Database Introduction

Take Home Exam

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Question 1

Q.1.1 Application software is a program that is designed to complete a specific task says quickbase(n.d.). An example being a system that manages users that have insurances by giving users information on their accounts.

Q.1.2 End users are a type of user that can only view data that they have permission too, they interact with the data mainly whereas the administrator can create and manage any of the items claims PowerDMS(2019).

Q.1.3 **Data Integrity**: By applying some data integrity rules the Database Management System will reduce data redundancy and increase data consistency Study.com(2021).

Multi user Access Control: The Database Management Systems uses advanced algorithms to make sure that multiple users have access to the database simultaneously Study.com(2021).

Question 2

Q.2.1

- One owner can own one or more pets and a pet can only be owned by one owner.
- Each species can have one or more different types of breeds but each breed can only belong to one species.
- One entry can take part in one competition; each competition can have multiple entries.
- A pet can have one entry. A pet can have multiple entries.

Q.2.2.1 One-to-one relationship, one employee can manage 1 or 0 branches.

Q.2.2.2 One-to-Many relationship, one or more space shuttles can transport one or more astronaut.

Q.2.2.3 One-to-Many, each person can have one or more qualifications.

Question 3

Q.3.1 ClassID

Q.3.2 This is a ternary relationship because we have 3 entities having a relationship with 1 entity.

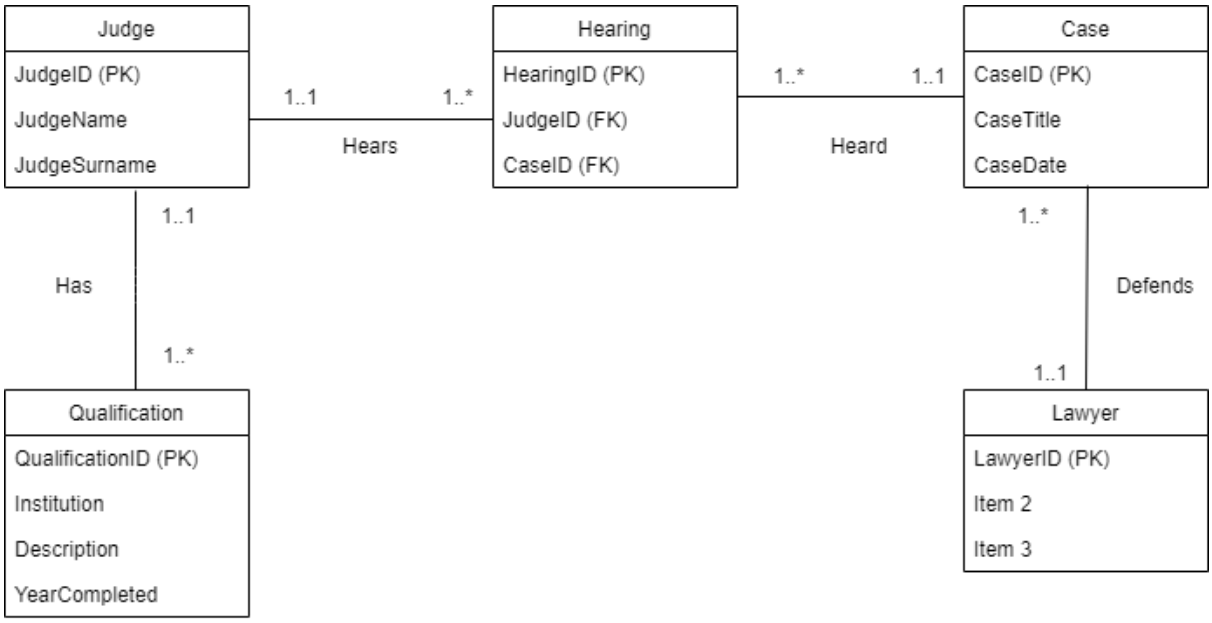
Q.3.3.1 No, because in the surname column there are 2 people with the same surname and a primary must be unique.

