Task -5

Window Functions VS Group by

- Group by: it aggregate and group rows that have the same values in specified column and return one roe per group

- Window function: performs calculations across a set of rows related to the current row

Clustered VS Non-Clustered index

- Clustered index:

1. A table can have only one Clustered index
2. Actual data stored in the leaf level and ordered.
3. primary Key Creates a clustered index by default.

- Non-Clustered index:

1. Separate structure from the table data that contains a copy of indexed columns and pointer to the actual data in memory
2. A table Can have multiple Non-clustered index
3. slower than Clustered index

Why we are allowed to create one clustered index per table?

clustered index contain the physical order for table so we can't sort data in a multiple ways in the same time

Filtered VS unique index

Unique ->

- Ensure that all values in the indexed columns are unique(like unique constraints)
- Primary Key creates a unique index.
- in each time using insert , database add one row and search in index then check the values in unique and not exist before (Extra Validation Step).
- on another hand using Select is faster because the B-Tree the helps in search and no need to full Table Scan

Filtered ->

- Non-clustered index includes only rows have a specified condition

- improve performance because it applied to only filtered rows

Choose the Right Index:

- If we want a fast insert and we git rid of data later so we can use th default structure and use Heap Structure we don't have to create any index.

ACID:

- Atomicity ensures that Transaction is fully completed or Executed or fully Rolled back if a partial failure occurs without transaction.