

# CAT 2

## UML Analysis

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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 CAT2 individually and only with the help that the professors of this subject considered appropriate, according to the FAQs about plagiarism.

## Question 1

### 1) RealEstateProperty

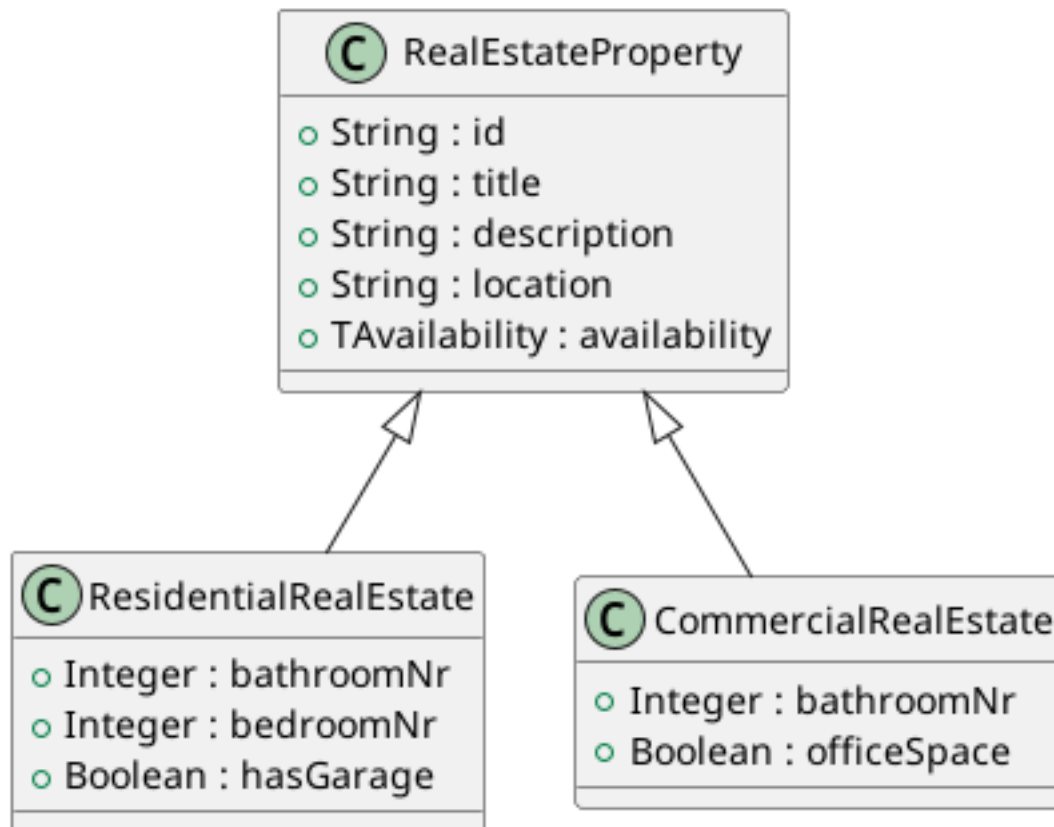


