Name : Muhammad laraib Akhtar

Rollno: 21L-5294

Section : BCS-4B

Course : DataBase Systems

Question 1 (a)

Applications
- applicationNo   integer
- name   varchar (30)
- CompanyNo   integer
- type   varchar(30)

User
- userNo   integer
- user-name   varchar (30)
- email   varchar (30)
- city   varchar (30)
- country   ~~var~~ char ($\frac{\text{30}}{2}$)

Company
- companyNo   integer
- name   varchar (30)
- email   varchar (30)
- address   varchar (50)
- phone   char (11)

Accessed By
- userNo   integer
- applicationNo   integer
- date   Date
- time   time
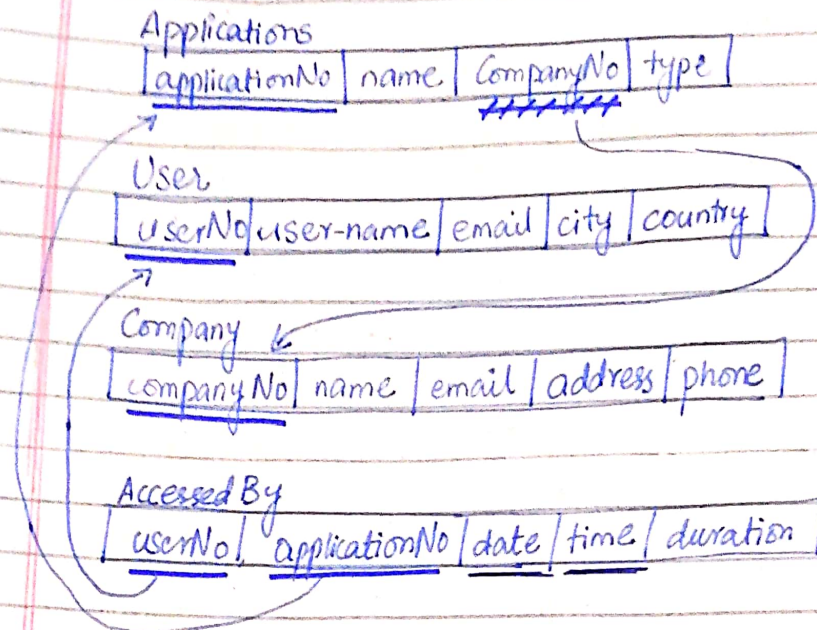- duration   ~~integer~~ time

Question 1 (b)

Applications :   applicationNo, ~~CompanyNo~~

User   :   UserNo

Company   :   CompanyNo

Accessed by :   UserNo, applicationNo, date, time

Question 1(c)

Applications

applicationNo	name	CompanyNo	type

User

userNo	user-name	email	city	country

Company

companyNo	name	email	address	phone

Accessed By

userNo	applicationNo	date	time	duration

Question 1 (d)

Applications:

(1, 'laraib complaint', 1 , 'games')
(2 , 'Hammad Absent', 2 , 'productivity')
(3, 'DC Notice ', 3 , 'kids')

User:

(1 , 'hitman16' , 'laraibakhtar40@gmail.com', 'Okara', 'Pakistan')
(2 , 'Hammad12', '1215273@lhr.nu.edu.pk', 'Lahore', 'Pakistan')
(3 , 'spamX', '1217794@lhr.nu.edu.pk', 'Bawalpur', 'Pakistan')

Company

(1 , 'Ganeify', 'gameify@gmail.com', 'Faisal town', '03247587323')
(2 , 'Prodgeeks', 'prodgeeks@gmail.com', 'Johar town', 03150100830)
(3, 'kidschool', 'kidschool@gmail.com', 'Model town', 03246499012')

Accessed by:

(1, 1, '2020-05-09', '12:15:02', '00:00:15')
(1, 2, '2021-11-30', '13:52:11', '00:01:01')
(2, 3, '2019,-10-1', '01:01:01','01:00:15')

referential integrity constraints:

Accessed by:
(5, 2, '2011-10-1', '02:00:00','00:00:01')

user 5 does not exist.

