Summary CMU - Lec 2

- DBMS is responsible for efficient evakution of the query .
- The way that you can know DBMS is query optimizer .
- IBM’S (International Business Machines) first query language was called “ SQUARE” .
- The minimum language syntax system needs to say that it support SQL is SQL-92 .
- SQL is based on bags (duplicates) not sets .
- NOTES :
  - DML : Data Manipulation Language .
  - DDL : Data Definition Language .
  - DCL : Data Control Language .

- Aggregates : Functions that return a single value from a bag of tuples .
- Functions are :
  - AVG() : Return the average value .
  - MIN() : Return the minimum value .
  - MAX() : Return the maximum value .
  - SUM() : Return the sum of values .
  - COUNT() : Return # of values .
- Aggregate functions can only be used in the SELECT output list .
- LIKE : used for string matching .
- String operators ‘ % ‘ match any substring (empty string) and ‘ _ ‘ match any one character .
- Many DBMSs also have their own unique functions .
- SQL Standard says to use || operator to concatenate two or more strings together .
- Store query results in another table :
  - Table must not already be defined .
  - Table will have the same # of columns with the same types as the input .

- ORDER BY < column * > [ASC | DESC] order the output tuples by the values in one or more of their columns .
- LIMIT < count > [offset]
  - Limit # of tuples returned in output .
  - Can set an offset to return a “ range “ .
- NESTED queries : Queries containing other queries , they are often difficult to optimize .
  - Inner queries can appear any where in query .
- NESTED QUERIES :
  - ALL : must satisfy expression for all rows in the sub-query .
  - ANY : must satisfy expression for at least one row in the sub-query .
  - IN : equivalent to ‘ = ANY () ’ .
  - EXISTS : at least one row is returned .
- Agggregation function : anything that we discussed earlier .
- Special Window functions :
  - ROW-NUMBER () : # of current row .
  - RANK() : order position of the current row .

- The OVER keyword specifies how to group together tuples when computing the window function .
- Use PARTITION BY to specify group .
- Common table expressions : provides away to write auxiliary statements for use in a large query .
- Alternative to nested queries and views .
- SQL is not a dead language .
- You should always strive to compute your answer as single sql statement .