PRAC 2

Software Engineering

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Self-Responsibility Declaration

> I understand that plagiarism, the use of AI or other generated content will imply that the delivered work will not be reviewed and it will be automatically assigned a grade of D. I certify that I have completed the PRAC2 individually and only with the help that the professors of this subject considered appropriate, according to the FAQs about plagiarism.

Tip

All diagrams from this practice have been generated using mermaid.js or plantuml.

Question 1

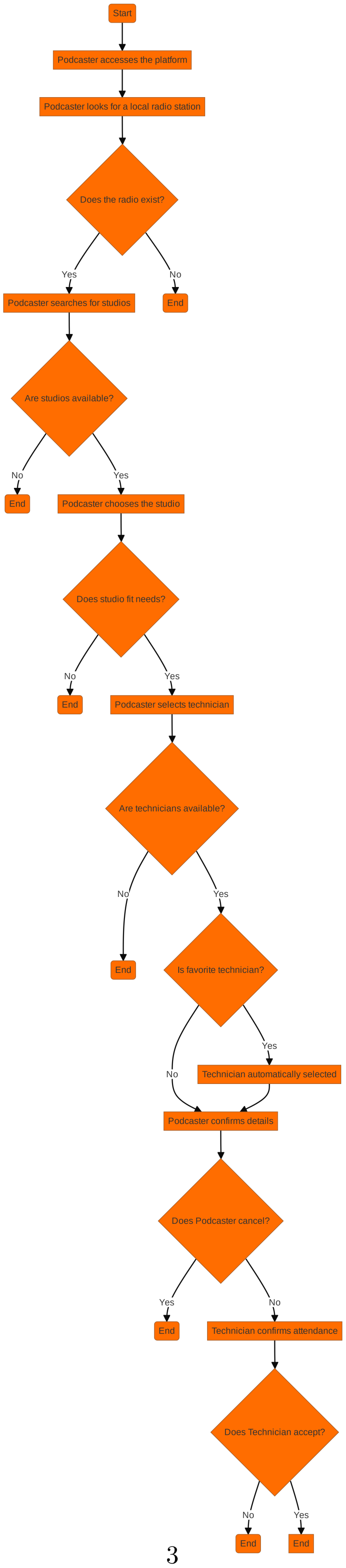

Start
Podcaster accesses the platform
Podcaster looks for a local radio station
Does the radio exist?
Yes
No
Podcaster searches for studios
End
Are studios available?
No
Yes
End
Podcaster chooses the studio
Does studio fit needs?
No
Yes
End
Podcaster selects technician
Are technicians available?
No
Yes
End
Is favorite technician?
Yes
No
Technician automatically selected
Podcaster confirms details
Does Podcaster cancel?
Yes
No
End
Technician confirms attendance
Does Technician accept?
No
Yes
End
End

Figure 1: Activity Diagram

Question 2

Additional Use Case

Global Administrator

Use Case Identifier: Define Minimum Rental Price for Studios

Main Actor: Global Administrator

Supporting Actors: None

Level: Strategic

Scope: Organization

Main Success Scenario:

1. The global administrator accesses the platform.
2. The global administrator navigates to the pricing management section.
3. The global administrator selects the option to define minimum rental prices.
4. The global administrator inputs the minimum prices for different studio sizes.
5. The global administrator saves the changes.
6. The system confirms the changes.
7. The use case ends.

Alternative Scenarios:

4a. The input prices are below the allowed minimum. 4a1. The system displays an error message. 4a2. The use case returns to step 4.

Local Administrator

Use Case Identifier: Manage Studio Availability

Main Actor: Local Administrator

Supporting Actors: None

Level: Operational

Scope: Local Radio Station

Main Success Scenario:

1. The local administrator logs into the platform.
2. The local administrator navigates to the studio management section.
3. The local administrator updates the availability of studios, including enabling or disabling specific studios.
4. The local administrator updates the time slots for each studio.
5. The local administrator applies a margin to the rental price.

