MRCET CAMPUS

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS INSTITUTION - UGC, GOVT. OF INDIA)

Affiliated to JNTUH; Approved by AICTE, NBA-Tier 1 & NAAC with A-GRADE | ISO 9001:2015

Maisammaguda, Dhulapally, Komaplly, Secunderabad - 500100, Telangana State, India

LABORATORY MANUAL & RECORD

Name:.....

Roll No:.....Branch:.....

Year:.....Sem:.....

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Certificate

Certified that this is the Bonafide Record of the Work Done by

Mr./Ms.....Roll.No.....of

B.Tech.....year..... Semester for Academic year.....

in.....Laboratory.

Date: Faculty Incharge HOD

Internal Examiner External Examiner

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S.No	Date	Name of the Activity/Experiment	Grade/ Marks	Faculty Signature

DATABASE MANAGEMENT SYSTEM

LAB MANUAL

B.TECH

(III YEAR – I SEM)
(2023-24)

DEPARTMENT OF COMPUTATIONAL INTELLIGENCE

B.TECH (AI&ML)

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)

Recognized under 2(f) and 12 (B) of UGC ACT 1956

(Affiliated to JNTUH, Hyderabad, Approved by AICTE - Accredited by NBA & NAAC – 'A' Grade - ISO 9001:2015 Certified)

Maisammaguda, Dhulapally (Post Via. Hakimpet), Secunderabad – 500100, Telangana State, India

Department of Computational Intelligence

Artificial Intelligence and Machine Learning

Vision

To be a premier centre for academic excellence and research through innovative interdisciplinary collaborations and making significant contributions to the community, organizations, and society as a whole.

Mission

- To impart cutting-edge Artificial Intelligence technology in accordance with industrynorms.
- To instill in students a desire to conduct research in order to tackle challenging technical problems for industry.
- To develop effective graduates who are responsible for their professional growth, leadership qualities and are committed to lifelong learning.

QUALITY POLICY

- To provide sophisticated technical infrastructure and to inspire students to reach their full potential.
- To provide students with a solid academic and research environment for a comprehensive learning experience.
- To provide research development, consulting, testing, and customized training to satisfy specific industrial demands, thereby encouraging self-employment and entrepreneurship among students.

For more information: www.mrcet.ac.in

MALLAREDDYCOLLEGEOFENGINEERING&TECHNOLOGY
Maisammaguda,DhulapallyPost,ViaHakimpet,Secunderabad –500100
DEPARTMENT OF COMPUTATIONAL INTELLIGENCE

GENERAL LABORATORY INSTRUCTIONS

1. Students are advised to come to the laboratory atleast 5 minutes before (to the starting time), those who come after 5minutes will not be allowed into the lab.
2. Plan your task properly much before to the commencement, come prepared to the lab with the synopsis/program/experiment details.
3. Student should enter in to the laboratory with:

a. Laboratory observation notes with all the details (Problem statement, Aim, Algorithm, Procedure, Program, Expected Output,etc.,)filled in for the lab session.
b. Laboratory Record updated upto the last session experiments and other utensils (if any) needed in the lab.
c. Proper Dress code and Identity card.

4. Sign in the laboratory login register, write the TIME-IN, and occupy the computer system allotted to you by the faculty.
5. Execute your task in the laboratory, and record the results/output in the lab observation note book, and get certified by the concerned faculty.
6. All the students should be polite and cooperative with the laboratory staff, must maintain the discipline and decency in the laboratory.
7. Computer labs are established with sophisticated and high end branded systems, which should be utilized properly.
8. Students/Faculty must keep their mobile phones in SWITCHED OFF mode during the lab sessions. Misuse of the equipment, misbehaviors with the staff and systems etc., will attract severe punishment.
9. Students must take the permission of the faculty in case of any urgency to go out; if anybody found loitering outside the lab/class without permission during working hours will be treated seriously and punished appropriately.
10. Students should LOG OFF/SHUT DOWN the computer system before he/she leaves the lab after completing the task (experiment) in all aspects. He/she must ensure the system/seat is kept properly.

Head of the Department **Principal**

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Hierarchical Model

This model is like a hierarchical tree structure, used to construct a hierarchy of records in the form of nodes and branches. The data elements present in the structure have Parent-Child relationship. Closely related information in the parent-child structure is stored together as a logical unit. A parent unit may have many child units, but a child is restricted to have only one parent.

The drawbacks of this model are:

- The hierarchical structure is not flexible to represent all the relationshipproportions, which occur in the real world.
- It cannot demonstrate the overall data model for the enterprise because of the non-availability of actual data at the time of designing the data model.
- It cannot represent the Many-to-Many relationship.

Network Model

- It supports the One-To-One and One-To-Many types only. The basic objects in this model are Data Items, Data Aggregates, Records and Sets.
- It is an improvement on the Hierarchical Model. Here multiple parent-child relationships are used. Rapid and easy access to data is possible in this model due to multiple access paths to the data elements.

Relational Model

- Does not maintain physical connection between relations Data is organized in terms of rows and columns in a table
- The position of a row and/or column in a table is of no importance The intersection of a row and column must give a single value

Features of an RDBMS

- The ability to create multiple relations and enter data into them An attractive query language
- An RDBMS product has to satisfy at least Seven of the 12 rules of Code to be accepted as a full- fledged RDBMS.

Relational Database Management System

RDBMS is acronym for Relation Database Management System. Dr. E. F. Codd first introduced the Relational Database Model in 1970. The Relational model allows data to be represented in a simple row-column. Each data field is considered as a column and each record is considered as a row. Relational Database is more or less similar to Database Management S ystem. In relational model there is relation between their data elements. Data is stored in tables. Tables have columns, rows and names. Tables can be related to each other if each has a column with a common type of information. The most famous RDBMS packages are Oracle, Sybase and Informix.

