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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(2)

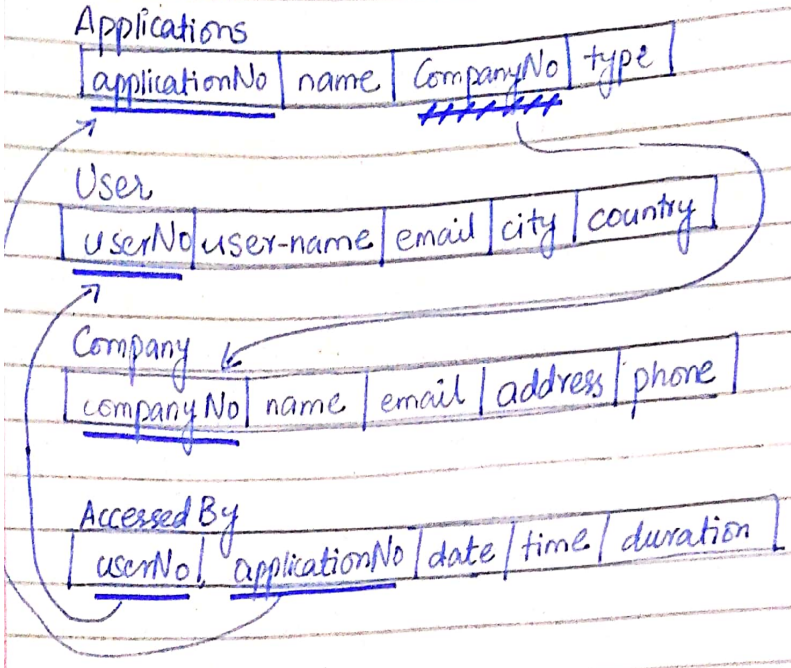
Company
- companyNo integer
- name varchar(30)
- email varchar(30)
- address varchar(50)
- phone char(11)

AccessedBy
- 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

Question 1(c)



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'~~) PK
(2, 'Hammad12', '121573@lhr.nu.edu.pk', 'Lahore', ~~'Pakistan'~~) PK
(3, 'spamX', '121794@lhr.nu.edu.pk', 'Bawalpur', ~~'Pakistan'~~) PK

Company

(1, 'Gameify', 'gameify@gmail.com', 'Faisal town', '03247587323')
(2, 'Prodgeeks', 'prodgeeks@gmail.com', 'Johar town', 03150100630)
(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~~ set Null. cascade.

Accessed by:

- Foreign key (ApplicationNo) references Applications(applicationNo) on update cascade on delete ~~cascade~~ set Null
- Foreign key (UserNo) references ~~Appl~~ User(UserNo) on update cascade on delete ~~cascade~~ Set Null.

Question 2

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

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

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

3. $R \leftarrow \sigma_{bdate > '1998-02-11' \text{ AND } OID = NULL}$ Participants.

$\Pi_{Pname} R$

4. $R \leftarrow$ Organization $* (\Pi_{OID}$ Sponsors$)$

$\Pi_{Oname} R$

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

$R_1 \leftarrow \Pi_{OID} R$

$R_2 \leftarrow$ Participants $* R_1$

$R_3 \leftarrow$

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

$R_2 \leftarrow R_1 *$ Sponsors

$R_3 \leftarrow R_2 *$ Attended

$\Pi_{PID} R_3$

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

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

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

$R_4 \leftarrow$ Organization $- R_3$

$\Pi_{Oname} R_4$

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

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

8. ${}_{PID}F_{count\ EID}(Attended)$

9. $F_{MIN\ amount, MAX\ amount, AVERAGE\ amount}(Sponsers)$.

10. ——

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

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

$R_3 \leftarrow R_2 * Organization$

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

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

$S_3 \leftarrow S_2 * Organization.$

$R_3 * S_3$

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

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

$R_3 \leftarrow (R_2 * Participants)$

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

$S_2 \leftarrow S_1 * Attended$

$S_3 \leftarrow Attended - S_2$

$S_4 \leftarrow S_3 * Participants$

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

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

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

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

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

$S_2 \leftarrow \Pi_{PID}(Attended)$

$T_1 \leftarrow S_1 - S_2$

$R_2 \cup T_1$

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

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

15. Delete From Organization
where OID = 1;