Figure 1: Class Diagram

## 2) FitnessExercise

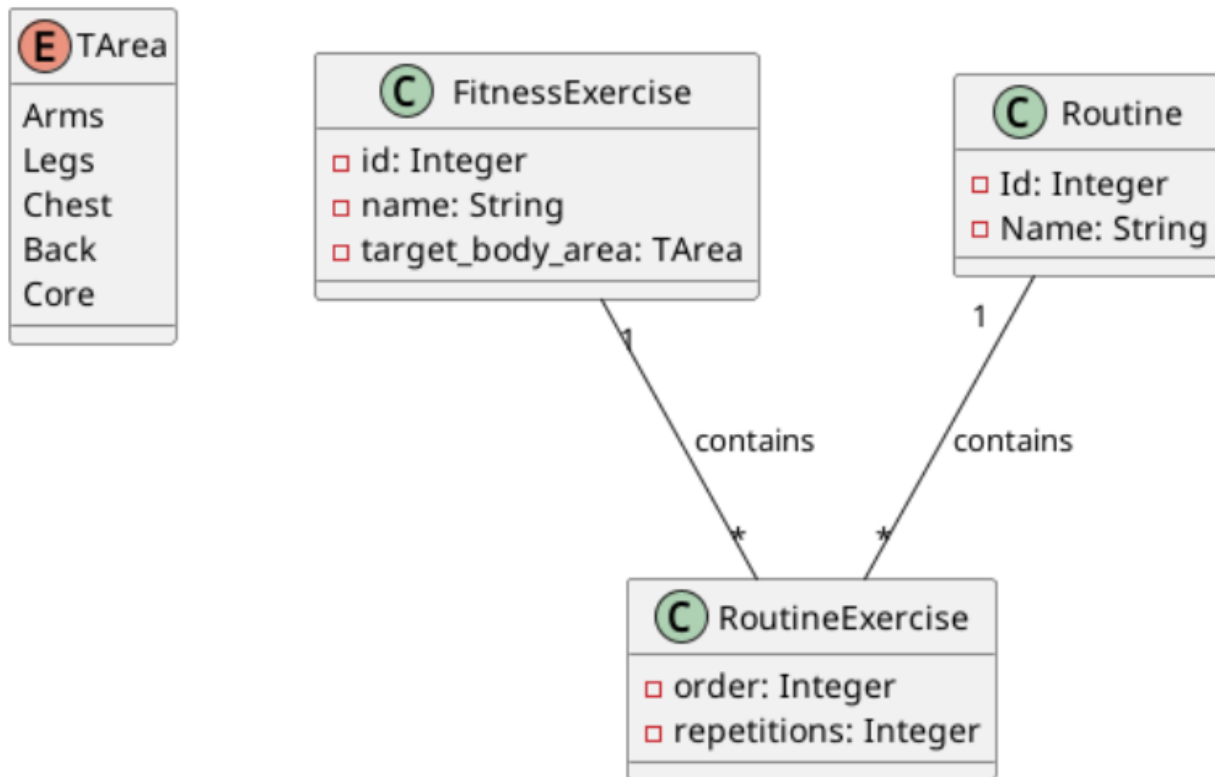


Figure 2: Class Diagram

## 3) Swimlanes diagram

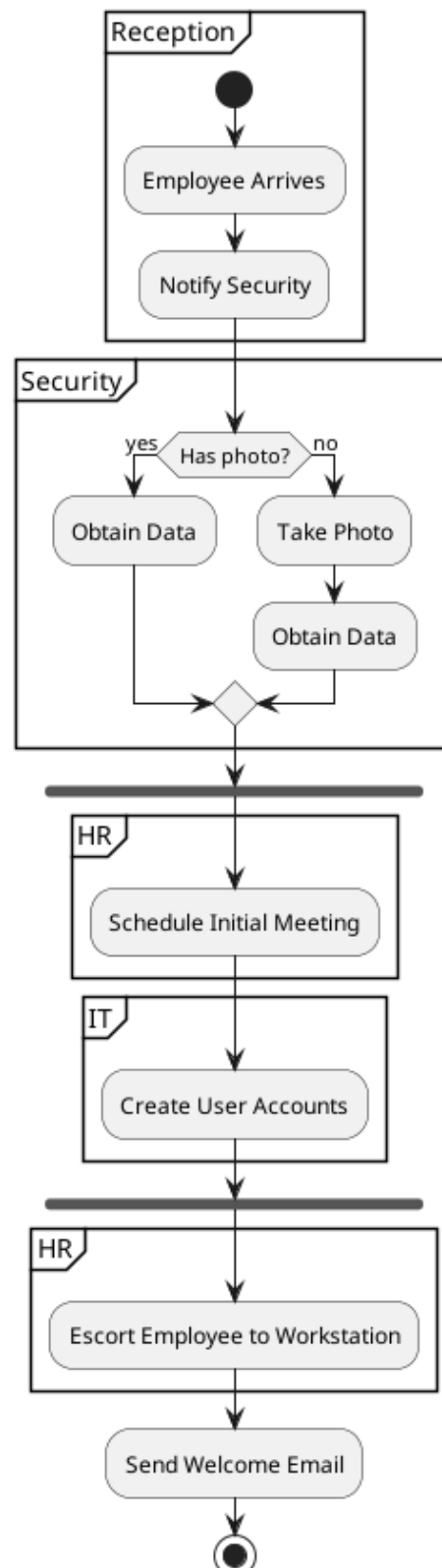


Figure 3: Activity Diagram

## Question 2

### Note

All diagrams have been created with [PlantUML](#), a tool used to generate UML diagrams from plaintext.