Simple example of Relational model is as follows :

StudentDetailsTable

Roll_no	Sname	S_Address
1	Rahul	Satelite
2	Sachin	Ambawadi
3	Saurav	Naranpura

StudentMarksheetTable

Rollno	Sub1	Sub2	Sub3
1	78	89	94
2	54	65	77
3	23	78	46

Here, both tables are based on students details. Common field in both tables is Rollno. So we can say both tables are related with each other through Rollno column.

Degree of Relationship

One to One (1:1)

One to Many or Many to One (1:M / M:
1) Many to Many (M: M)

The Degree of Relationship indicates the link between two entities for a specified occurrence of each.

One to One Relationship: (1:1)11

Student Has RollNo.

One student has only one Rollno. For one occurrence of the first entity, there can be, at the most one related occurrence of the second entity, and vice-versa.

One to Many or Many to One Relationship: (1:M/M: 1)1M

Course Contains Students

As per the Institutions Norm, One student can enroll in one course at a time however, in one course, there can be more than one student. For one occurrence of the first entity there can exist many related occurrences of the second entity and for every occurrence of the second entity there exists only one associated occurrence of the first.

Many to Many Relationship: (M:M)MM

Students Appears Tests

The major disadvantage of the relational model is that a clear-cut interface cannot be determined. Reusability of a structure is not possible. The Relational Database now accepted model on which major database system are built.

Oracle has introduced added functionality to this by in corporate object-oriented capabilities. Now it is known is as Object Relational Database Management System (ORDBMS). Object-oriented concept is added in Oracle8.

Some basic rules have to be followed for a DBMS to be relational. They are known as Codd's rules, designed in such a way that when the database is ready for use it encapsulates the relational theory to its full potential. These twelve rules are as follows.

E. F. Codd Rules

1. The Information Rule

All information must be store in table as data values.3

2. The Rule of Guaranteed Access

Every item in a table must be logically addressable with the help of a table name.

3. The systematic Treatment of Null Values

The RDBMS must be taken care of null values to represent missing or inapplicable information.

4. The Database Description Rule

ption of database is maintained using the same logical structures with

ata was defined by the RDBMS.

5. Comprehensive Data Sub Language

According to the rule the system must support data definition, view definition, data manipulation, integrity constraints, authorization and transaction management operations.

6. The View Updating Rule

All views that are theoretically updatable are also updatable by the system.

7. The Insert and Update Rule

This rule indicates that all the data manipulation commands must be operational on sets of rows having a relation rather than on a single row.

8. The Physical Independence Rule

Application programs must remain unimpaired when any changes are made in storage representation or access methods.

9. The Logical Data Independence Rule

The changes that are made should not affect the user's ability to work with the data. The change can be splitting table into many more tables.

10. The Integrity Independence Rule

The integrity constraints should store in the system catalog or in the database.

11. The Distribution Rule

The system must be access or manipulate the data that is distributed in other systems.

12. The Non-subversion Rule

If a RDBMS supports a lower level language then it should not bypass any integrity constraints defined in the higher level.

Object Relational Database Management System

Oracle8 and later versions are supported object-oriented concepts. A structure once created can be reused is the fundamental of the OOP's concept. So we can say Oracle8 is supports Object

Relational model, Object - oriented model both. Oracle products are based on a concept known as a client-server technology. This concept involves segregating the processing of an application between two systems. One performs all activities related to the database (server) and the other performs activities that help the user to interact with the application (client). A client or front-end database application also interacts with the database by requesting and receiving information from database server. It acts as an interface between the user andthe database.

The database server or back end is used to manage the database tables and also respond to client requests.

Introduction to ORACLE

ORACLE is a powerful RDBMS product that provides efficient and effective solutions for major database features. This includes:

- Large databases and space management control
- Many concurrent database users
- High transaction processing performance
- High availability
- Controlled availability
- Industry accepted standards
- Manageable security
- Database enforced integrity
- Client/Server environment
- Distributed database systems
- Portability
- Compatibility

An ORACLE database system can easily take advantage of distributed processing by using its Client/ Server architecture. In this architecture, the database system is divided into two parts: **A front-end or a client portion.** The client executes the database application that accesses database information and interacts withthe user.

A back-end or a server portion

The server executes the ORACLE software and handles the functions required for concurrent, shared data access to ORACLE database.

ILLUSTRATION:ROADWAY TRAVELS

"RoadwayTravels"isinbusinesssince 1977withseveralbusesconnectingdifferentplacesinIndia.ItsmainofficeislocatedinHyderabad. Thecompanywantstocomputerizeitsoperationsinthefollowingareas:

Reservations
Ticketing
Cancellations

Reservations:

Reservationsare directlyhandeledbybookingoffice.reservationscanbemade60daysin advance in either cash or credit. In case the ticket is not available,a wait listed ticket is issuedtothecustomer.Thisticketisconfirmedagainstthecancellation.

Cancellationand modification:

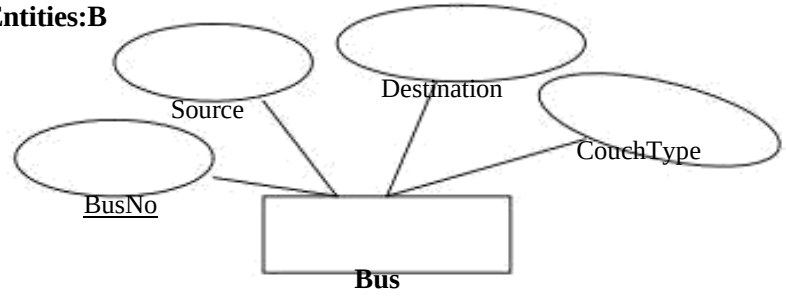
Cancellations are also directly handed at the booking office. Cancellation chargeswillbecharged.
Waitlistedticketsthatdonotgetconfirmedarefullyrefunded.

