

7BUIS030W REVISION -2

Solutions

Question 1

A firm appoints an agency to vet a potential candidate for a job. The firm gives the employment history and other details to the agency and based on that the agency conduct a background verification of 2 people. Based on the data protection act , describe who are the data actors in this scenario [6 Marks]

In the example following are the data actors:

The job applicants are the data subjects as it is their personal data being used. –

The firm is the data controller as it determines the purpose for which the data is being processed .

The agency is the data processor which process the personal data as per the firm's instructions

Question 2

A training centre provides the members of staff of a large organisation with training courses in a wide range of subjects and at different levels (e.g. beginner, intermediate, proficient, advanced). The training courses are organised over a number of full days(e.g. 2 days, 3 days, 5 days, etc.) The centre is seeking to design and develop a database-driven management system to be used internally to help organise the scheduling of the training courses. The Conceptual Entity-Relationship Diagram (ERD) for part of the training centre's management system is shown below (figure 1). Carefully consider this conceptual ERD.

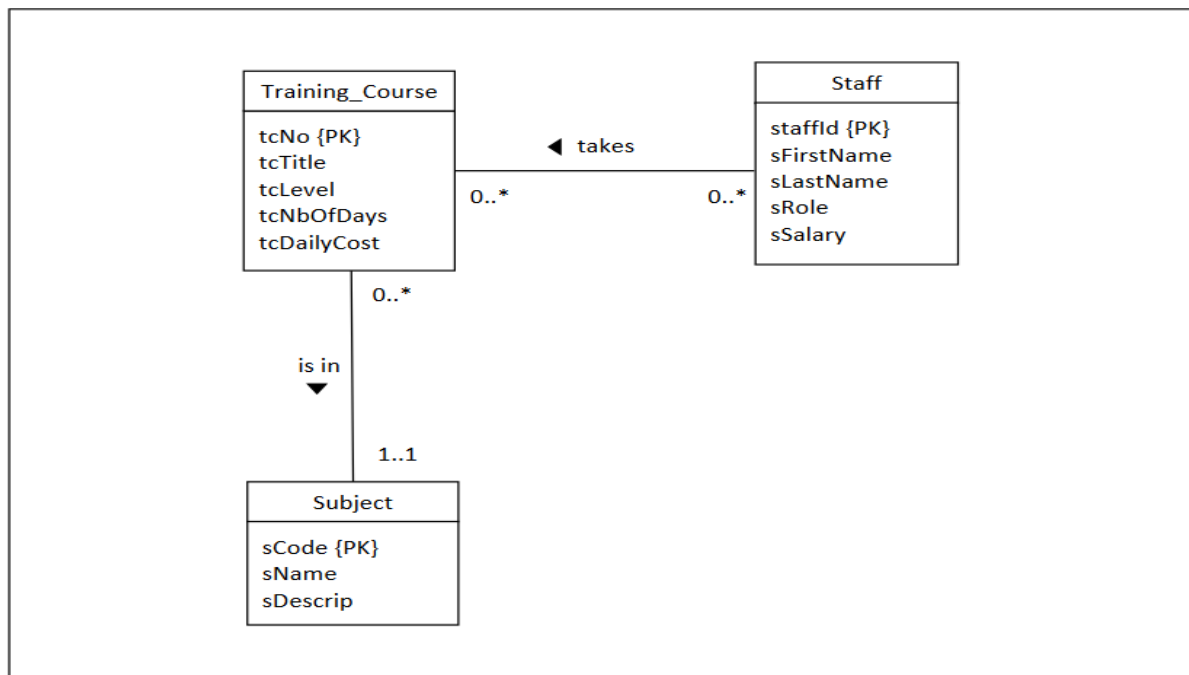


Figure 1: Conceptual ERD for part of the management system

(a) Discuss in detail the multiplicity of the relationship 'is in' (between the entities Training_Course and Subject). Provide adequate justifications to support your answers. [4 Marks]

One training course is designed for a minimum of one subject and a maximum of one subject.

