Final Exam Summer

Course Name: Intro To Database

Submitted By:

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BS (SE-8) Section: A

Submitted To:

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Department of Computer Science,
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Final Paper Summer 2020

Course Title: Database Systems
Instructor: Rimsha Khan
Total Marks: 50

NOTE: Understanding the paper is part of solving the paper so no questions will be entertained.

INSTUCTIONS:

1. Write your names and IDs at top of each paper.
2. Write queries on MS Word. No tool required.
3. Convert word to pdf after uploading.

Q1: Perform Normalization upto 3rd Normal Form on the following table. (13marks)

Student_id	Student Name	Student Address	Course_ID	Course_Name	Grade
01	Fawad	Karachi	SE-01	AI	A
			SE-05	SQE	B
02	Waleed	Lahore	SE-02	DIP	C
03	Saira	Peshawar	SE-03	DB	A
			SE-04	SRE	B
04	Aiman	Karachi	SE-03	DB	C
05	Daniyal	Lahore	SE-01	AI	A
06	Emaan	Peshawar	SE-01	AI	B

Answer:

The above Student table is as follow:

Student(Student_id, Student Name, Student Address, Course_ID, Course_Name, Grade)

1NF (First Normal Form) : Each table cell should contain a single value. Each record needs to be unique.

O1 fawad Karachi SE-01 AI A, 02 Waleed Lahore SE-02 DIP C, 03 Saira Peshawar SE-03 DB A, 03 Saira Peshawar SE-04 SRE B, 04 Aiman Karachi SE-03 DB C, 05 Daniyal Lahore SE-01 AI A, 06 Emaan Peshawar SE-01 AI B

The Student ID and Course ID together makes each record unique in the table.

2NF (Second Normal Form) :

A relation that is in First Normal Form and every non-primary-key attribute is fully functionally dependent on the primary key, then the relation is in Second Normal Form (2NF).

In the Student table Student_id is unique and it is the primary key for the table.

The Student Name, Student Address are fully functionally dependent on the primary key. Where as Course ID, Course name and grade are not so.

So we need to split the table as follow:

Student((Student_id[PK][FK], Student Name, Student Address)

Course(Course_ID[PK][FK], Course_Name)

Student_Course(Student_id, Course_ID[PK], Grade)

In the Student table, Student_id is the primary key and foreign key to the Student_Course table. In the Course table, Course_ID is the primary key and foreign key to the Student_Course table. In the Student_Course table, Student_id and Course_ID together forms the primary key.

3NF (Third Normal Form):

A relation is in third normal form, if there is no transitive dependency for non-prime attributes as well as it is in second normal form.

If A->B and B->C are two FDs then A->C is called transitive dependency.

The above tables are in 3NF, since there are no transitive dependency

Q2: Write SQL queries for the following DDL Statements

1. **Write a query to create a table by the name Students which should have the following columns and restrictions: (Marks 10)**

   Column Name: ID Type: integer
   Column Name: Student_Name Type: varchar
   Column Name: DOB Type: DATE
   Column Name: Age Type: Integer
   Column Name: CGPA Type: float

   Restrictions: ID should be the primary key. Student_Name should also be NOT NULL. Maximum value of age should be 30 years.

   Part (1);

   Answer:

```
CREATE TABLE Students (
   ID int NOT NULL PRIMARY KEY,
   Student_Name varchar NOT NULL,
   DOB DATE,
   Age int ,
   CGPA float,
   check (Year between 1 and 30),
);
```

2. **Write 2 SQL DML Queries to insert your data and your friend's data in this Table. (4 marks)**

Part (2);

Answer:

```
INSERT INTO Students (ID,Student_Name,DOB,Age,CGPA)
VALUES (12938, 'Abdul Razzaq', '04-01-1997', 23, 2.9);

INSERT INTO Students (ID,Student_Name,DOB,Age,CGPA)
VALUES (13028, 'Musab Awais', '25-03-1999', 21, 3.18 );
```

3. **Which of the given attributes is a derived attribute and from which attribute it can be derived? (5 marks)**

Part (3);

Answer:

Age is the derived attribute of the given attributes and it can be derived from DOB attribute. Following is the syntax from which it can be derived:

```
Age int AS (year(CURRENT_TIMESTAMP) - year(DOB)
```

Q3: Consider you have the following 2 tables.

Canteen_Table

Product_ID	Product_Name	Category	Mfg_Date	Exp_Date	Unit Price
01	Dairy milk Chocolate	Junk	2, Aug 2019	2, Aug 2020	80 Rs
02	Lipton Tea bags	Not Junk	2 Jan 2019	2 Jan 2020	160 Rs
03	Kurkure	Junk	2 April 2019	2 April 2021	30 Rs
04	Shezan Juice	Junk	3 Aug 2019	3 Aug 2020	30 Rs
05	Chilli Milli Jelly	Junk	3 Jan 2018	3 Jan 2021	5 Rs
06	Olpers Milk	Not Junk	3 April 2018	3 April 2020	350 Rs

Order_Details

Order_Id	Product_ID	Unit Price	Quantity
01	02	160 Rs	1
01	06	350 Rs	1
02	01	80 Rs	2
02	03	30 Rs	2
02	05	5 Rs	2

1. **Write SQL Query for finding/displaying product names and ids of products whose unit price is less than 50 Rs. (4 Marks)**

Part (1);

Answer:

```
Select Product_name, Product_id from Canteen_Table where
Cast (rtrim (Unit_Price,'Rs') as int) < 50;
```

Since we have unit price like 160 Rs, we need to get the price separately to nd the products which are below the unit price 50 rs.
We used rtrim(Unit_Price, 'Rs') which we get as the price value. Then cast is used to convert the price we got which is a varchar type to integer type.

Product_Name	Product_ID
1. Kurkure	3
2. Shezan Juice	4
3. Chilli Milli Jelly	5

2. Write SQL Query for displaying sorted names of product names with Alias name as Product_List_Sorted. (5 Marks)

Part (2);
Answer:

Select Product_Name as Product_List_Sorted from Canteen_Table order by Product_Name asc;

Product_List_Sorted

- Chilli Milli Jelly
- Dairy Milk Choclate
- Kurkure
- Lipton tea bags
- Olpers Milk
- Shezan Juice

3. Delete data from Order_Details whose quantity is less than 1. (4 marks)

Part (3);
Answer:

DELETE FROM Order_Details WHERE Quantity<1;

4. Write SQL INNER JOIN query and its output on the given two tables. (5 marks)

Part (4);

Answer:

Lets nd the Product name Mfg Date Exp Date and sold quantity for the products which are sold.

select Product_Name, Mfg_Date, Exp_Date , Quantity from Canteen_Table C inner join Order_Details O on O.Product_ID = C.Product_ID;

Product_Name	**Mg_Date**	**Exp_Date**	**Quantity**
Lipton Tea Bags	2 Jan 2019	2 Jan 2020	1
Olpers Milk	3 April 2018	3 April 2020	1
Dairy milk Choclate	2 Aug 2019	2 Aug 2020	2
Kurkure	2 Aug 2019	2 April 2021	2
Chilli Milli Jely	3 Jan 2018	3 Jan 2021	2

**********Good Luck☺**********