WEEK-1

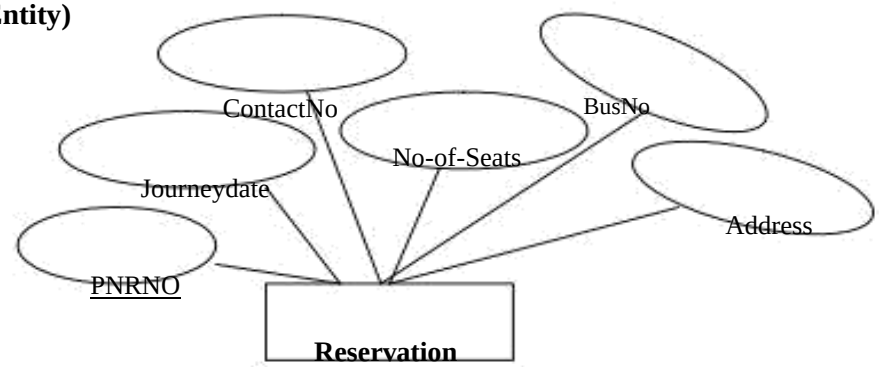
AIM:Analyze the problem andcome withthe entitiesinit.
IdentifywhatDatahastobepersistedinthedatabases.
The Followingare theentities:

1. **Bus**
2. **Reservation**
3. **Ticket**
4. **Passenger**
5. **Cancellation**

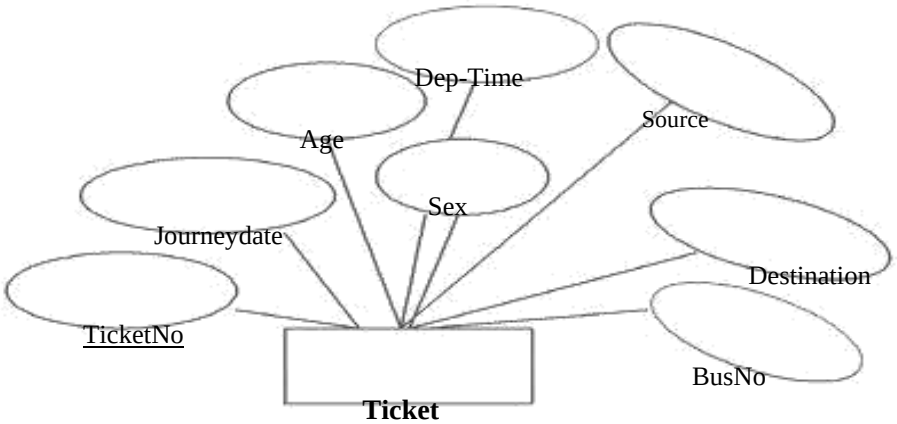
TheattributesintheEntities:Bus:(Entity)



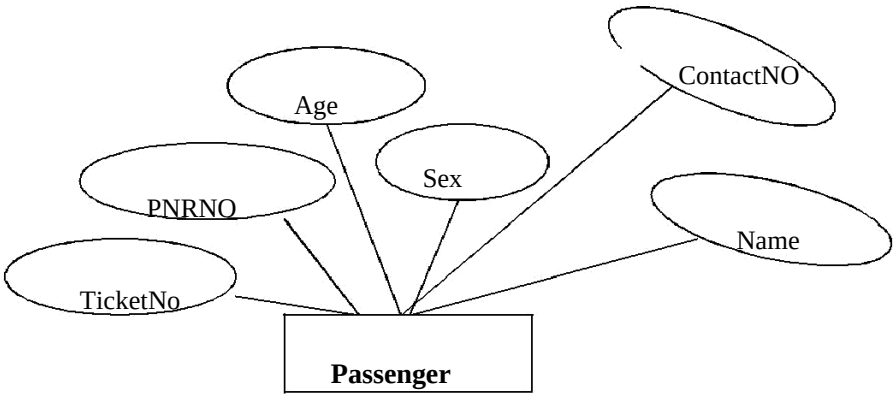
Reservation(Entity)



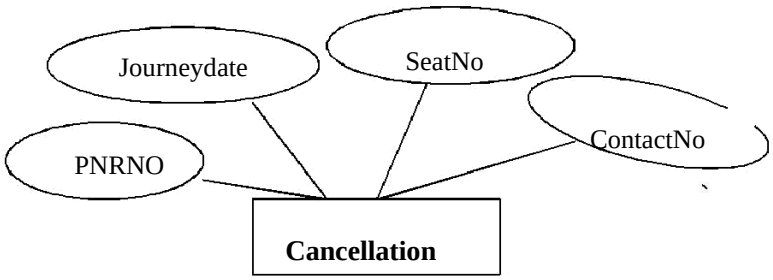
Ticket:(Entity)



