Assignment 1

Sample solution is posted in UM Learn. If you believe there has been an error in the grading of your assignment after reviewing the solution, please submit an appeal to the Assignment 1 Grade Appeal folder in UM Learn (under Assessments then Assignments).

Class scores distribution Show

My score
87.5% (14/16)

Honesty

0 / 0

When submitting this assignment, I confirm that I have have met all of the Expectations for Individual Work in Computer Science and followed the academic integrity policies of this course and the University. I have not collaborated inappropriately in my work, and I have not used material from any sources except those that were explicitly permitted.

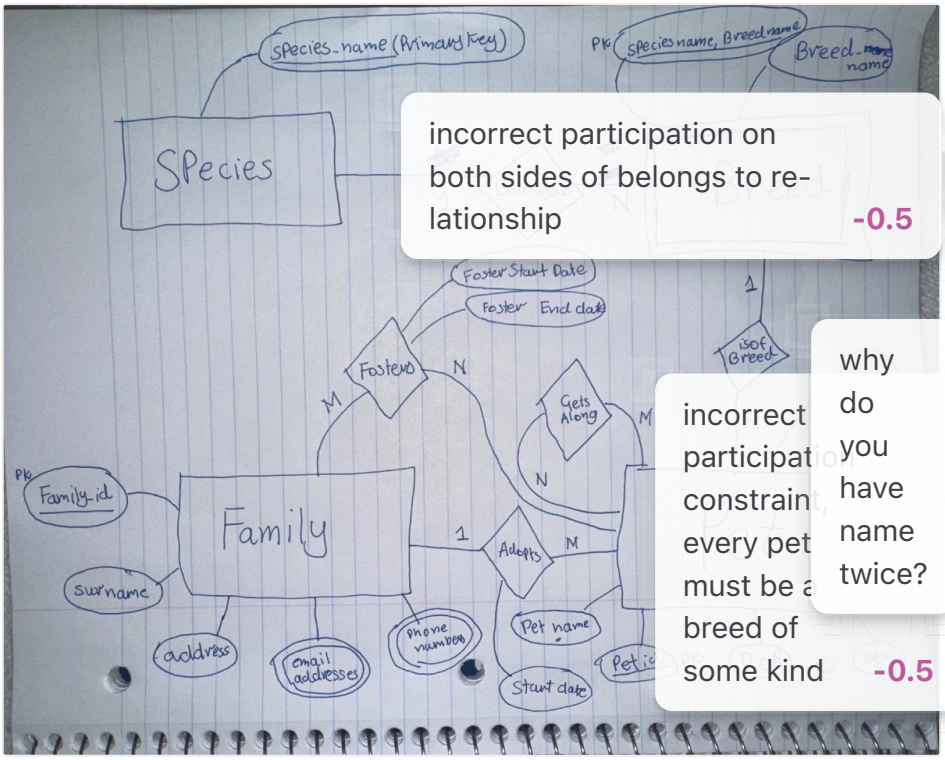
Enter your name below.

Ali Nawaz

Q1

7 / 8

Submit your answer for Part 1 here. Assignment instructions are posted in UM Learn.



Assumptions :

.Breed is modelled as a weak entity because BreedName is only unique within a Species.
Pets are uniquely identified by PetID; names may not be unique.
The GetsAlongWith relationship is symmetric; if Pet A gets along with Pet B, then Pet B gets along with Pet A.
Families can adopt and foster pets; there is no exclusive constraint unless specified.
Once a Pet is adopted, it cannot be fostered or adopted again by another family.
Email addresses and phone numbers are treated as multi-valued attributes.