Entity integrity constraint
(NULL, 'Snapchat', 'Snapchat@snapchat.com', 'California', 'USA')
* primary key cannot be Null.

e). user country constraints: make sure it contains
valid country codes like 'UK', 'US', 'PK'.
. Company Email constraints: make sure table
only contains email addresses from valid domains
e.g '@gmail.com', '@lhr.nu.edu.pk'.
. Company Phone number: The phone number
should be exactly 11 digits.

c) Referential Integrity constraints
Applications:
. Foreign Key (CompanyNo) references Company(CompanyNo)
on update Cascade on Delete ~~cascade~~. cascade.
~~set Null~~
Accessed by:
. Foreign Key (applicationNo) references Applications (applicationNo)
on update cascade on delete ~~cascade~~ set Null
. Foreign Key (userNo) references Appt-User (userNo)
on update cascade on delete ~~cascade~~ set Null

Question 2

1. $R(id, name) \leftarrow \Pi_{EID, Ename}$ Event

2. $R \leftarrow \sigma_{Startdate <= " 2023-01-03" \text{ AND } end\_date >= "2023-01-03"}$ Event

   $\Pi_{EID, Ename, start\_time} R$

3. $R \leftarrow \sigma_{(bdate \geq 1998-02-11" \text{ AND } OID = NULL)}$ Participants.

   $\Pi_{Pname} R$

4. $R \leftarrow$

   $R \leftarrow Organization * (\Pi_{OID} sponsors)$

   $\Pi_{Oname} R$

5. $R \leftarrow \sigma_{Oname = 'Techlogix'}$ Organization

   $R_1 \leftarrow \Pi_{OID} R$

   $R_2 \leftarrow Participants * R_1$

   $R_3 \leftarrow \Pi$

   $R_3 \leftarrow$

   $R_1 \leftarrow \sigma_{Oname = 'Techlogix'}$ Organization

   $R_2 \leftarrow R_1 * Sponsors$

   $R_3 \leftarrow R_2 * Attended$

   $\Pi_{PID} R_3$

6. $R_1 \leftarrow \Pi_{EID} \left(\sigma_{type = 'seminar'} Event \right)$

   $R_2 \leftarrow \Pi_{OID} \left(Sponsors * R_1 \right)$

   $R_3 \leftarrow \left(Organization * R_2 \right)$

   $R_4 \leftarrow Organization - R_3$

   $\Pi_{Oname} R_4$

7. $R_1 \leftarrow {}_{PID} F_{count\ EID}\ Attended$

$\Pi_{PID} \left(\sigma_{count\_EID = 5}\ R_1 \right)$

8.

$\qquad {}_{PID} F_{count\ EID}\ Attended$

9.

$\qquad F_{MIN\ amount,\ MAX\ amount,\ AVERAGE\ amount}\ Sponsers.$

10. —

11. $R_1 \leftarrow \Pi_{EID} \left(\sigma_{type = 'seminar'}\ Event \right)$

$R_2 \leftarrow \Pi_{OID} \left(R_1 * Sponsers \right)$

$R_3 \leftarrow \qquad R_2 * Organization$

$S_1 \leftarrow \Pi_{EID} \left(\sigma_{type = 'workshop'}\ Event \right)$

$S_2 \leftarrow \Pi_{OID} \left(S_1 * Sponsers \right)$

$S_3 \leftarrow \qquad S_2 * Organization.$

$\qquad R_3 * S_3$

12. $R_1 \leftarrow \Pi_{EID} \left(\sigma_{type = 'Seminars'}\ Event \right)$

$R_2 \leftarrow \Pi_{PID} \left(R_1 * Attended \right)$

$R_3\ \Pi_{Pname} \leftarrow \left(R_2 * Participants \right)$

$S_1 \leftarrow \Pi_{EID} \left(\sigma_{type = 'conference'}\ Event \right)$

$S_2 \leftarrow S_1 * Attended$

$S_3 \leftarrow \qquad Attended - S_2$

$S_4 \leftarrow S_3 * Participants$

$$\Pi_{PID}(S_4 * R_3)$$

13. $R_1 \leftarrow \Pi_{EID}(\sigma_{\text{startdate} <= 5\text{-}01\text{-}2023 \text{ AND enddate} >= 5\text{-}01\text{-}2023}\ \text{Event})$

$R_2 \leftarrow \Pi_{PID}(R_1 * \overset{\text{Attended}}{\cancel{\text{Sponsors}}})$

$\cancel{S_1 \leftarrow \Pi_{EID}(\sigma}$

$S_1 \leftarrow \Pi_{PID}(\text{Participants})$

$S_2 \leftarrow \Pi_{PID}\ \text{Attended}$

$T_1 \leftarrow S_1 - S_2$

$R_2 \cup T_1$

14. ~~Insert into Event values (1, 'Nascon', 'Fast Islamabad', 'Seminar', '05-01-2023' '2023-01-05', '2023-01-06', '12:00:00', '06:00:00'~~

14. Insert into Event vales (
    1,
    'Nascon',
    'FAST ISLAMABAD',
    'Seminar',
    '2023-01-05',
    '12:00:00',
    '2023-01-06')
    '06:00:00'
    );

15. Delete from Organization
    where OID = 1;