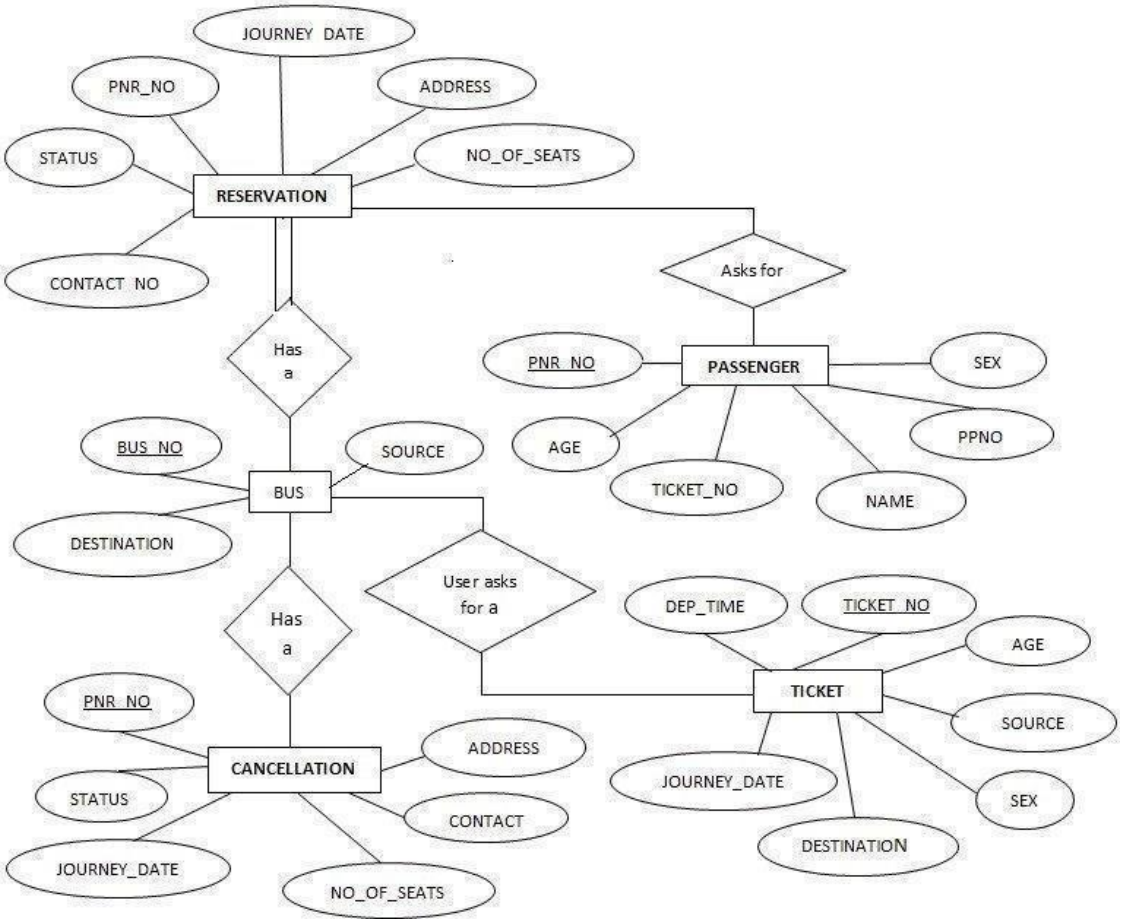
Passenger:



Cancellation(Entity)



ConceptdesignwithE-R Model:



CASESTUDY1:

Considerthefollowinginformationaboutauniversitydatabase:

- ProfessorshaveanSSN,aname,anage,arank,andaresearchspecialty.
- Projectshaveaprojectnumber,asponsorname(e.g.,NSF),astartingdate,anending date,and abudget.
- GraduatestudentshaveanSSN,aname,anage,andadegreeprogram(e.g., M.S.orPh.D.).
- Eachprojectismanagedbyoneprofessor(knownastheproject'sprincipalinvestiga tor).
- Eachproject isworkedonbyoneormoreprofessors(knownastheproject'sco-investigators).
- Professorscanmanageand/orworkonmultipleprojects.
- Each project is worked on by one or more graduate students (known as theproject'sresearchassistants).
- Whengraduatestudentsworkonaproject,aprofessormustsupervisetheir workon the project. Graduate students can work on multiple projects, in which casetheywill havea(potentiallydi_erent)supervisorforeachone.
- Departmentshaveadepartmentnumber,adepartmentname,andamainoffice.
- Departmentshaveaprofessor(knownasthechairman)whorunsthedepartment.
- Professorsworkinoneormoredepartments,andforeachdepartmentthattheyworkin ,atimepercentageisassociatedwiththeirjob.
- Graduatestudentshaveonemajordepartmentinwhichtheyareworkingontheirdegree .
- Eachgraduatestudenthasanother,moreseniorgraduatestudent(knownasastude ntadvisor)whoadviseshimorheronwhatcoursestotake.

WORKSHEET

Weekly Evaluation

0:NotDone ☐ 1:Incomplete ☐ 2:Latecomplete ☐

3:Needsimprovement ☐ 4: Complete ☐ 5:WellDone ☐

Signature of the instructor ☐ Date: ☐ \ ☐ \ ☐

What is SQL and SQL*Plus

Oracle was the first company to release a product that used the English-based Structured QueryLanguage or SQL. This language allows end users to manipulate information of table(primarydatabase object). To use SQL you need not to require any programming experience. SQL is astandard language common to all relational databases. SQL is database language used for storingand retrieving data from the database. Most Relational Database Management Systems provideextension to SQL to make it easier for application developer. A table is a primary object ofdatabaseusedtostoredata.Itstoresdatainformofrowsandcolumns.

SQL*PlusisanOracletool(specificprogram)whichacceptsSQLcommandsandPL/SQLblocksand executes them. SQL *Plus enables manipulations of SQL commands and PL/SQL blocks. Italso performs additional tasks such as calculations, store and print query results in the form ofreports,listcolumndefinitionsofanytable,accessandcopydatabetweenSQLdatabasesandsend messages to and accept responses from the user. SQL *Plus is a character based interactivetool,thatrunsinaGUIenvironment.Itisloadedontheclientmachine.

Tocommunicate withOracle,SQL supportsthefollowingcategoriesofcommands:

1. **DataDefinitionLanguage**

Create, Alter,DropandTruncate

2. **DataManipulationLanguage**

Insert,Update,DeleteandSelect

3. **TransactionControlLanguage**

Commit, RollbackandSavepoint

4. **DataControlLanguage**

GrantandRevoke

Before we take a look on above-mentioned commands we will see the data types available inOracle.

OracleInternalDatatypes

When you create a table in Oracle, a few items should be important, not only do you have to giveeach table a name(e.g. employee, customer), you must also list all the columns or fields (e.g.First_name, Mname, Last_name) associated with the table. You also have to specify what type ofinformation thattable will hold to the database. For example, the column Empno holds numericinformation.AnOracledatabasecanholdmanydifferenttypesofdata.