For this exercise, here is the code that generates the class diagram:

```
@startuml

abstract class HealthCareWorker {
    + name
    + lastName
    + ID
    + dateOfBirth
    + phoneNumber: List
}

class Doctor extends HealthCareWorker {
    + isResident: Boolean
}

class Nurse extends HealthCareWorker {
    + yearsExperience: Int
}

Nurse "0..1" -- "*" Nurse: Supervises

class Specialty {
    + name
    + onCall: Boolean
}

class HealthCareCenter {
    + name
    + address
    + floor?: String
}

Doctor "SpecialistIn" -- "Specializes In" Specialty
HealthCareWorker "LocatedIn" -- "1" HealthCareCenter
```

@endum1

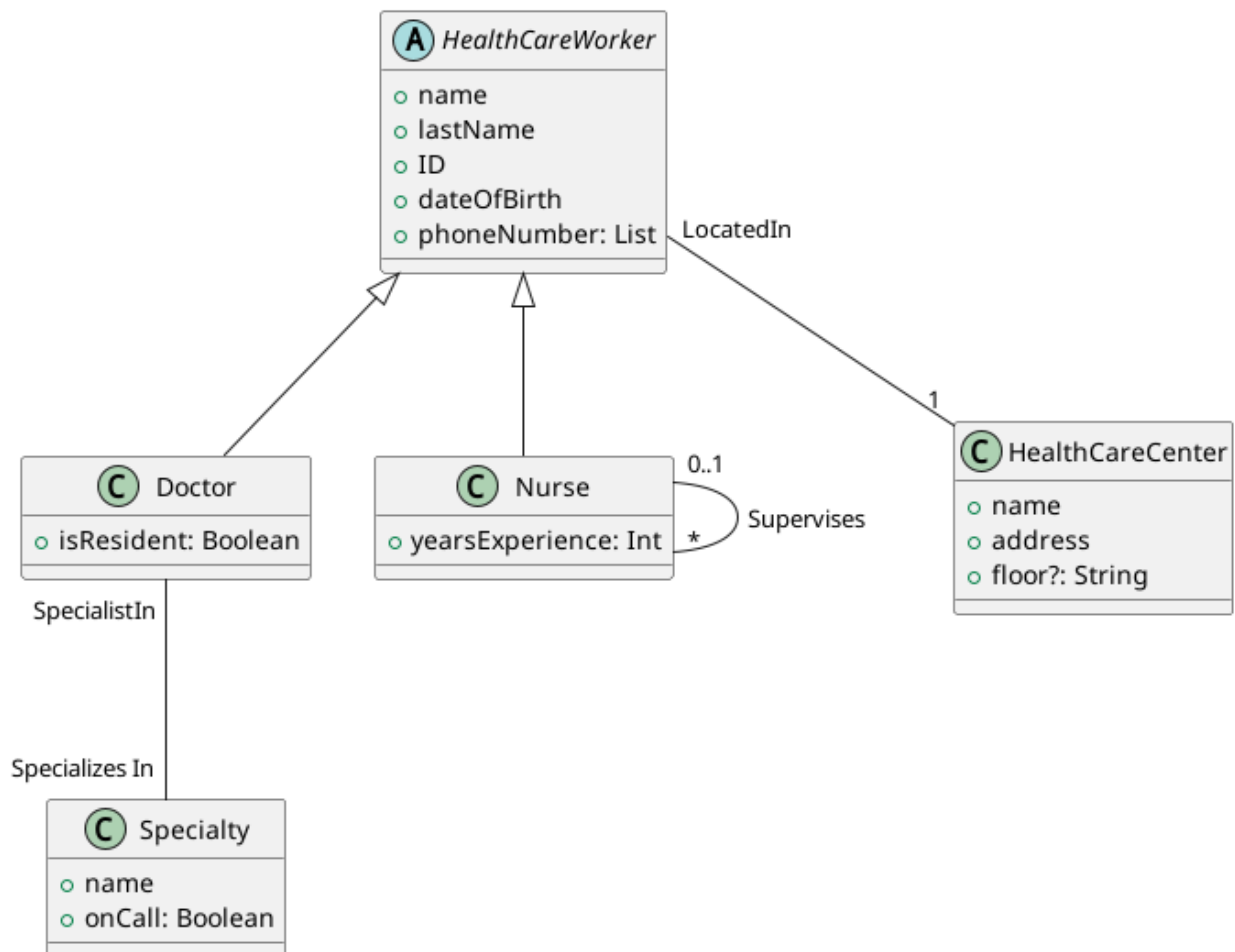
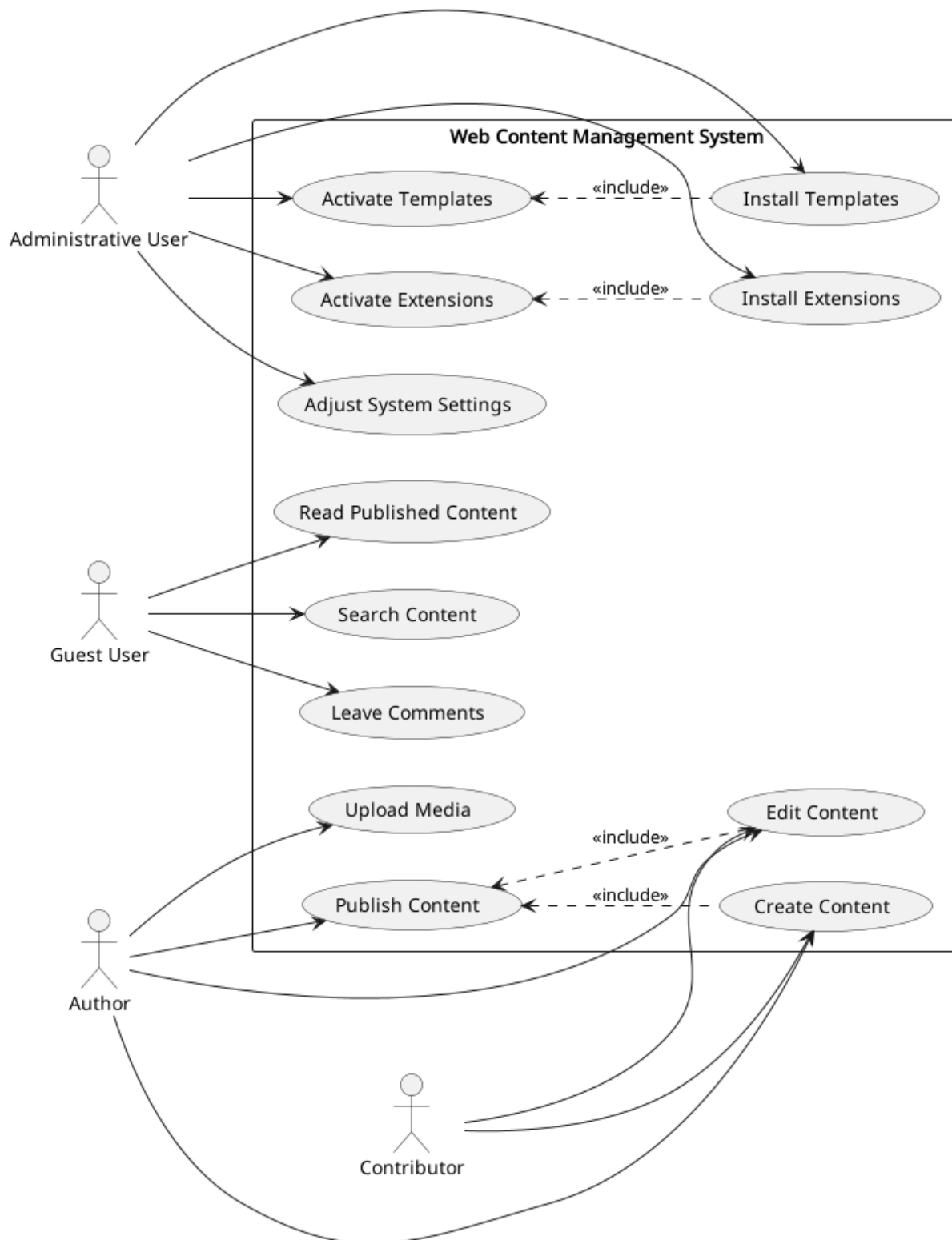


Figure 4: Class Diagram



## Question 3



## Question 4

a)

