**Day 11: 30-10-2025:**

**Maven :** Maven is known as open source automation build tool.

Build tool is responsible to compile program, run the program, test program, creating jar(.java/.class) or war(html/css/js/xml/jsp/java/.class) file(build file),ear file(EJB), help to download the external dependencies in form of jar file, help to create the documentation.

All build tool provide common project structure which we an use in all java IDE.

Before maven we were using Ant tool.

Maven and Gradle

Maven tool is base upon java technologies and xml base. Maven use pom.xml (project object model). this file contains all configuration details to build the application. We provide configuration details in tag format.

Gradle : Gradle xml less. We build file their we provide configuration details in key-value pairs.

Maven goals

mvn validate

mvn compile

mvn test

mvn package

mvn deploy

mvn install

creating maven project using command prompt

open the command

mvn archetype:generate

default project number 2289 for simple core project -🡪 hit enter

it ask specific version --🡪 hit enter

groupId --🡪 collection of project

artifactId-🡪 Projectname

version 🡪 1.0

package 🡪 com

Y

Maven provide 3 types of repository

1. Local repository
2. Remote repository : it is a public repository
3. Private or organization repository

Pom.xml file first check jar file present in local repository or not base upon dependencies we provided in pom.xml file

By default in window insider user directory .m2 folder which contains all required jar file.

mvn validate : it check the pom.xml file syntax or tag details.

mvn clean : clean the project and it remove target folder.

mvn compile : compile the whole project. It create target folder and keep all .class file.

mvn test : run testing file

mvn package : jar or war file

mvn site : help to create the documentation for your project

which create site folder and inside that folder contains lot of file. Open index.html file to check documentation in html format.

mvn exec:java -Dexec.mainClass="com.App"

**maven life cycle**

mainly divided into 3 sub types

1. default : compile, validate, package, test
2. clean : clean : to clean our old build files
3. site : site : create the documentation.

each life cycle contains one or more than goal.

**Database:**

Store the data

1. file base system
2. database system

File base system limitation

1. data redundancy: store duplicate records.
2. Inconsistency: format of the file .txt, doc, pdf etc.

Id, name, salary

Id name salary

Id/name/salary

1. Security : file can be read, write or update mode.
2. CRUD Operation are more complex : create/insert, update, delete, retrieve etc.

Data: Raw fact

Information : processed data or meaning full data.

Database : it is use to store the data in table format using row and columns (SQL Databases)

DBMS : Database management System: it is a software which help to store the data in table format using row and column.

Database model

Hierarchical model: two file connect with each other top to bottom in unidirectional

Network model : more than one file connected with each other bidirectional.

Relational model : two file or tables are connect with each other using relational concept with PK-FK.

Excel sheet.

TrainerStudent

TId TName tech sid sname age

1 Raj Python 100 Reeta 21

1 Raj Python 101 Meeta 22

1 Raj Java

2 Ravi React JS

3 Rau Spring boot

RDBMS

Dr EF Codd’s rule

Trainer

PK -> Primary key

TID TName tech

1 Raj Python

2 Ravi Java

Student

PK FK

Sid SName Age TId

100 Reeta 21 1

101 Meeta 22 1

103 keeta 23 2

103 Veeta 24 null

RDBMS

MySQL

Oracle

Sql Server

PostGres

Db2

MySQL : is an open source RDBMS database.

To interact with any RDBMS database we need to use SQL (Structured Query language).

SQL mainly divided into 5 types.

1. DRL or DQL (Data query or retrieval language)

Select clause view the records from tables.

1. DDL (Data definition language)

Create, drop, alter, truncate etc : structure of the table

1. DML (Data manipulation language)

Insert, delete and update : deal with data

1. TCL (Transactional control language)

Rollback, savepoint and commit :

1. DCL (Data Control language)

Grant and revoke :

show databases; it show all databases present in your account.

use databasename; move inside an existing database.

show tables; it show all tables present in current database.

desc tableName; using this command you can view table structure

select \* from tableName; it is use to view all records from table

select columnname,columnname from tableName;

it retrieve particular column details.

Syntax to create user defined database

create database databasename

create database upgrade\_db;

use upgrade\_db;

select \* from employee;

select \* from department;

select \* from jobs;

retrieve particular columns

select columnName,columnName from tableName;

**column alias**

select first\_name as fname,salary as emp\_salary from employee;

select concat(first\_name,' ',last\_name) as full\_name ,salary as basic\_salary,salary+5000 as gross\_salary from employee;