One subject may be taught in no training courses

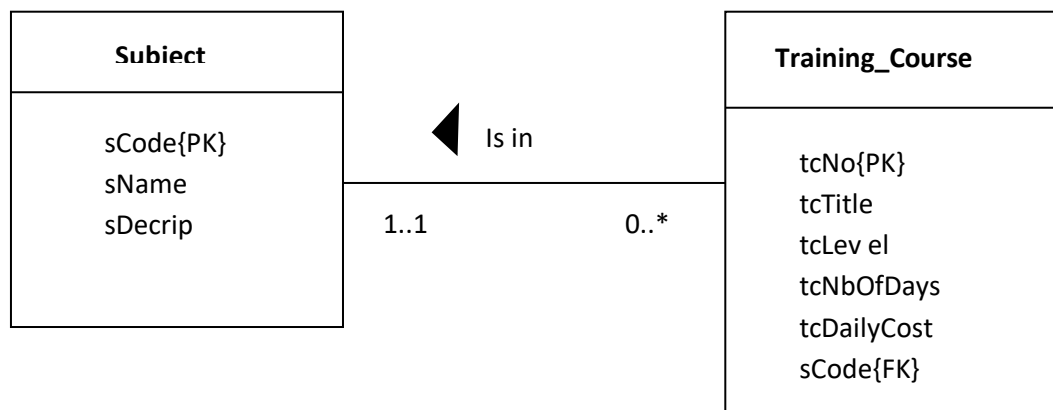
One subject can be taught in many training courses

(b) Briefly explain how you would map the relationship 'is in' (between the entities Training_Course and Subject) to a logical ERD. Provide a diagram to support your answer. Make sure you include all the correct attributes and keys. [6 Marks]

This is a one to many relationship.

In order to map the conceptual model to logical ERD 2 tables to be created.

In this case subject is the parent and Training_Course is the child.



(c) Discuss in detail the multiplicity of the relationship 'takes' (between the entities Staff and Training_Course). Provide adequate justifications to support your answers. [4 Marks]

One staff may take no training course (because he/she is a new staff)

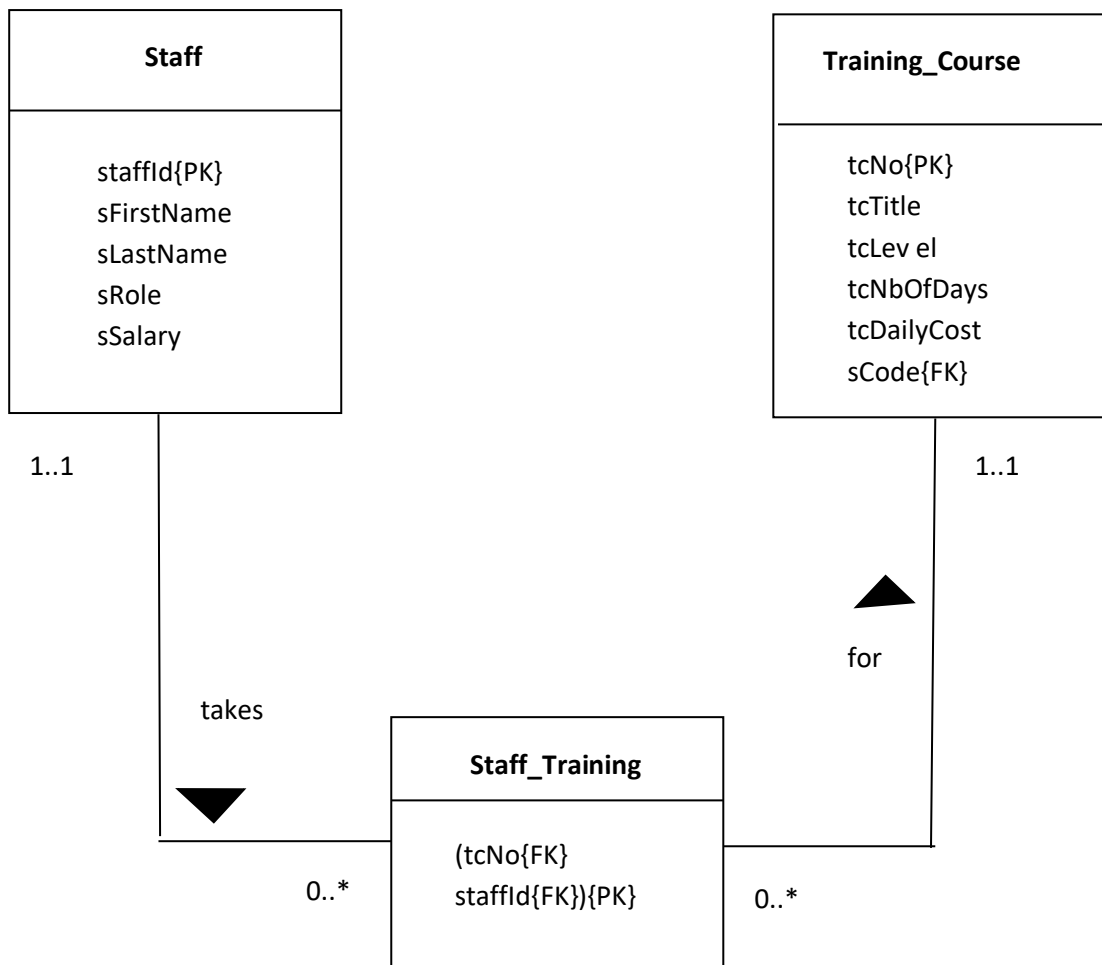
One staff can take many training courses

