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DAB203 Assignment#1

Q1. Explain with an example the Atomicity property of a transaction.

- Atomicity property of a transaction means transaction is completely executed, or nothing is executed.
- No partial transactions should be processed if the transaction can not be processed completely then the partial transactions should be rolled back. Thus, Atomicity means either the transaction is committed completely or rolled back.
- Example: money transfer from one account to another.
- Begin the transaction by marking the start of transaction, first deduct amount from the payee's account.
- then the system adds the same amount to the recipient's account.
- Finally, system verifies if both transactions were successful or not. If it was successful, then system will commit the transaction otherwise it will rollback the transaction to the initial state.
- By ensuring that, the system makes sure that both the payer's and the receiver's accounts are not left in an inconsistent state.

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Q2. Consider set $A = \{0,1,2,3,4,5,6,7,8,9\}$, and construct set B from your student ID as shown below:

Step 1: Only consider numbers, not alphabet.

Step 2: Consider repeating numbers only once.

Step 3: Sort the numbers in Ascending order.

Example: Student ID: A0131262

Step 1: 0131262

Step 2: 01326

Step 3: 01236

Hence, $B = \{0,1,2,3,6\}$

- $A = \{0,1,2,3,4,5,6,7,8,9\}$
- Now, to find B:
 - Student ID: w0827884
 - Step 1: $\{0,8,2,7,8,8,4\}$
 - Step 2: $\{0,8,2,7,4\}$
 - Step 3: $\{0,2,4,7,8\}$
- $B = \{0,2,4,7,8\}$

Q2(i) Show your set B.

- $B = \{0,2,4,7,8\}$

Q2(ii) Show A UNION B.

- A union B is denoted as $A \cup B$. It contains the combined set of unique values from A and B.
- $A \cup B = \{0,1,2,3,4,5,6,7,8,9\}$
- As all the values from B are in A as well, thus we will get set A as our union set.

Q2(iii) Show A UNION ALL B.

- The A union all B contains all the values from both the sets including the duplicate values.
- $A \cup \text{ALL } B = \{0,1,2,3,4,5,6,7,8,9,0,2,4,7,8\}$.

Q2(iv) Show A INTERCEPT B.

- A intercept B is denoted as $A \cap B$. It contains the combined set of common values from A and B.
- $A \cap B = \{0,2,4,7,8\}$
- As all the values from B are in A as well, we will get set B as our intercept set.

Q2(v) Show A EXCEPT B.

- A except B is denoted as $A - B$. It contains the elements from set A which are not in set B.
- $A - B = \{1,3,5,6,9\}$.

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Q3. With an example, show the difference between FULL JOIN and CROSS JOIN.

1) Full JOIN:

- The FULL JOIN combines the results of both left and right outer joins and returns all (matched or unmatched) rows from the tables on both sides of the join clause.
- Full JOIN keeps all the rows from both the tables.
- It includes all rows from both tables, matching rows where possible and filling in NULL values where there is no match.
- Syntax:

```
FROM First_table as first
FULL JOIN Second_table as second
ON first.id = second.id;
```

2) CROSS JOIN:

- Cross join results in an output consisting of all the columns from both the tables and every combination of rows from one table with rows from the other.
- It is the Cartesian product of the two tables. And its not the most used JOIN.
- Cross join can be used with some restrictions (e.g., imposing a relationship between columns in the two tables).
- Syntax:

```
Select * from First_table Cross join Second_table
```

EXAMPLE:

Table 1

ID	Name
1	Rutu
2	Raj

Table 2

ID	Last name
1	Solanki
2	Sol

Full Join:

```
SELECT * FROM Table 1 as first
FULL JOIN Table 2 as second
ON first.id = second.id
```

Cross Join:

```
SELECT * FROM Table 1 CROSS JOIN Table 2
```

Results:

Full Join

ID	Name	ID	Last name
1	Rutu	1	Solanki
2	Raj	2	Sol

Cross Join

ID	Name	ID	Last name
1	Rutu	1	Solanki
1	Rutu	2	Sol
2	Raj	1	Solanki
2	Raj	2	Sol