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| **National University of Computer and Emerging Sciences** |
| In Lab Exercise  “Data Retrieval & Set Operations, Joins, Group By” |
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| Database Systems |
| Fall 2024 |

Department of Computer Science

FAST-NU, Lahore, Pakistan

For this exercise use the following schema, the script to create this schema and populate data is given in ATM.SQL file



**Inlab Exercise**

**Section 1: SELECT FROM WHERE & Set Operations (Approx. 1 Hour)**

* Find the total number of unique users of each card type.
* Show the card numbers and user names whose balance is in the range (Min: 2000, Max: 4000).
* Show the name of those users who do not possess any card.

a) Using a set operation.

* Show the id of those cards along with the card type name and the owner’s name for which no transaction has been carried out in the last year.

a) Using a set operation.

* List all the users who have made no transactions in the year 2023.
* Show the name and id of those users who possess both a credit card and a debit card.

**Optional (Practice):**

* Select users whose card balance is below 1000 and order them by their balance in ascending order.
* List all unique cities where users reside, along with the total number of users in each city.

**Section 2: GROUP BY & ORDER BY (Approx. 1 Hour)**

* For each card type, show the total number of cards whose total sum of transaction amount is greater than 6000.
* Consider only the transactions carried out between 2015 and 2017.
* Show the number of transactions for each card type in descending order, grouped by card type.
* List all users who have never made a transaction.
* Show all card types and their total count for users who live in 'New York' or 'Los Angeles'.
* Show the city name, number of users, and the sum of the balance of users from the same city.
* Display the card numbers and user names for all users whose transactions exceed the average transaction amount of all cards.

**Optional (Practice):**

* List all the cards whose expiry date falls within the current year.
* Show those card pairs that are expiring in the same year.

**Section 3: JOINS, GROUP BY & ORDER BY (Approx. 1 Hour)**

* Show the name of those users who do not possess any card.

b) Using a join.

* Show the id of those cards along with the card type name and the owner’s name for which no transaction has been carried out in the last year.

b) Using a join.

* List the user id, name, phone number, and city of those users whose card is expiring within the next 3 months.
* Also, show the card number along with card type name.
* Show the user id and name of those users whose total balance is equal to or greater than 5000.
* Sum balance if the user has more than one card.
* Show those user pairs whose names’ first characters are the same.
* Show the name and card type of all users who have made a transaction over 10000 in a single transaction.
* Show the user id, name, phone number, city of users whose cards have not been used for transactions in the last year.