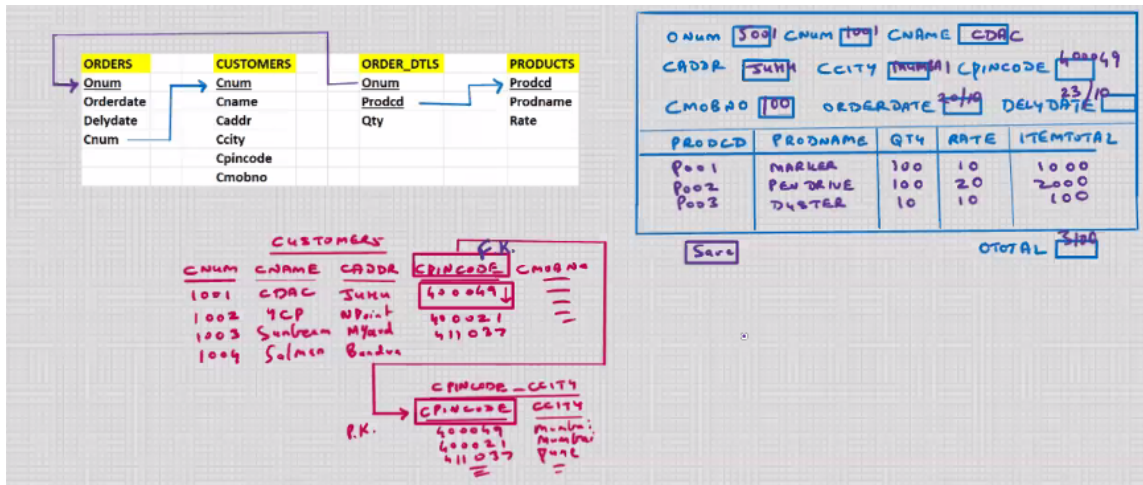# Day_13


```
De-Normalisation
*       if the data is large, if the SELECT statements, you add an extra to
        the column to the table, and store the totals over there
*       normally done for computed columns, expressions, function-based
        columns, summary columns, formula columns, etc.
*       e.g. itemtotal, ototal
```

- to improve the performance, to make the SELECT statement work faster

- in some situations you may want to add an extra table to the application

```
e.g.
DEPTOT
------

DEPTNO   SALTOT
------   ------
1        15000
2         6000
```

- disadvantage of De-Normalisation:
  - DML will be slow

- - DATA redundancy
- advantage of De-normalisation:
  - SELECT statement will be fast

Introduction to NoSQL

- new technology
- Not Only SQL(SQL is not the only language for database problems)(other query languages exist)

History

- earlier we had DBMS
- mid 1980's Rise of the RDBMS

Benefits of RDBMS:

- SQL(common for all RDBMS)(all RDBMS can communicate with each other)
- Data Persistence(RDBMS maintains Read and Write consistency)
- Complex Transactions
- Excellent Reporting tools available e.g. Oracle Reports, Oracle Graphics, Acutate

---

```
Problems with RDBMS model:-
*      Impedance Mismatch -> One logical group of fields in the memory
       is splattered across multiple tables in the database
```

Solution:

- mid 1990's Rise of Object databases, e.g. Oracle etc

Development in the world:

- Early 2000's we have the Rise of the internet

```
Solution:-
*       Scaling Horizontally
*       Lots of little boxes sharing the load

Problem with Sclaing Horizontally:-
*       SQL is not designed to work well with a multi-node system

Solution:-
*       Grid computing and Cloud Computing
```

Definition of NoSQL:

- no definition of NoSQL

Characteristics of NoSQL:

- Open-source

- Non-relational

- Cluster-friendly (ability to run large clusters)(horizontal scalibility)

- 21st Century Web (high traffic websites)

- Schema-less

Data Models:

1. Document database

    - store documents

    - e.g. MongoDB, CouchDB relax, Raven DB

2. Column family database

    - every column is file

        e.g. Cassandra, Apache HBASE

3. Graph database

    - Store graphs, maps

- e.g. Neo4j NoSQL for the Enterprise

4. Key-value database

- based on hashing algorithm

- from the value of the field it will generate the HD address

- designed for fast retrievel

- free HD space has to be allocated in advance

- used for historical data, for Data warehousing applications

  e.g. Project Voldemort A distributed database, riak, redis

What is NoSQL?

→ Type of Database Management System

Various Database Management Systems:

- RDBMS

- OLAP(Online Analytical Processing)

- NoSQL

Objectives of NoSQL:

NoSQL is focused to provide:

- Scalability

- Performance

- High Availability

- Tables

- Structured data

RDBMS vs NoSQL

RDBMS

- more functionalities

- less performance

NoSQL

- Less functionalities
- more performance
- Collections
- Structured and Unstructured data

NoSQL - What is Missing?

- No joins support
- No complex transactions support
- no constraints support

NoSQL- What is Available?

- Query language (Other than SQL)("Not only SQL")
- Fast performance
- Horizontal scalability

When to use NoSQL?