1.8.2 Relational database modeling updated new

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1.8.2
Relational

Computer Science Assignment
Topical Past Papers

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1.8.2 Relational Database Modelling

May/June 2003

10. A sports club runs a number of sports teams.

Each team is made up of a number of members of the club and each member may play for more than one team. Each team has a number of coaches, but the coach's job is so time consuming that each coach can only coach one team.

Represent the above information on an entity relation (ER) diagram, in 3rd normal form, stating the primary key for each entity. [13]

Oct/NOV 2003

11. A garden design company keeps records of its customers. Each customer has had a design produced for them which will be one of a library of design types stored by the company.

Each design type uses plants. Each customer is sent an account based on the number of plants in the design.

(a) Draw an E-R (entity-relationship) diagram in third normal form, based on this information. [10]

(b) Each delivery of plants to the garden design company is identified by a batch number.

Explain how customers who received eucalyptus trees from batch 12 can be contacted. [4]

May/June 2004

1. (a) In relation to databases, describe what is meant by each of the following terms.

(i) Primary key. [1]

(ii) Secondary key. [1]

(iii) Foreign key. [1]

Oct/NOV 2004

2. A landscape garden company services a number of gardens. Each GARDEN is owned by an OWNER. Each owner may have more than one garden. Each garden has a number of PLANTS in it and each plant may be in a number of gardens.

Draw an entity relationship (E-R) diagram to represent this data model in third normal form and label the relationships. [10]

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Oct/NOV 2006

2. (a) State what is meant by the terms:

(i) primary key,

(ii) secondary key,

(iii) foreign key

in the context of a table in a relational database. **[3]**

Oct/NOV 2007

2. There are a number of TEAMs which represent a school.

Each team has a TEACHER who runs it and a teacher may run more than one team.

Each team has a number of PLAYERs and each one may play for more than one team.

Draw an entity relationship (E-R) diagram to represent this data model in third normal form and label the relationships. **[6]**

Oct/NOV 2008

3. Part of a school database consists of a table of student details and a table of teacher details.

A teacher teaches many students.

A student is taught by many teachers.

(a) (i) State the type of relationship between the two tables. **[1]**

(ii) Explain how the relationship between the student and teacher tables can be normalised. **[2]**

(iii) Draw the normalised relationship between the tables in the form of an entity-relationship (E-R) diagram. **[3]**

(b) Explain what is meant by each of the following terms and give an example of each from the tables in part (a).

(i) Primary key

(ii) Foreign key **[4]**

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May/June 2009

4. A furniture shop sells a large number of different items whose details are stored in the STOCK table.

The shop has a large number of customers whose details are stored in the CUSTOMER table.

Some customers have an account. Each customer can only use one account. Some accounts can be used by more than one customer (for example all the members of one family may use the same account). Details of accounts are stored in the ACCOUNT table.

(a) Draw the relationship between the CUSTOMER and ACCOUNT tables in the form of an entity-relationship (E-R) diagram. **[1]**

A number of stock items will be stored on each account. Each type of stock item will be stored on many accounts.

(b) (i) State the type of relationship between the ACCOUNT and STOCK tables. **[1]**

(ii) Draw the normalized relationship between the ACCOUNT and STOCK tables in the form of an E-R diagram. **[2]**

(c) By using examples from the CUSTOMER table, explain what is meant by:

(i) primary key, **[2]**

(ii) secondary key, **[2]**

(iii) foreign key. **[2]**

Oct/NOV 2009. P32

7. A library uses a computer system to store data in a database.

There are a large number of members of the library whose details are stored in the MEMBER table.

There are a large number of books, details of which are stored in the BOOK table.

Members can borrow books. Each member can borrow more than one book and each book can be borrowed by many members.

(a) (i) State the type of relationship between the MEMBER and BOOK tables. **[1]**

(ii) Draw the relationship between the MEMBER and BOOK tables in third normal form as an E-R diagram. **[2]**

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(b) Use examples of attributes in the MEMBER table to explain what is meant by:

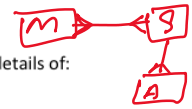
(i) primary key, **[2]**

(ii) foreign key, **[2]**

(iii) secondary key. **[2]**

Oct/NOV 2010. P31

2. The leaders of a youth club want to create a database to store details of:



MEMBERs; SESSIONs and ACTIVITYs.

The sessions are each evening from Monday to Friday. Each member can sign up for one or more of the five sessions.

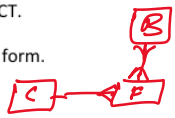
Each session offers a number of activities but each activity is only offered in one of the sessions.

Draw an entity-relationship (E-R) diagram to represent this model in third normal form. **[5]**

Oct/NOV 2010. P33

2. A buildings maintenance company looks after a number of BUILDINGs in a city. Each BUILDING is occupied by one or more FIRMs. Each FIRM may have premises in more than one BUILDING. Each of the FIRMs has a CONTRACT with the company for their part of the BUILDINGs. Some of the FIRMs may share a CONTRACT.

Draw an entity-relationship (E-R) diagram to represent this data model in third normal form. **[5]**



May/June 2011. P31

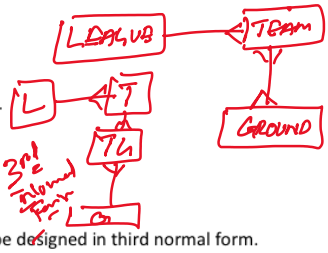
10. A country has a national football competition based on leagues.

Each LEAGUE has a number of TEAMs but each TEAM is only in one LEAGUE.

Each TEAM plays at a number of GROUNDs during the season and each GROUND will host a number of TEAMs during the season.

(i) State the relationship between LEAGUE and TEAM.

Draw the entity-relationship (E-R) diagram to show this relationship. **[2]**



(ii) State the relationship between TEAM and GROUND.

Draw the E-R diagram to show this relationship. **[2]**

(iii) Explain how the relationship between TEAM and GROUND can be designed in third normal form. **[4]**

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