Datatype Description

Char(Size)Storesfixed-lengthcharacterdatatostore alphanumericvalues,withamaximumsizeof2000bytes.Defaultandminimumsizeis1byte.

Varchar2(Size)Storesvariable-lengthcharacterdatatostore alphanumeric values,withmaximumsizeof 4000bytes.

char(Size) Stores fixed-length character data of length size characters or bytes, dependingon the choice of national character set. Maximum size if determined by the number of bytesrequired storing each character with an upper limit of 2000 bytes. Default and minimum size is 1characteror1byte,dependingonthecharacter set.

Nvarchar2(Size) Storesvariable-lengthcharacterstringhavingmaximumlengthsizecharacters or bytes, depending on the choice of national character set. Maximum size isdeterminedbythenumberofbytesrequiredtostoreeachcharacter,withanupperlimit of4000bytes.

LongStores variable-lengthcharacterdataupto2GB(Gigabytes).Itslenthwouldbe restrictedbasedonmemoryspace availableinthecomputer.

Number [p,s] Number having precision p and scale s. The precision p indicates totalnumber of digit varies from 1 to 38. The scale s indicates number of digit in fraction partvariesfrom-84to127.

DateStores dates fromJanuary1,4712B.C.toDecember31,4712A.D.Oracle predefineformatofDatedatatypeisDD-MON-YYYY.

Raw (Size) Stores binary data of length size. Maximum size is 2000 bytes. One musthave to specify size with RAW type data, because by default it does not specify any size.**LongRawStorebinarydataof variablelengthup to2GB(Gigabytes).**

LOBS-LARGEOBJECTS

LOB is use to store unstructured information such as sound and video clips, pictures upto 4 GBsize.

CLOB A Character Large Object containing fixed-width multi-byte characters.Varying-

widthcharactersetsarenotsupported.Maximumsizeis4GB.

NCLOB A National Character Large Object containing fixed-width multi-bytecharacters.

Varying-

widthcharactersetsarenotsupported.Maximumsizeis4GB.Storesnationalcharacter setdata.

BLOBTostoreaBinaryLargeObjectsuchagraphics,videoclipsandsoundfiles.

Maximumsizeis4GB.

BFILEContainsalocatortoalarge BinaryFilestoredoutsidethedatabase.

EnablesbytestreamI/OaccesstoexternalLOBsresidingonthedatabaseserver.Maximum sizeis4GB.Apartfromoracleinternaldatatypes,usercancreatetheirowndatatype,whichisusedindata baseandotherdatabaseobject.Wewilldiscussitinthelater part.

Thefollowingaretabularrepresentationoftheaboveentitiesandrelationships

BUS:

COLUMNNAME	DATATYPE	CONSTRAINT
BusNo	varchar2(10)	**PrimaryKey**
Source	varchar2(20)	
Destination	varchar2(20)	
CouchType	varchar2(20)	

Reservation:

COLUMNNAME	**DATATYPE**	**CONSTRAINT**
PNRNo	number(9)	**PrimaryKey**
Journeydate	Date	
No-of-seats	integer(8)	
Address	varchar2(50)	
ContactNo	Number(9)	Shouldbeequalto10 numbersandnotallow otherthannumeric
BusNo	varchar2(10)	**Foreignkey**
Seatno	Number	

Ticket:

COLUMNNAME	**DATATYPE**	**CONSTRAINT**
Ticket_No	number(9)	**PrimaryKey**
Journeydate	Date	
Age	int(4)	
Sex	Char(10)	
Source	varchar2(10)	
Destination	varchar2(10)	
Dep-time	varchar2(10)	
BusNo	Number2(10)	

Passenger:

COLUMNNAME	**DATATYPE**	**CONSTRAINT**
PNRNo	Number(9)	**PrimaryKey**
TicketNo	Number(9)	Foreignkey
Name	varchar2(15)	
Age	integer(4)	
Sex	char(10)	(Male/Female)
Contactno	Number(9)	Shouldbeequalto10numbers andnotallowotherthan numeric

Cancellation:

COLUMNNAME	**DATATYPE**	**CONSTRAINT**
PNRNo	Number(9)	Foriegn-key
Journey-date	Date	
Seatno	Integer(9)	
Contact_No	Number(9)	Shouldbeequalto10numbers andnotallowotherthan numeric

Record-Notes

WEEK-2

AIM:InstallationofMySQLandpracticingDDL&DMLcommands.

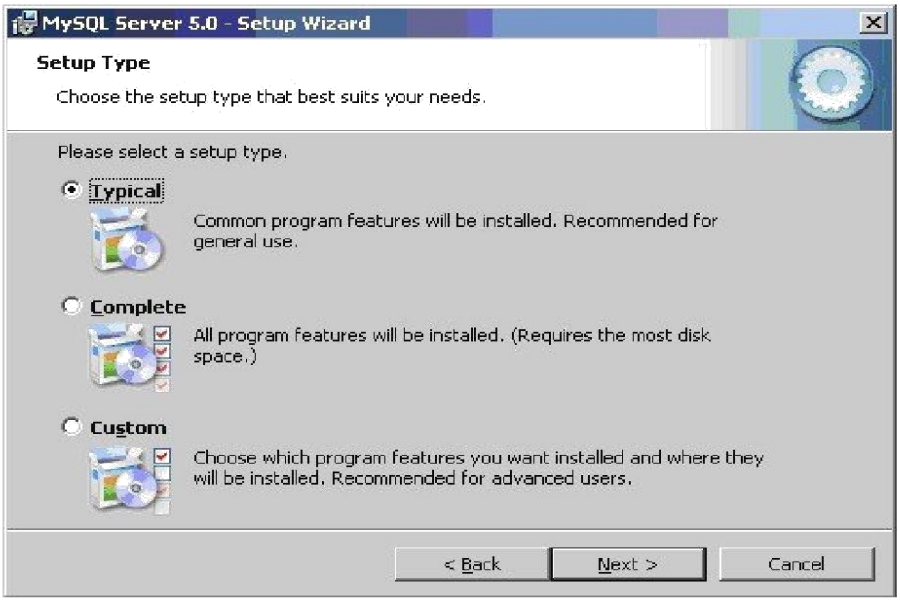
1.StepsforinstallingMySQL

Step1

Make sure you already downloaded the **MySQL essential 5.0.45 win32.msi file**. Double clickonthe.msifile.