Q.3.3.2 Yes, the secondary key will assist us in identifying a record. The secondary does not have to be unique like the primary key.

Question 4

Q.4.1 A binary relationship is when two different entities have a common relationship and a unary relationship is when an entity has a relationship with the same entity. An example of a unary is a Judge may be prerequisites to other Judges claims Hoffle (2021).

Q.4.2



Question 5

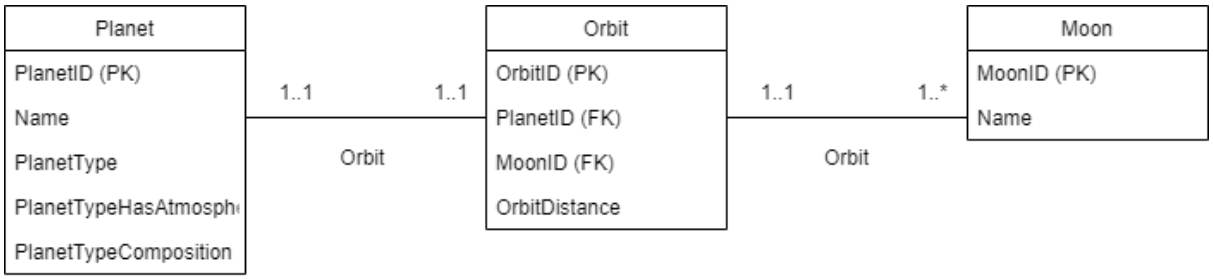
Q.5.1 The 2NF is in the 1NF and has no partial dependencies. The 3NF is in the 2NF and has no transitive dependencies.

Q.5.2.1 Second Normal Form, the information is in the 1NF and has no partial dependencies.

Q.5.2.2 First Normal Form, the table shows all the primary keys and the partial dependencies.

Q.5.2.3 unnormalized, because the table did not highlight any of primary keys and the partial and transitive dependencies. There are also multiple sub records in the same group.

Q.5.3



- A new entity has been introduced.
- The new entity has its own primary key and the primary keys of Planet and moon are now the foreign keys or the orbit entity.

Q.5.4

Second Normal Form

Player Name	Player Date Joined

Character Name	Character Level	Character Max Health

Player Name	Character Name	Character Level

Each of the partial dependencies is grouped together and tables are created separately. A table with the primary keys and the character level is created separately.

Third Normal Form

Player Name	Player Date Joined

Character Name	Character Level	Character Max Health

Player Name	Character Name	Character Level

Character Level	Character Max Health

A new table is created having the Character level as the primary key and the Character Max Health as a attribute.

Question 6

Q.6.1.1
```
create table Lawyer(
    LawyerID int not null auto_increment,
    LawFirmID int not null ,
    Surname varchar(50) not null,
    Name varchar(50) not null,
    Age int not null,
    primary key(LawyerID),
    foreign key(LawFirmID) references LawFirm(LawFirmID)
);
```

Q.6.1.2
```
select AVG(Age)
from Lawyer
where Age > 40;
```

Q.6.1.3
```
insert into LawFirm(LawFirmID, Name, YearIncorporated)
values (4, 'Wicked and Righteous', 2020);
```

Q.6.1.4
```
select * from LawFirm
order by Name ASC;
```

Q.6.1.5
```
select * from LawFirm
        where name like = '%z%';
```

Q.6.1.6
```
select Lawyer.Name, Lawyer.Surname, LawFirm.Name
from Lawyer, Lawfirm
where Lawyer.LawFirmID = LawFirm.LawFirmID;
```

Q.6.2 The where clause can't be used with aggregate functions whereas the having clause can.

Q.6.3 To find a record

Q.6.4.1 We will get an error because the surname is not specified and all attributes are not null.

Q.6.4.2 We will see the team names of the teams the have 2 drivers in their team.

Q.6.4.3 The table Racing Team will be deleted

References

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