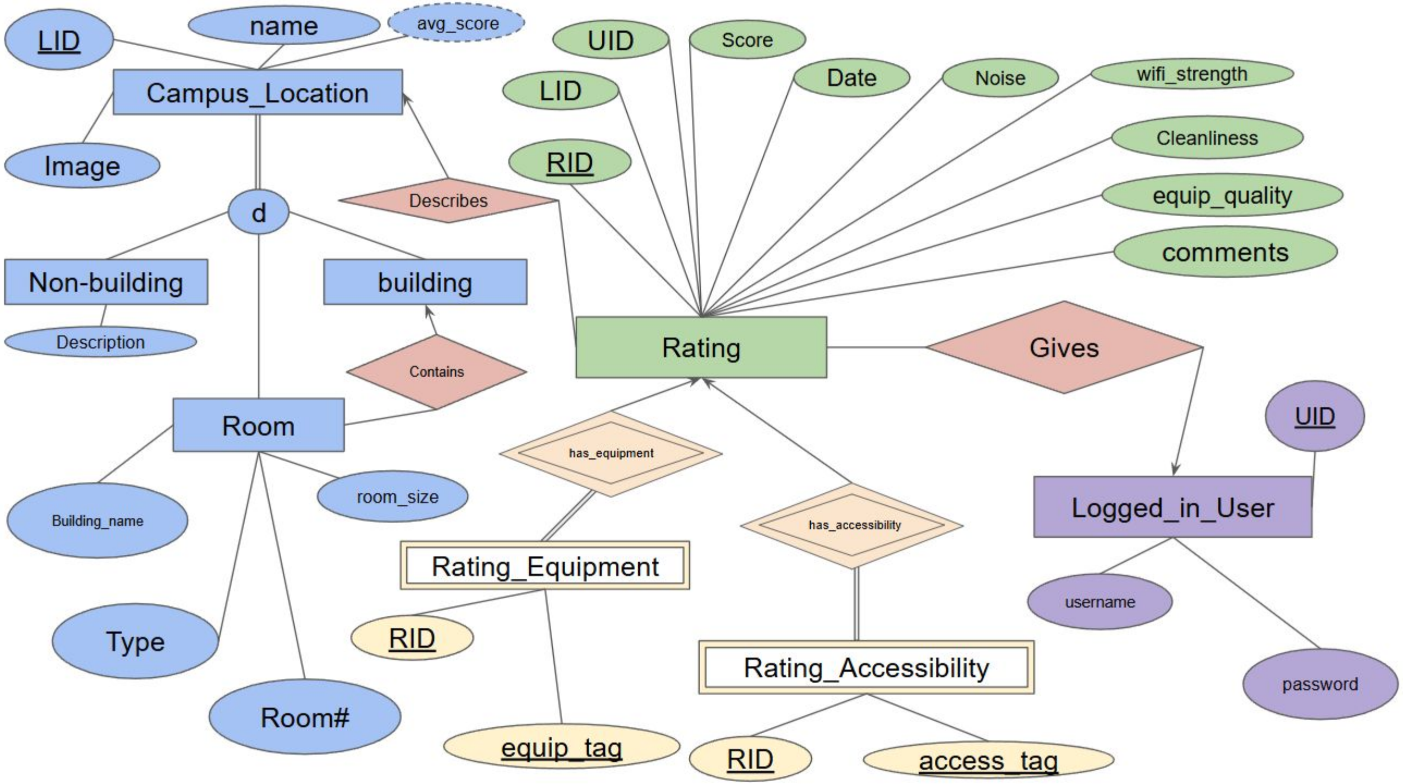
R: gives → Logged_in_user (one to many) (relation to link the user and the rating)

R: describes → Campus Locations (one to many) (relation to link the review and the location)

Normal Form Summary - 5NF

- The highest form this database design satisfies is Fifth Normal Form (5NF)
    - Requirements for 5NF:
        - Must be 4NF
        - Can’t contain non-trivial join dependencies not implied by candidate keys
            - Should be able to reconstruct database from a join between all tables off of their primary keys
- Rating:
    - RID → LID, UID, Score…
- Campus_Location:
    - LID → name, image…
- Logged_in_User:
    - UID → username, password
- This design satisfies BCNF ✓

- Originally had multivalued attributes under Rating for equipment and accessibility tags.
- These were decomposed into two separate tables (rating_equipment & rating_accessibility)
- With this, we achieve 4NF, and thus 5NF


LID
name
avg_score
Campus_Location
Image
d
Describes
Non-building
building
Description
Contains
Room
Building_name
room_size
Type
Room#
UID
Score
LID
Date
Noise
wifi_strength
RID
Cleanliness
equip_quality
comments
Rating
Gives
has_equipment
has_accessibility
UID
Logged_in_User
Rating_Equipment
RID
equip_tag
Rating_Accessibility
RID
access_tag
username
password