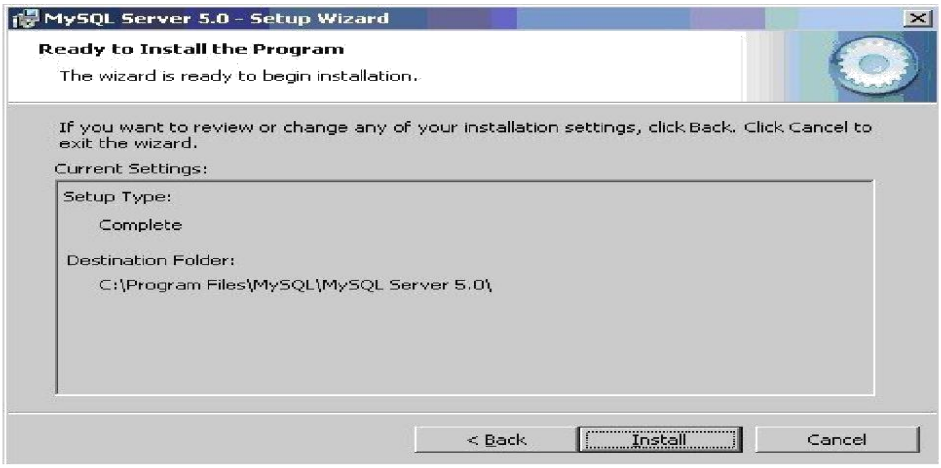
Step2

This is MySQL Server 5.0 setup wizard. The setup wizard will install MySQL Server 5.0release5.0.45onyourcomputer.Tocontinue,click**next.**



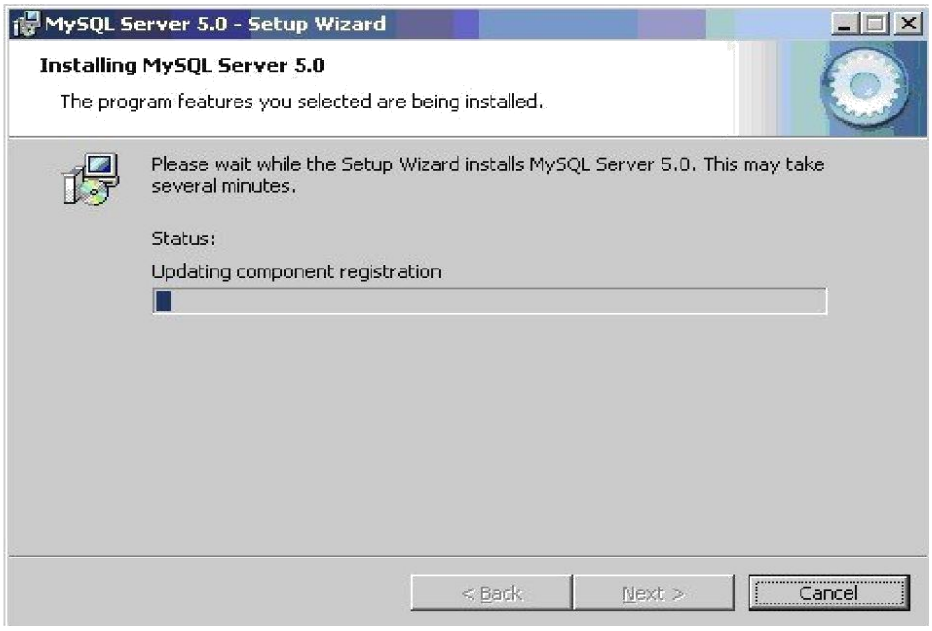
Step3

Choose thesetuptypethatbestsuitsyourneeds. Forcommonprogramfeaturesselect***Typical*** andit'srecommendedforgeneraluse.Tocontinue,click**next**.



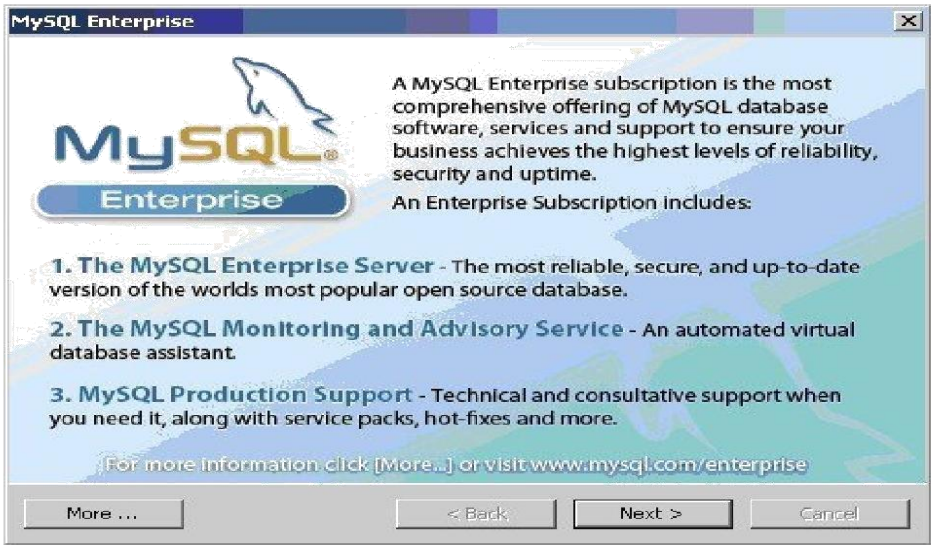
Step4

This wizard is ready to begin installation. Destination folder will be in **C:\ProgramFiles\MySQL\MySQLServer5.0**.Tocontinue,click**next**.