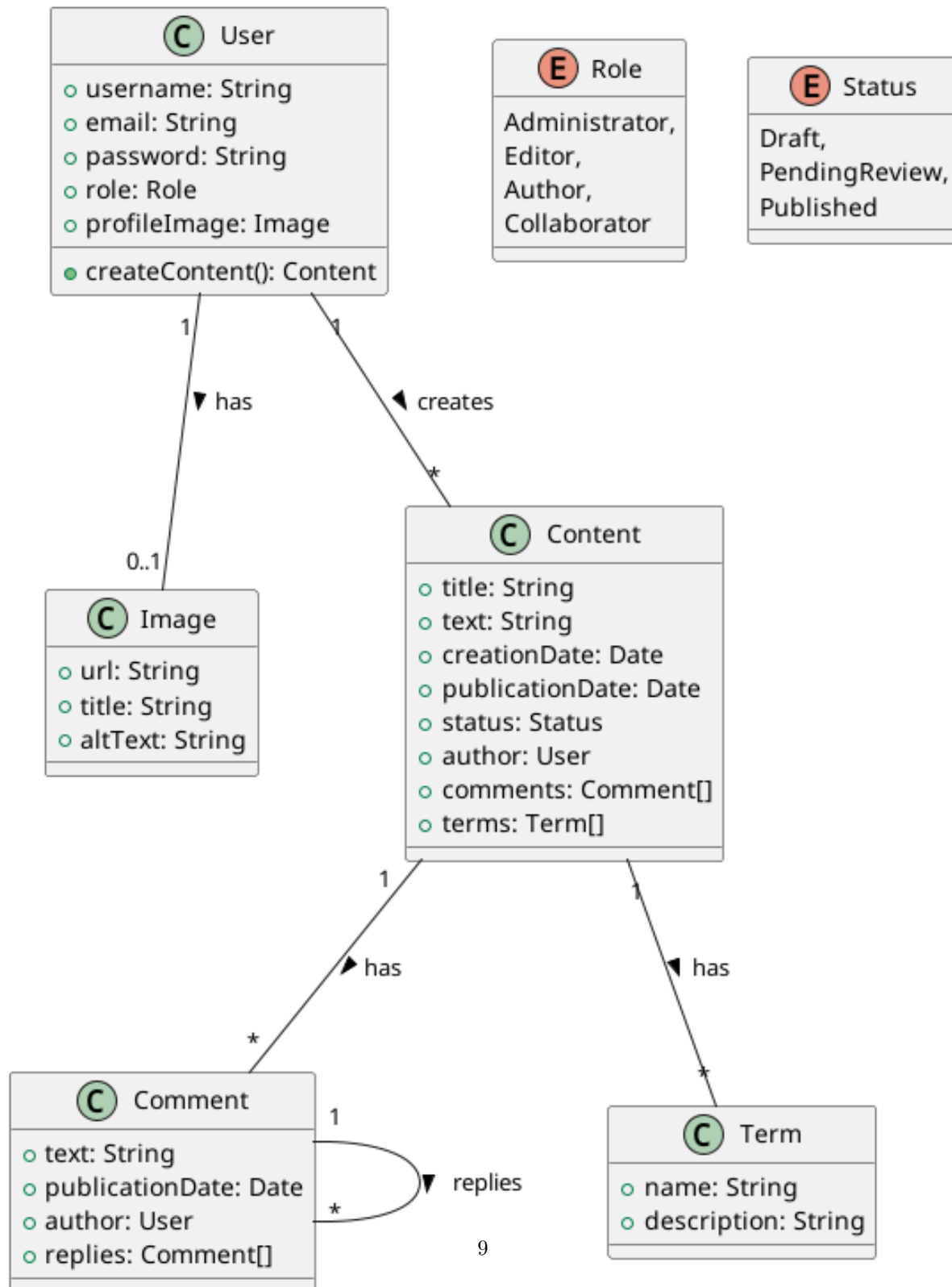


Figure 6: Class Diagram

b)

- Restrictions:
  - Usernames and email addresses are distinct for every user, excluding repetitiveness.
  - Each term retains a unique name, avoiding any duplication.
- Integrity constraints:
  - A profile image, once linked to a user, remains exclusive to that user.
  - Every piece of content has a single author, preventing multiple authorship.
  - Only after a piece of content is created can comments be made, ensuring chronological integrity.
  - Each piece of content is associated with at least one category, and can have many, or no tags, ensuring the flexibility of content association.
- Other considerations:
  - Content status is inferred from the creation and publication dates. If not published, content is either in Draft or PendingReview status. If published, status is Series.
  - Replies to comments are tracked from associated comments with content. Any reply is registered under the original comment.
  - The attached terms with content are derived from terms assigned to the same.