Relationships:

1 . **BelongsTo** - Identifying Relationship between **Breed** and **Species:**
Cardinality: One-to-Many from **Species** to **Breed** (each species can have many breeds, but each breed must belong to only one Species)
Participation: Breed : Total Participation(each breed must belong to a species), Species: Partial Participation (a species might not have any breeds)
Possible Primary Key: N/A - since an identifying relationship, Breed's Primary key already includes the Species-Name

2. **isOfBreed -** Relationship between Pet and Breed
Cardinality: Many to 1, from pet to breed (Because multiple pets can be of the same breed, but each pet belongs to one breed)
Participation: Pet: Total Participation(each pet must have a breed),
Breed: Partial Participation(a breed might not have any pets currently)
Possible Primary Key: PetID in **Pet**

3. **GetsAlong** - Recursive Relationship on pet
Cardinality: Many to Many ()
Participation: Partial participation on both sides(pets may, or may not get along with other pets)
Possible Primary Key: Combination of **PetID1** and **PetID2**

4. **Fostering -** Relationship between Pet and Family
Cardinality: Many to Many (Because pets can be fostered by multiple families, and a family is able to foster multiple pets)
Participation: Partial Participation on both sides, as not all pets are fostered and not all families foster pets.
Attributes : FosterStartDate, FosterEndDate
Primary Key: Combination of **PetID**, **FamilyID**, **FosterStartDate**, (when tracking multiple foster periods)

5. **Adoption** - Relationship between Pet and Family
Cardinality: Many to One, Because a pet can not be adopted by more than one family, but a family can adopt more than one pet.

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Participation: Partial Participation on both sides because there is no compulsion for every pet to be adopted and every family to adopt a pet.
Possible Primary Key: PetID (since each pet is adopted only once)
Attributes: AdoptionStartDate

Entities:

Species:
Attributes : SpeciesName (Primary Key)
Breed (weak entity):
Attributes : Breed_name
Primary Key : Combination of **SpeciesName** and **BreedName**
Pet:
Attributes : PetID (Primary Key), D.O.B, Sex, Favourite_toy, Name,
Family:
Attributes: FamilyId (Primary Key), Surname, Address, E-mail Addresses, Phone Numbers

Q2

7 / 8

Submit your answer for Part 2 here. Assignment instructions are posted in UM Learn.

Assumptions :

Authors: Only authors who have written books sold by the bookstore are inclu

Warranties: Warranties are only associated with computers.

Sections: Each section is uniquely identified by sectionID without needing to combine with term or courseNumber.

Terms: Stored as an attribute in Section rather than a separate entity.

Relationships :

Product Specialisations:
Cardinality : One to One
Participation : Total Participation for the Product, Partial participation for subclass.

Book Specialisations:
Cardinality: One to One from Book to Textbook
Participation : Partial participation for Book, Total Participation for Textbook

WrittenBy(Between Book and Author):
Cardinality: Many to Many
Participation: Total Participation for both book and Author
Primary Key : (BookID,AuthorId)

HasWarranty(Between Computer and Warranty):
Cardinality: One to One
Participation: Partial Participation for computer(Since not all computers have Warranties), and Total participation for Warranty(since each warranty is associated with a computer)
PrimaryKey: WarrantyID

Requires(Between Textbook and Course):
Attributes : (isRequired — boolean variable)
Cardinality : Many to Many
Participation: Course have partial Participation since some courses may not require any textbooks. Textbooks have full participation(since any textbook must be associated with a course)

HasSection (Between Course and Sections):
Cardinality : One to Many Cardinality : A course can have multiple sections, but each section is for one course

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Partial Participation for courses, since a course many not have any sections if they are not offered in the term, and full participation for sections, since every section must belong to a course.