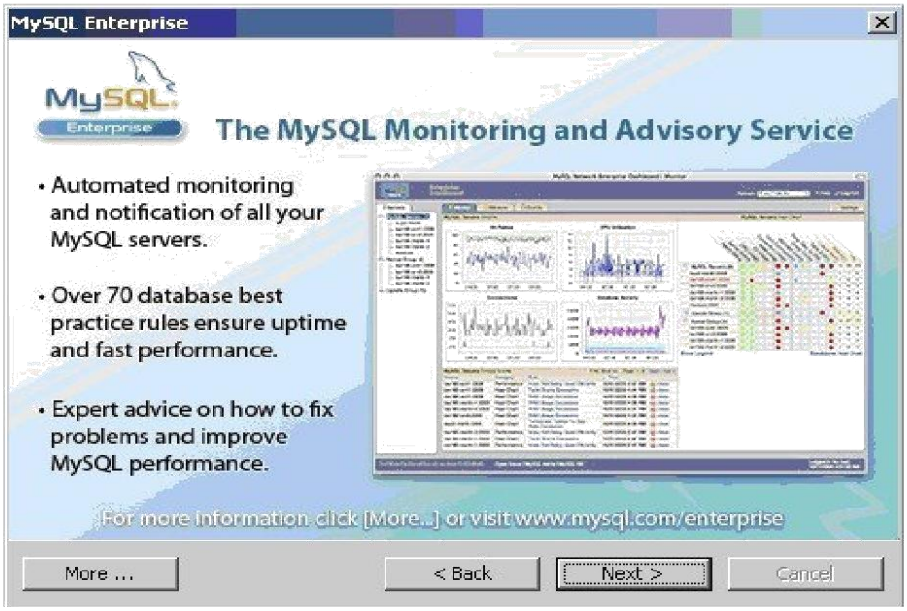
Step5

Theprogramfeaturesyouselectedarebeinginstalled.PleasewaitwhilethesetupwizardinstallsMySQL5.0.Thismaytakeseveralminutes.



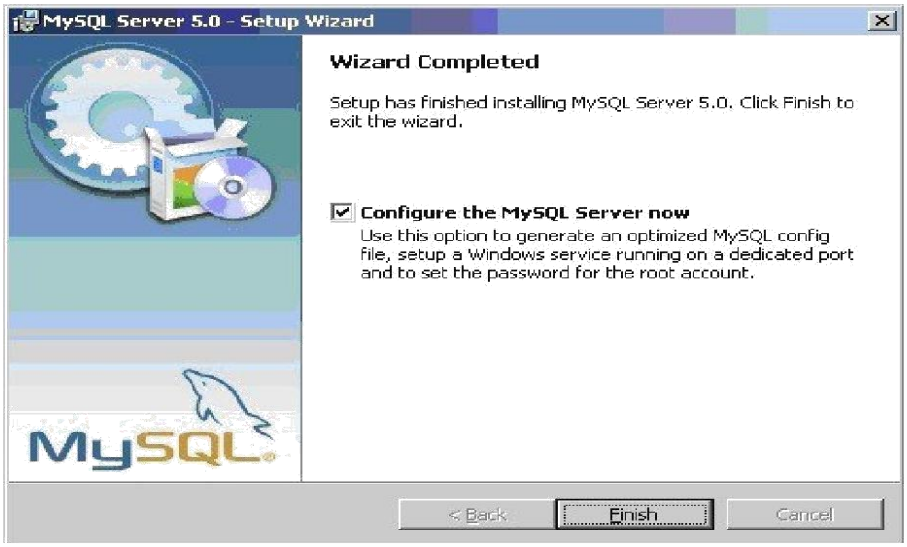
Step6

Tocontinue,click**next**.



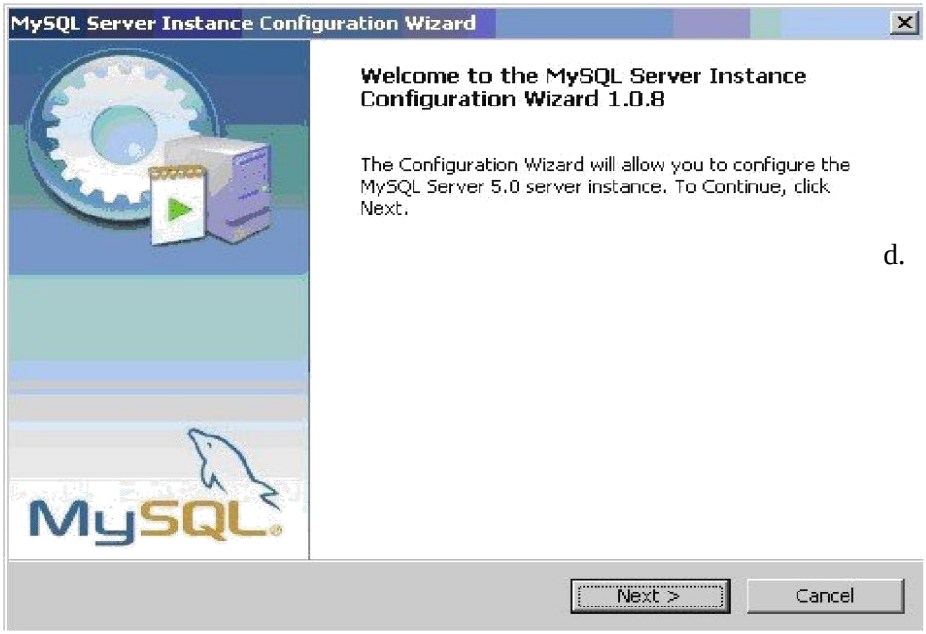
Step7

Tocontinue,click**next**.



