Alexandria University

Faculty of Engineering

Computer Engineering Department

SWE Project

Database Task

Central Student Hub
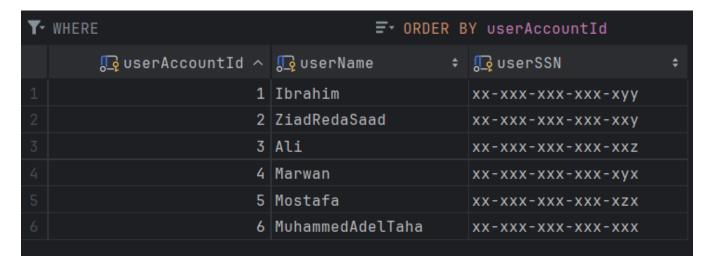
Testing User Account Schema Behavior

Test #1 (Testing the behavior of the auto increment)

The user account id attribute should increase by one every time we insert a new record in the schema.

So, we inserted some arbitrary test cases to illustrate the schema after insertion.

Code

```
use `central-student-hub`;

insert into useraccountkeys (userName, userSSN)
values ('Ibrahim', 'xx-xxx-xxx-xxx-xyy'),
       ('ZiadRedaSaad', 'xx-xxx-xxx-xxx-xxy'),
       ('Ali', 'xx-xxx-xxx-xxx-xxz'),
       ('Marwan', 'xx-xxx-xxx-xxx-xyx'),
       ('Mostafa', 'xx-xxx-xxx-xxx-xzx'),
       ('MuhammedAdelTaha', 'xx-xxx-xxx-xxx-xxx');
```

Output

	userAccountId ∧	userName	userSSN
1	1	Ibrahim	xx-xxx-xxx-xxx-xyy
2	2	ZiadRedaSaad	xx-xxx-xxx-xxx-xxy
3	3	Ali	xx-xxx-xxx-xxx-xxz
4	4	Marwan	xx-xxx-xxx-xxx-xyx
5	5	Mostafa	xx-xxx-xxx-xxx-xzx
6	6	MuhammedAdelTaha	xx-xxx-xxx-xxx-xxx

WHERE ... ORDER BY userAccountId

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Test #2 (Testing that the primary keys should be distinct)

If we insert a record with a primary key that is already in the schema the record should release an error.

From the previous test we have a record with username: Ibrahim, user SSN: xx-xxx-xxx-xxx-xyy.

I tried to insert records that have the same value of one of them or the same value of both and that results in these errors.

```
central-student-hub> insert into useraccountkeys (userName, userSSN)
                     values ('Ibrahim', 'xx-xxx-xxx-xxx-zzz')
[2023-11-16 07:32:36] [23000][1062] Duplicate entry 'Ibrahim' for key 'userName'
[2023-11-16 07:32:36] [23000][1062] Duplicate entry 'Ibrahim' for key 'userName'
central-student-hub> insert into useraccountkeys (userName, userSSN)
                     values ('Mahmoud', 'xx-xxx-xxx-xxx-xyy')
[2023-11-16 07:32:40] [23000][1062] Duplicate entry 'xx-xxx-xxx-xxx-xyy' for key 'userSSN'
[2023-11-16 07:32:40] [23000][1062] Duplicate entry 'xx-xxx-xxx-xxx-xyy' for key 'userSSN'
central-student-hub> insert into useraccountkeys (userName, userSSN)
                     values ('Ibrahim', 'xx-xxx-xxx-xxx-xyy')
[2023-11-16 07:32:45] [23000][1062] Duplicate entry 'Ibrahim' for key 'userName'
[2023-11-16 07:32:45] [23000][1062] Duplicate entry 'Ibrahim' for key 'userName'
```

Test #3

(Testing that we can't add a record in the user account info schema unless we added it before in the user account keys schema)

I tried to insert a record with SSN that doesn't exist in the user account keys schema and that results in this error.

```
central-student-hub> insert into useraccountinfo values ('zz-zzz-zzz-zzz-zzz', 'admin', 'Muhamed', 'Adel', 'moAdel@yahoo.com',
                     '###########', '###########', '2023-11-16')
[2023-11-16 07:42:14] [23000][1452] Cannot add or update a child row: a foreign key constraint fails (`central-student-hub`.`useraccountinfo`,
[2023-11-16 07:42:14] [23000][1452] Cannot add or update a child row: a foreign key constraint fails (`central-student-hub`.`useraccountinfo`,
```