6. The local administrator saves the changes.
7. The system confirms the updates.
8. The use case ends.

Alternative Scenarios:

3a. No changes are made to the studio availability.

3a1. The local administrator exits without saving.

3a2. The use case ends.

Technician

Use Case Identifier: Register as an Independent Technician

Main Actor: Technician

Supporting Actors: None

Level: Operational

Scope: Platform

Main Success Scenario:

1. The technician accesses the platform.
2. The technician navigates to the registration section.
3. The technician fills out the registration form with personal details, qualifications, and availability.
4. The technician submits the registration form.
5. The system validates the information and confirms the registration.
6. The use case ends.

Alternative Scenarios:

4a. The information is incomplete or incorrect.

4a1. The system displays an error message.

4a2. The use case returns to step 3.

Anonymous User

Use Case Identifier: Browse Available Studios

Main Actor: Anonymous User

Supporting Actors: None

Level: Informational

Scope: Platform

Main Success Scenario:

1. The anonymous user accesses the platform.
2. The anonymous user navigates to the browse section.
3. The anonymous user selects a date and time to check studio availability.
4. The system displays available studios for the selected time.
5. The use case ends.

Alternative Scenarios:

4a. No studios are available for the selected time.

4a1. The system informs the user.

4a2. The use case ends.

Use Case Diagrams

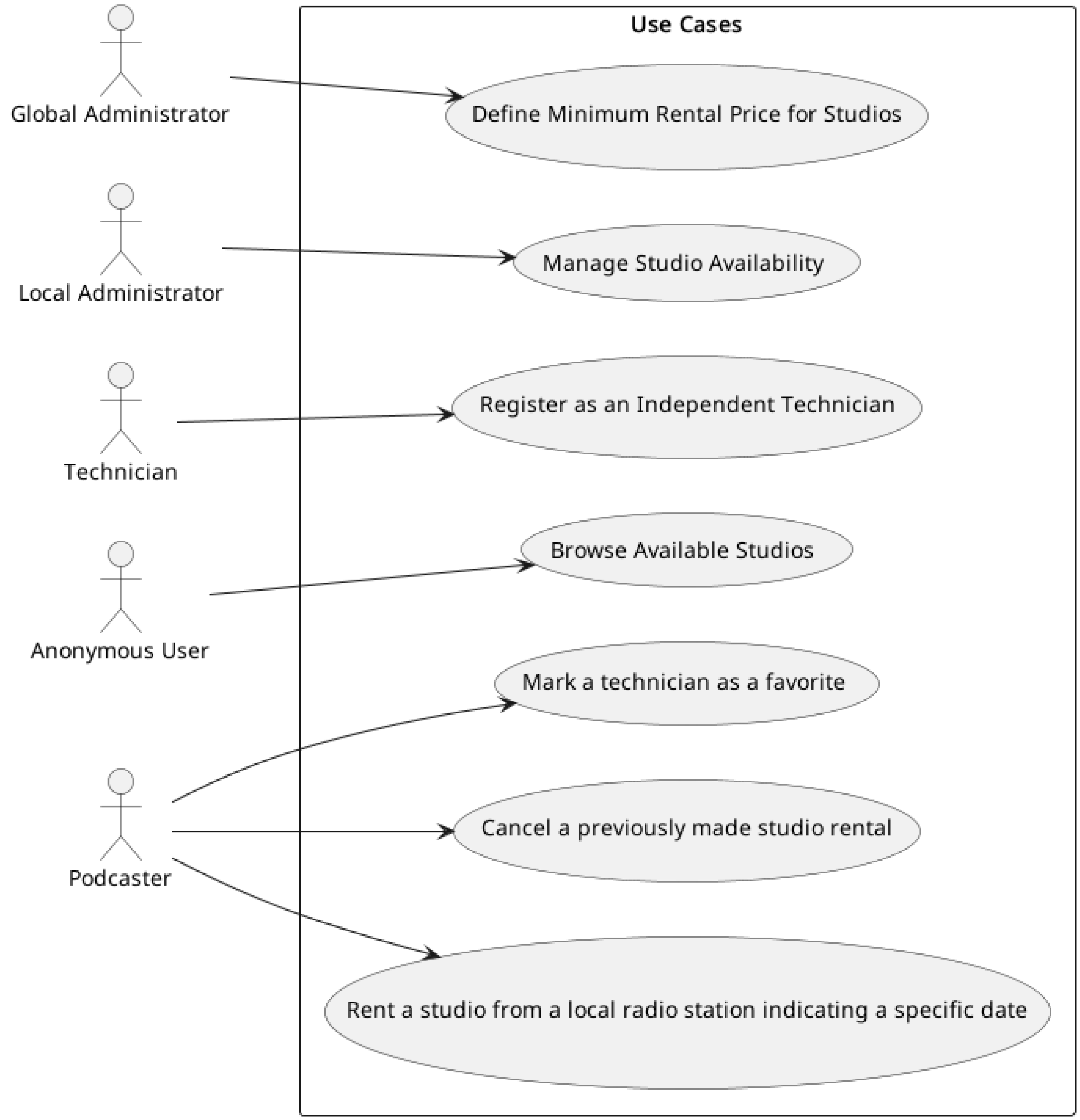
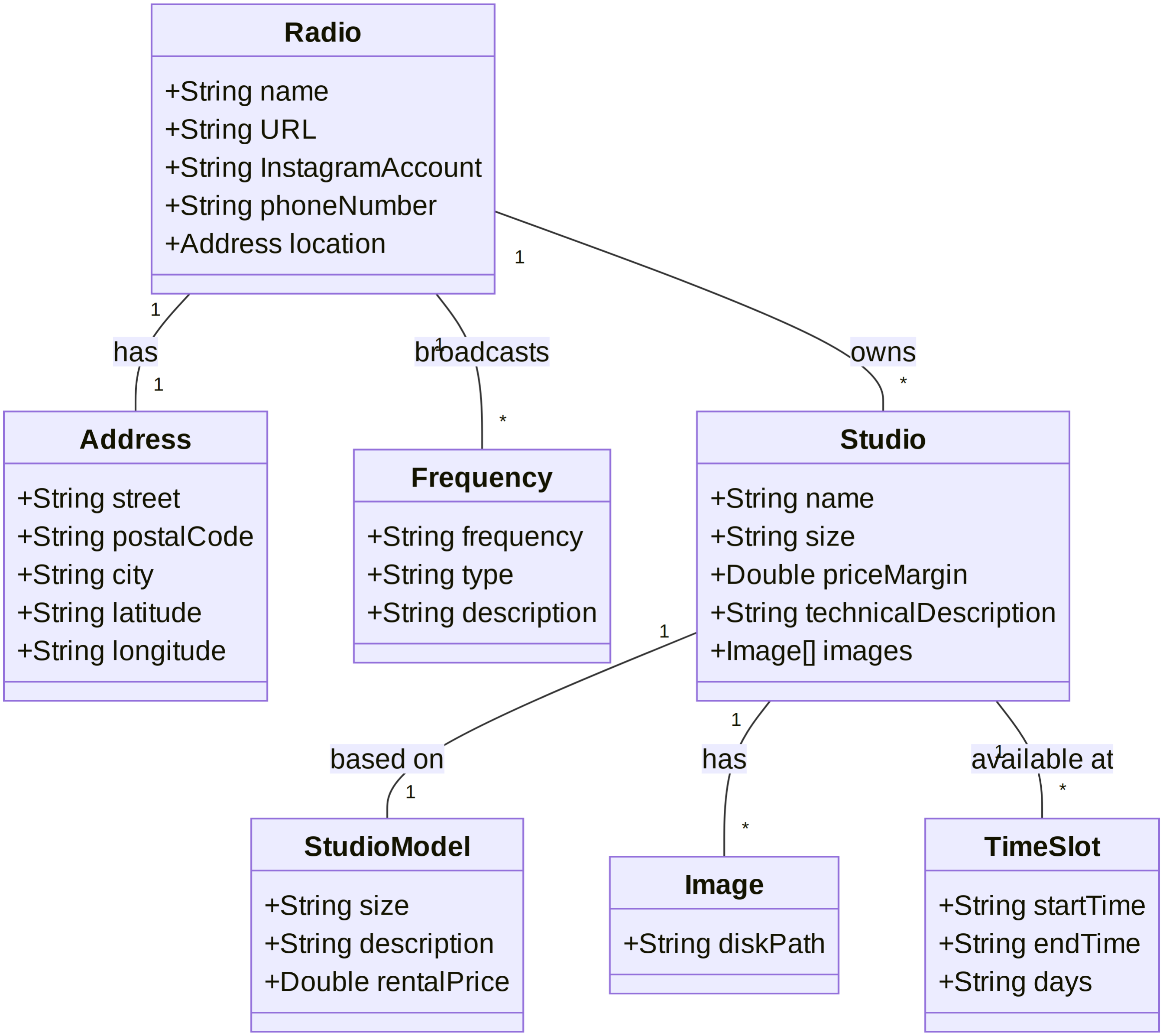