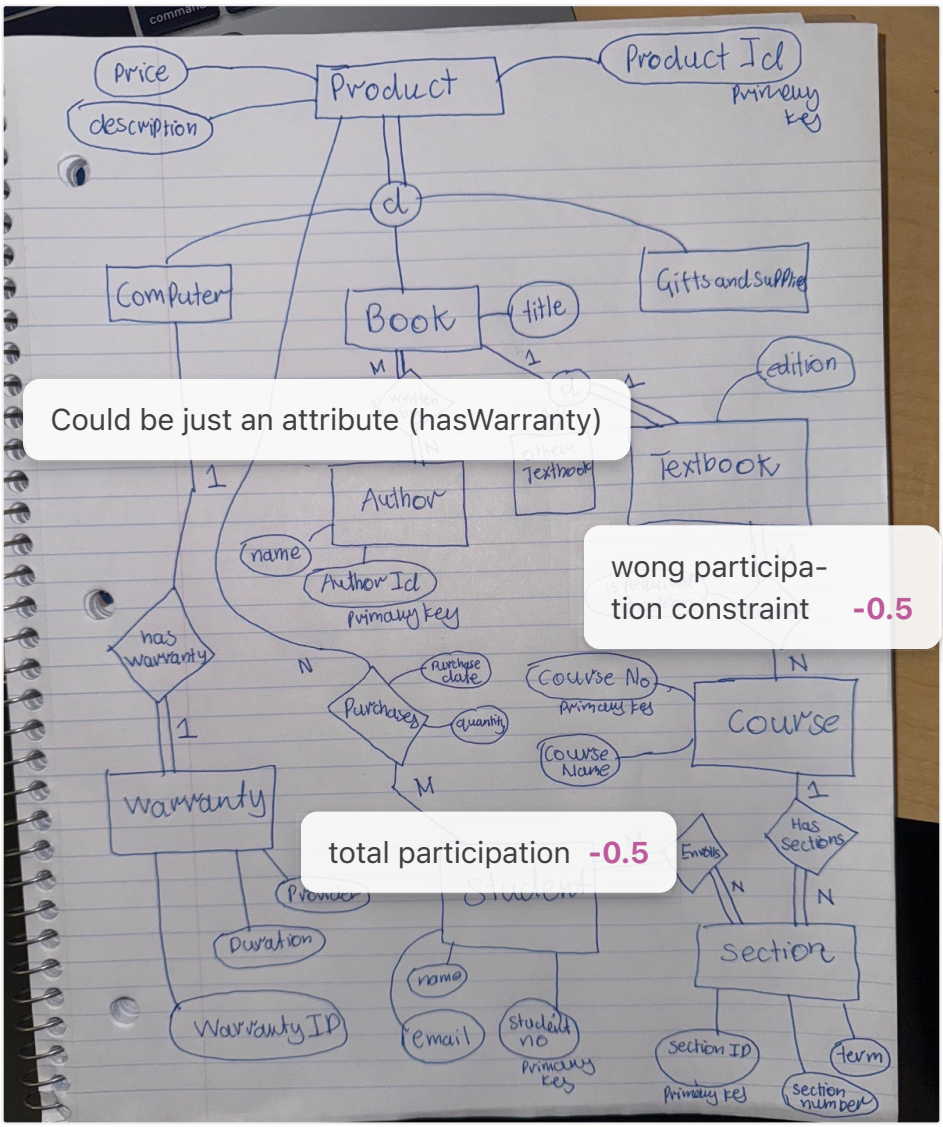
Enrols (Between Student and Section):
Many to Many Cardinality: Students can enrol in multiple sections and a section can also have multiple students.
Full participation: A student must be enrolled in any section to be considered a valid student, and a section must have students enrolled for it to be considered a section.

Purchases(Between Students and Products)
Cardinality: Many to Many : Students can purchase multiple products, and a product can be purchased by multiple students.
Partial participation for both Student and Product, since a student may have made no purchases, and a product may have made no sales.

Primary Keys for the relationships

Written_By: Combination of bookID and authorID.
Requires: Combination of textbookID and courseNumber.
Enrols: Combination of studentNumber and sectionID.
Purchase: Combination of studentNumber, productID, and purchaseDate.
Has_Warranty: Not applicable as it's a one-to-one relationship; the warrantyID can serve as a foreign key referencing computerID.

2



wong participation constraint -0.5

total participation -0.5