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Test #4

(Testing that we could add a record in the user account info schema only if we added it before in the user account keys schema)

The insertion done successfully when I insert a record with an SSN that exists in the user account keys schema. You can check that this SSN exists by going back to test #1 output screenshot.

```
T WHERE                              ≡ ORDER BY ssn DESC
    ssn              ∨  userType ⇕  firstName ⇕  lastName ⇕  email          ⇕  passwordHash ⇕  passwordSalt ⇕  passwordDate ⇕
1  xx-xxx-xxx-xxx-xxx  admin         Muhamed       Adel        moAdel@yahoo.com ###########     ###########      2023-11-16


central-student-hub> insert into useraccountinfo values ('xx-xxx-xxx-xxx-xxx', 'admin', 'Muhamed', 'Adel', 'moAdel@yahoo.com',
                                                         '###########', '###########', '2023-11-16')
[2023-11-16 07:50:29] 1 row affected in 4 ms
```

Test #5 (Testing that we cannot update the SSN in the user account info schema records)

We cannot update the SSN, because it's a foreign key. The DBMS releases this error when we try this.

```
central-student-hub> update useraccountinfo set ssn = '123466' where userType = 'admin'
[2023-11-16 08:00:56] [23000][1452] Cannot add or update a child row: a foreign key constraint fails (`central-student-hub`.`useraccountinfo`,
[2023-11-16 08:00:56] [23000][1452] Cannot add or update a child row: a foreign key constraint fails (`central-student-hub`.`useraccountinfo`,
```

Test #6

(Testing that we can't delete a record from the user account keys schema unless it's not in the user account info schema)
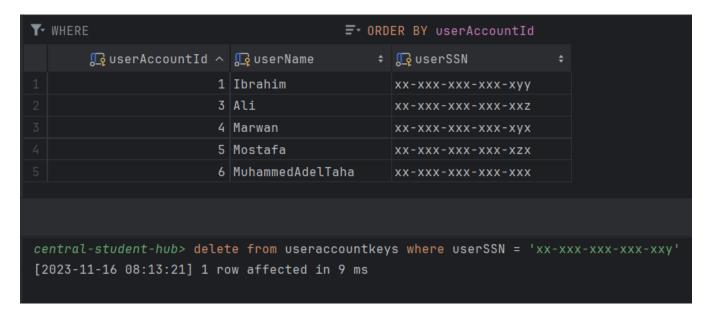
Remember that we had a record with this SSN in the user account info, so the DBMS releases this error.

```
central-student-hub> delete from useraccountkeys where userSSN = 'xx-xxx-xxx-xxx-xxx'
[2023-11-16 08:09:37] [23000][1451] Cannot delete or update a parent row: a foreign key constraint fails (`central-student-hub`.`useraccountinfo`,
[2023-11-16 08:09:37] [23000][1451] Cannot delete or update a parent row: a foreign key constraint fails (`central-student-hub`.`useraccountinfo`,
```

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But if we tried to delete a record with a different SSN it would be deleted with no problems.

After running this command, we will not have Ziad Reda's record anymore because it has been deleted successfully.

	userAccountId ^	userName ⇕	userSSN ⇕
1	1	Ibrahim	xx-xxx-xxx-xxx-xyy
2	3	Ali	xx-xxx-xxx-xxx-xxz
3	4	Marwan	xx-xxx-xxx-xxx-xyx
4	5	Mostafa	xx-xxx-xxx-xxx-xzx
5	6	MuhammedAdelTaha	xx-xxx-xxx-xxx-xxx

```
central-student-hub> delete from useraccountkeys where userSSN = 'xx-xxx-xxx-xxx-xxy'
[2023-11-16 08:13:21] 1 row affected in 9 ms
```

Test #7

(Testing that when modifying the SSN in the user account keys schema it also modifies in the user account info schema)

Remember that the SSN before updating was (xx-xxx-xxx-xxx-xxx).

ssn	userType	firstName	lastName	email	passwordHash	passwordSalt	passwordDate
xx-xxx-xxx-zzz-zzz	admin	Muhamed	Adel	moAdel@yahoo.com	############	############	2023-11-16

```
central-student-hub> update useraccountkeys set userSSN = 'xx-xxx-xxx-zzz-zzz' where userAccountId = 6
[2023-11-16 08:19:21] 1 row affected in 3 ms
```