**SQL HANDOUTS**

**Name: ANIROOP GUPTA**

1) **Introduction to Databases**

\* SQL = Structured data like a strict filing cabinet (rigid but reliable)

\* NoSQL = Flexible data storage like a freeform notebook (adaptable but less structured)

\* Database Management = Control room for all your data operations

2) **Normalization**

\* 1NF = One piece of info per cell (no lists in cells)

\* 2NF = No repeating info based on partial keys

\* 3NF = All data depends on the key, nothing else

\* BCNF = Extra-strict version of 3NF for complex keys

3) **Database Management**

\* System Databases = Built-in databases that run the show

\* User Databases = Your custom-made databases for specific needs

4) **Table Management**

\* Data Types = Labels for data (numbers, text, dates)

\* Table Operations = Ways to create, change, or remove data tables

5) **DML Operations**

\* INSERT = Add new rows to tables

\* UPDATE = Change existing data

\* DELETE = Remove unwanted data

\* SELECT = Find and retrieve specific data

6) **Data Integrity & Functions**

\* Integrity Rules = Rules to keep data clean and accurate

\* Functions = Built-in tools to manipulate data

\* Grouping = Organize similar data together

7) **Joins**

\* Inner Join = Shows matching rows only

\* Left Join = All from left table + matches from right

\* Right Join = All from right table + matches from left

\* Full Join = Shows everything from both tables

\* Cross Join = Combines every row with every other row

\* Equi Join = Matches exact values between tables

\* Self Join = Table connects to itself (like finding employee's manager)

8) **Complex Queries**

\* Subqueries = Queries inside other queries

\* EXISTS/ANY/ALL = Ways to test if data meets conditions

\* Set Operations = Methods to combine multiple query results