2024_Database Curriculum

Document status	REVIEWED
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Delivered by	Vinsys
Theme	Build
Sub theme	Local development
Module	Data (RDBMS + SQL)
Duration	2 days

Pre-requisites

N/A

Learning Objectives

Upon completion of this module, the participant will be able to:

1. Understand the importance of RDBMS
2. Be able to model and store data in RDBMS tables
3. Be able to write SQL commands to create tables and indexes, keys, insert/update/delete data and query data in a relational DBMS
4. Be able to execute queries using tools such as GUI Oracle SQL Developer/Postgresql.
5. Introduction to PL/SQL. Explain concept of Stored procedures, functions etc.
6. Know the challenges and limitations of RDBMS
7. Introduction to performance tuning for SQL Queries.
8. Be able to choose between RDBMS vs NoSQL databases
9. Know the different types of NoSQL options
10. Know the challenges and limitations of NoSQL

Topics

1. RDBMS (1 day)
    a. Walkthrough on the Service Operations lifecycle
    b. Introduction to key production process focus areas
    c. RDBMS overview covering the need for 2/3 tier architectures and databases as a central store for data
    d. Data Modeling, types and Normalization basics
    e. Tables, relationship, keys and normalization
    f. SQL inserts, updates, select, delete and merge
    g. SQL Query construct - simple select, where clause, order by, group by functions, some important SQL functions for Oracle
    h. Other SQL concepts such as views, indexes, partitions
    i. Exposure to tools such as SQL Developer
    j. Database transactions and overview of ACID properties
    k. Java exercise to cover basic CRUD operations using JDBC which demonstrate connectivity and basic transactions
2. Advanced RDBMS/NoSQL (1 day)
    a. Introduction to PL/SQL. Explain concept of Stored procedures, functions etc.
    b. Introduction to performance tuning for SQL Queries.
    c. Need for NoSQL and brief overview of the different types
    d. Limitations of RDBMS and advantages of NoSQL (covering challenges around unstructured data, schemas, relationships, object relational mapping, horizontal scalability)
    e. High level introduction to Hive database
    f. Basic of document database (MongoDB), covering purpose, use cases, benefits and drawbacks

Pre-reading, Resources, Hands-on sessions / exercises

- RMS-TP New Employee Checklist

- AAR Missing Data issues - CM
- MongoDB on the Cloud
- Connection to CloudSQL
- SQL Queries

Assignments and Evaluations (optional)

Each topic should have hands-on assignments to confirm learnings.