Use Cases
Global Administrator
Define Minimum Rental Price for Studios
Local Administrator
Manage Studio Availability
Technician
Register as an Independent Technician
Anonymous User
Browse Available Studios
Podcaster
Mark a technician as a favorite
Cancel a previously made studio rental
Rent a studio from a local radio station indicating a specific date

Figure 2: Use Case Diagram

Question 3

Class Diagram



Explanation

1. **Keys:**
   - **Radio**: The key for the Radio class is the `name` attribute, which is unique.
   - **Studio**: The key for the Studio class is the `name` attribute, which is unique within the context of a Radio station.

2. **Textual Integrity Constraints:**
   - **Radio**: Each Radio must have at least one associated Frequency, which is identified by its unique combination of frequency value, type (FM or AM), and description.
   - **StudioModel**: Each StudioModel is uniquely identified by its `size`. No two models can refer to the same size.
   - **Frequency**: The primary frequency for each Radio station is mandatory, ensuring that each Radio has at least one Frequency marked as primary.
3. **Derived Information:**
   - **Studio Final Price**: The final price of a Studio is derived from the base price defined in the StudioModel plus an optional price margin specified by the Radio station when defining a Studio. This allows for the calculation of the final price which is stored and used for transactions.

Question 4

Class Diagram

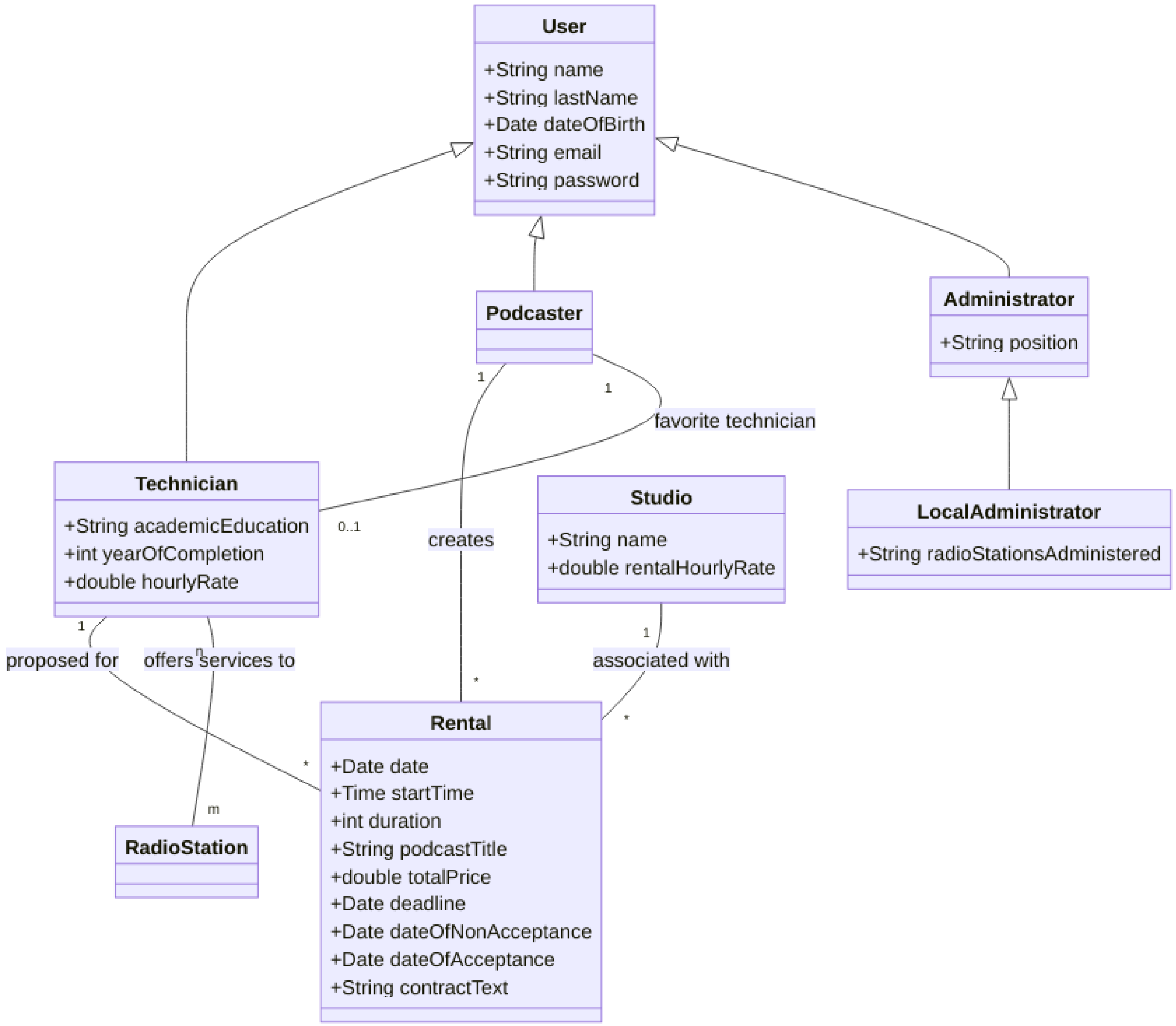


Figure 3: Class Diagram

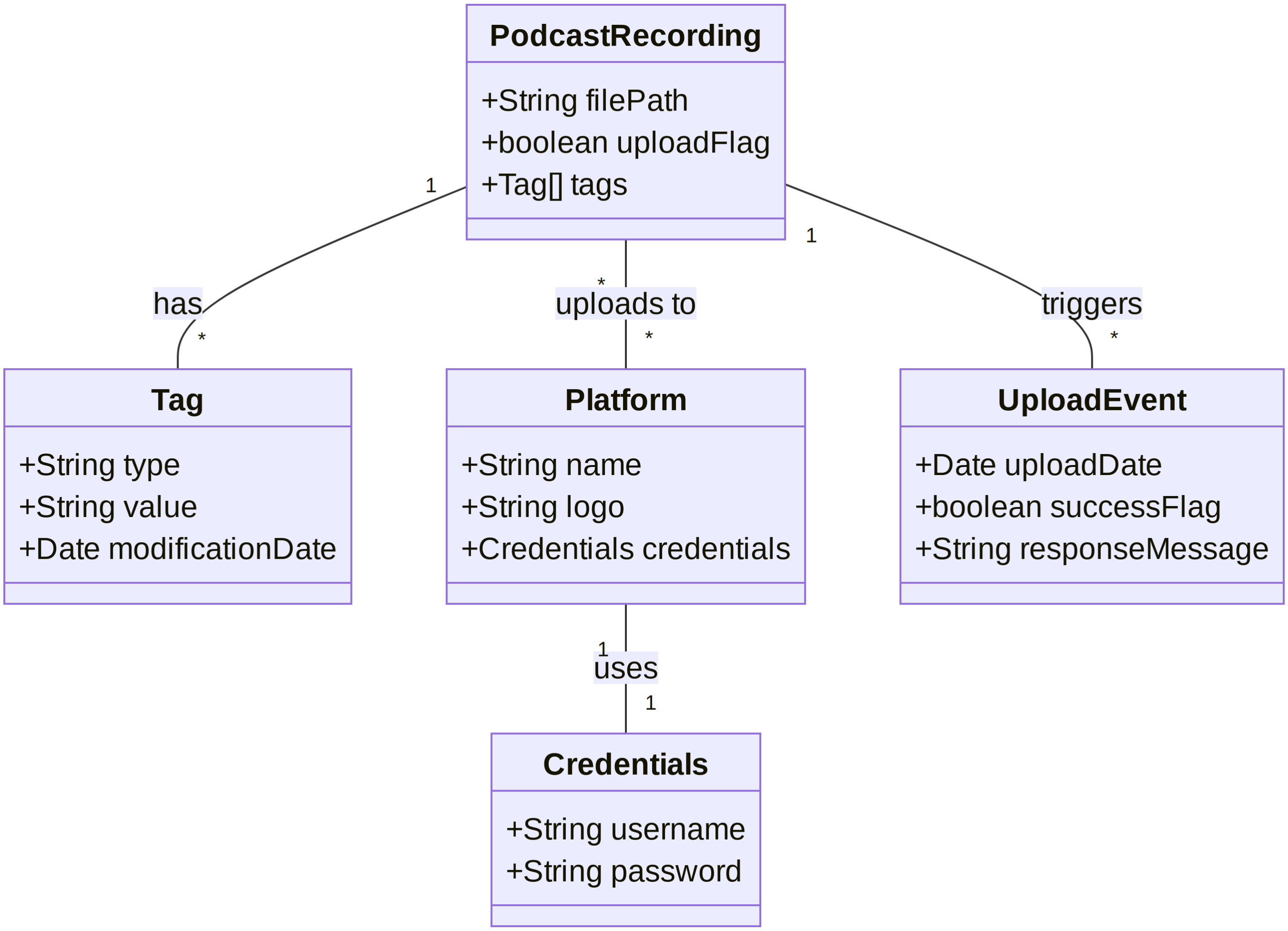
Explanation

- **Keys:**
  - **User**: The `email` attribute serves as the unique identifier.
  - **Studio**: The `name` attribute can be considered unique within the context of a radio station.
  - **Rental**: A composite key could be formed with `date`, `startTime`, and `Studio` as no two rentals can start at the same time in the same studio.

- **Integrity Constraints:**
  - A Technician must be associated with at least one RadioStation.
  - A Rental must have a valid Podcaster, Technician, and Studio associated with it.
  - The `totalPrice` in Rental is derived from `Studio.rentalHourlyRate`, `Technician.hourlyRate`, and `duration`.
- **Derived Information:**
  - **Rental.totalPrice**: Derived from multiplying the sum of `Studio.rentalHourlyRate` and `Technician.hourlyRate` by the `duration` of the rental.

Question 5

Class Diagram



Explanation

- **Keys:**
  - **PodcastRecording**: The `filePath` attribute can serve as a unique identifier.
  - **Platform**: The `name` attribute is unique.
  - **Tag**: A composite key of `type` and `PodcastRecording` could uniquely identify a tag, ensuring that there can only be one tag of each type per recording.
- **Integrity Constraints:**
  - Each podcast recording must have exactly one tag of type “title” and can optionally have one of type “description”.
  - Each platform must have unique access credentials.
- **Derived Information:**
  - **UploadEvent.successFlag**: This flag is derived based on the response from the platform after attempting to upload a podcast recording. If the platform responds positively, the flag is set to true; otherwise, it is set to false.