## Question 5

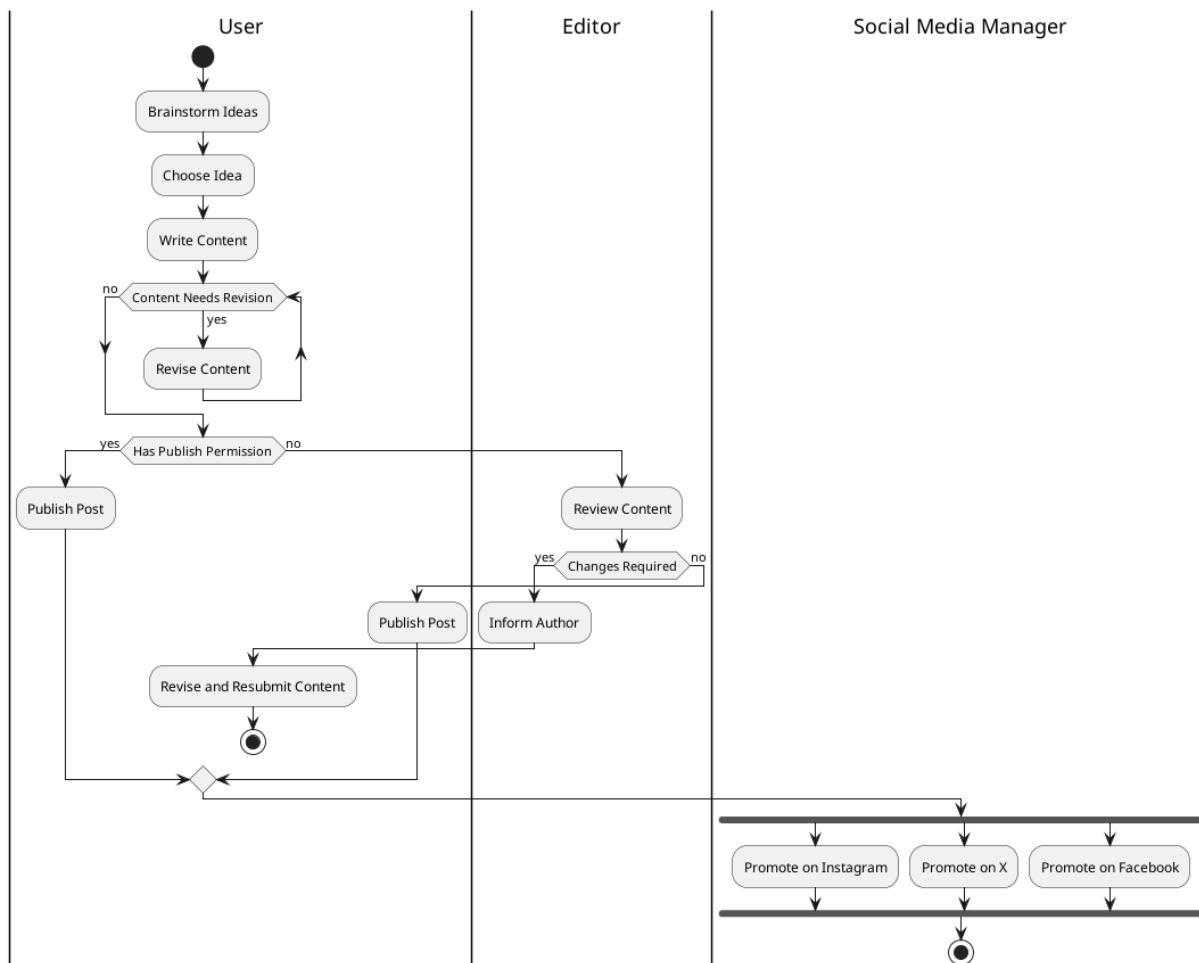


Figure 7: Activity Diagram

## Question 6

a)