One training course may be taken by no staffs

One training course can be taken by many staffs

(d) Briefly explain how you would map the relationship 'takes' (between the entities Staff and Training_Course) to a logical ERD. Provide a diagram to support your answer. Make sure you include all the correct attributes and keys. [6 Marks]

This is a many to many relationship. In order to map the conceptual model to logical ERD 3 tables need to be created. In this case Training_Course and Staff are the parent tables and a link table has to be created which has a composite key with the primary keys of both parents.



Question 3

(a) Write a SQL query to display the titles, durations and daily costs of courses at beginner level and courses at intermediate level, but only for those courses that cost more than £250.00 daily. [5 Marks]

```

SELECT tcTitle, tcNbOfDays, tcDailyCost
FROM Training_Course
WHERE (tc_level = 'Beginner' OR tc_level = 'Intermediate')
AND tcDailyCost >= 250.00;
  
```

(b) Write a SQL query to display all the tables in the rectified logical ERD of the above conceptual ERD. Make sure you correctly identify the data types of all the attributes in the tables. [8 Marks]

```
CREATE TABLE Subject
(sCode          VARCHAR(10),
sName           VARCHAR(50) NOT NULL,
sDescrip        VARCHAR(255),
CONSTRAINT      s_sc_pk PRIMARY KEY (sCode)
);
```

```
CREATE TABLE Training_Course
(tcNo           INT (6),
tcTitle         VARCHAR(50) NOT NULL,
tcLevel         VARCHAR(50) NOT NULL,
tcNbOfDays      INT(5),
tcDailyCost     DECIMAL(4,2) NOT NULL,
sCode           VARCHAR(10) NOT NULL,
CONSTRAINT      tc_tcn_pk PRIMARY KEY (tcNo),
CONSTRAINT      tc_tcsc_fk FOREIGN KEY (sCode) REFERENCES Subject(sCode)
);
```

```
CREATE TABLE Staff
(staffId        VARCHAR(10),
sFirstName      VARCHAR(50) NOT NULL,
sLastName       VARCHAR(50) NOT NULL,
sRole           VARCHAR(50) NOT NULL,
sSalary         DECIMAL (5,2) NOT NULL,
CONSTRAINT      st_stid_pk PRIMARY KEY (staffId)
);
```

****** Please note that the following code is to create a link table**

```
CREATE TABLE Staff_Training
(staffId        VARCHAR(10),
tcNo            INT (6),
CONSTRAINT      st_stid_pk PRIMARY KEY (staffId,tcNo),
CONSTRAINT      st_stsid_fk FOREIGN KEY (staffId) REFERENCES Staff(staffId),
CONSTRAINT      st_sttcno_fk FOREIGN KEY (tcNo) REFERENCES Training_Course(tcNo)
);
```