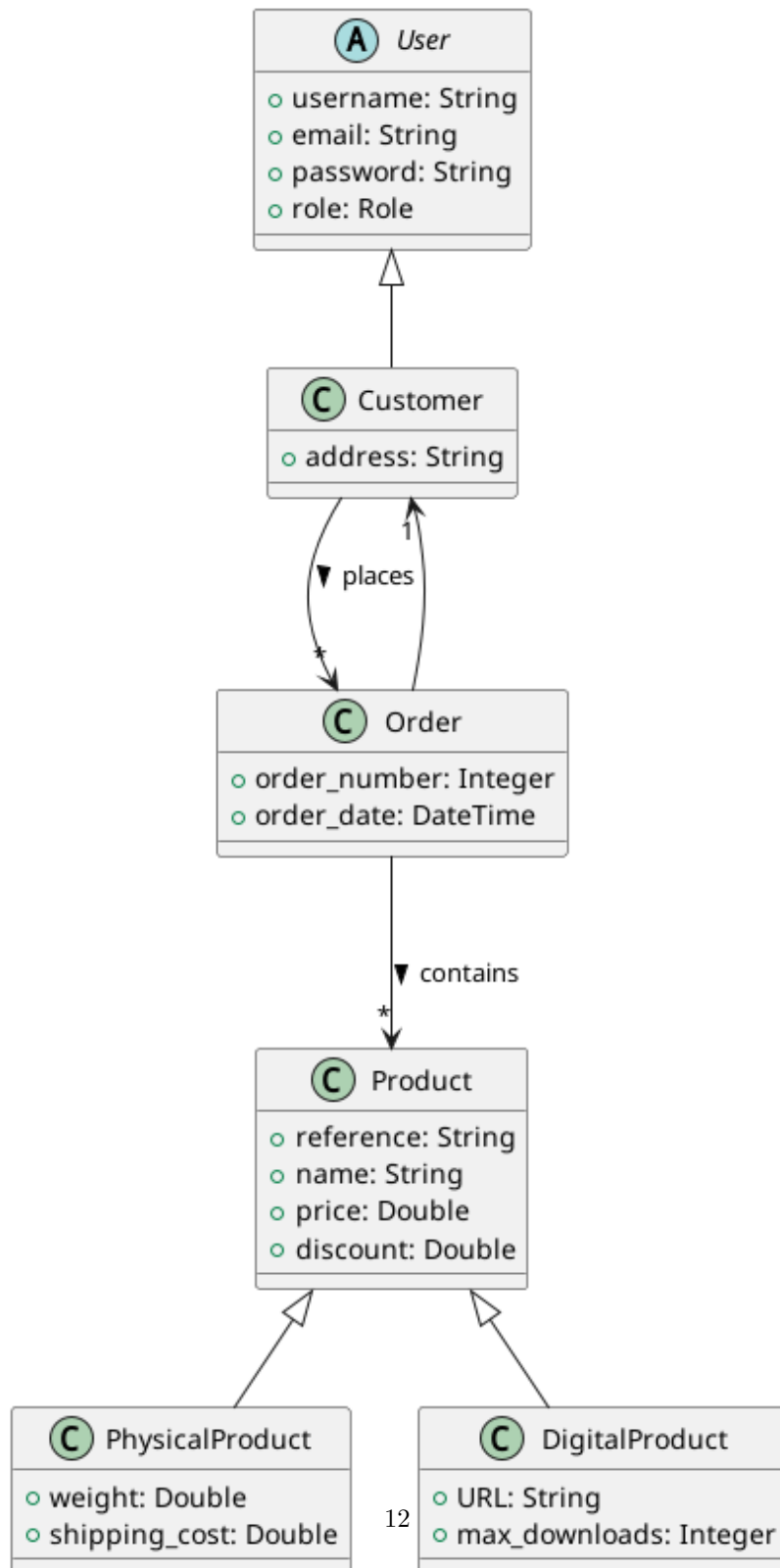


Figure 8: Class Diagram

b)

- Restrictions:
  - Each product has a unique reference number.
  - The price of a product should be non-negative. If it's zero, meaning the product is free, it cannot have a discount.
- Integrity Constraints:
  - Each order is placed by a single customer and can contain one or more products. An order can't exist without a customer.
  - A user can be a customer, meaning a user can place orders.
  - Data about each product's type - physical or digital - is maintained. Weight and shipping cost are associated with physical products while a URL and max downloads are tracked for digital products.
- Other considerations:
  - The total amount of each order, in terms of cost, is derived by the aggregation of subtotals of individual products in the order, the result of multiplying the number of units by the price of the product.
  - The available inventory can be indirectly tracked by assaying the count of each product reference in all orders.