Step8

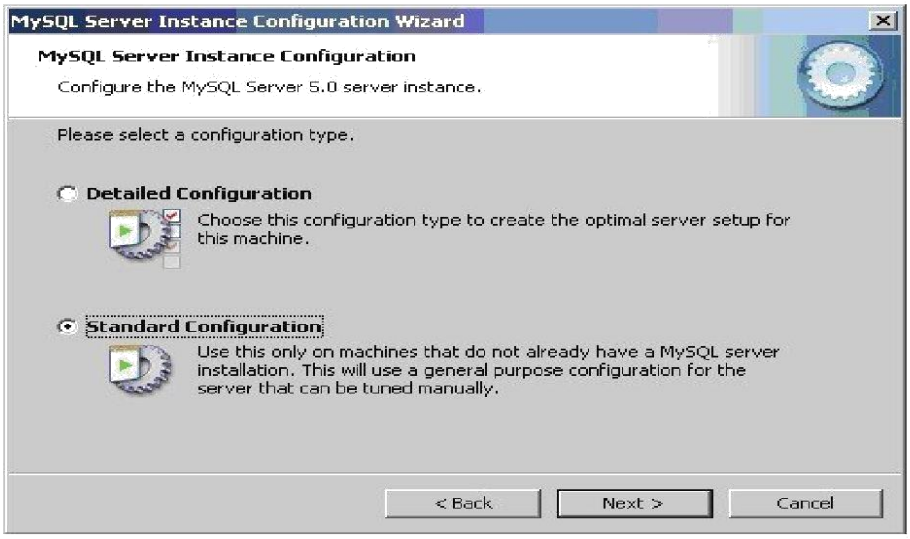
Wizard Completed. Setup has finished installing MySQL 5.0. **Check** the configure the MySQLserver nowtocontinue.Click**Finish**toexitthewizard



d.

Step9

Theconfigurationwizardwillallowyoutoconfiguretheserverinstance.Tocontinue,click**next**.

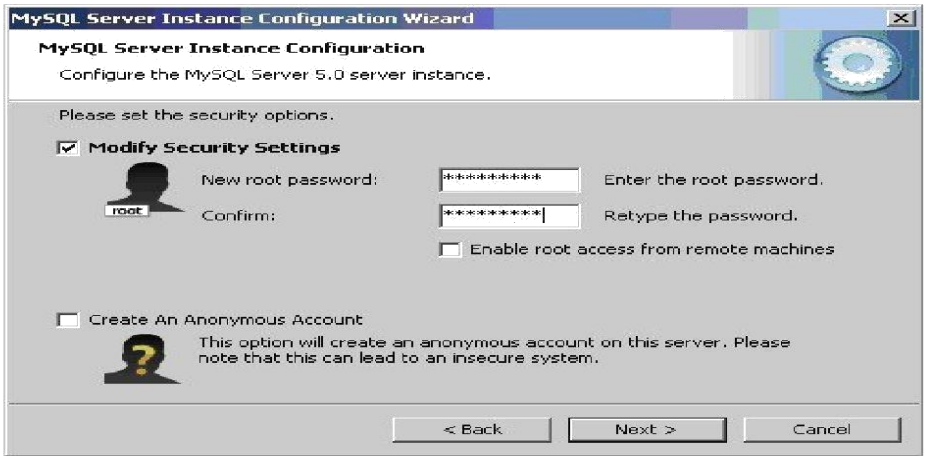


Step10

Select a **standard configuration** and this will use a general purpose configuration fortheserverthatcanbetunedmanually.Tocontinue,click**next**.

Step11

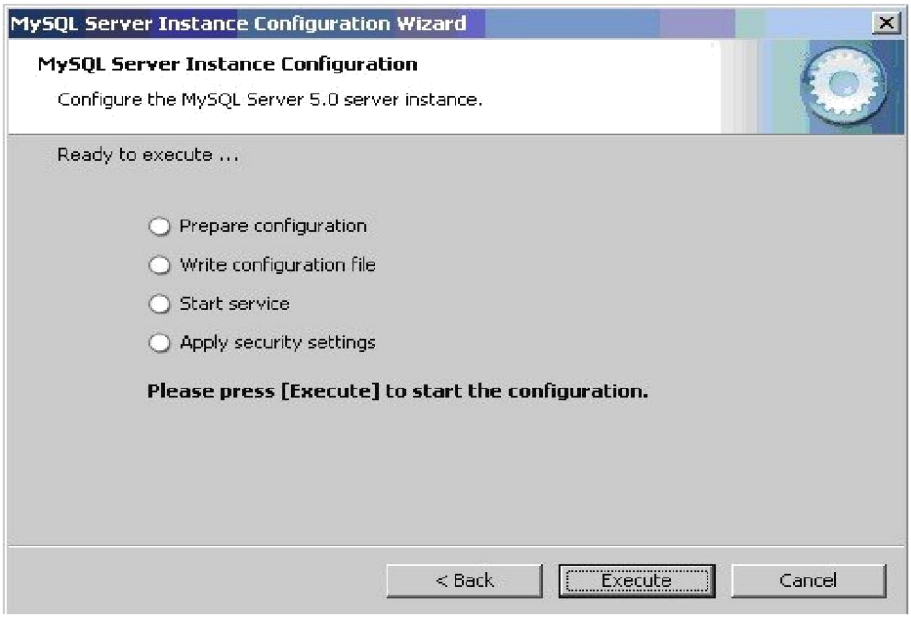
Check on the **install as windows service** and **include bin directory in windows path**. Tocontinue,click**next**.



Step12

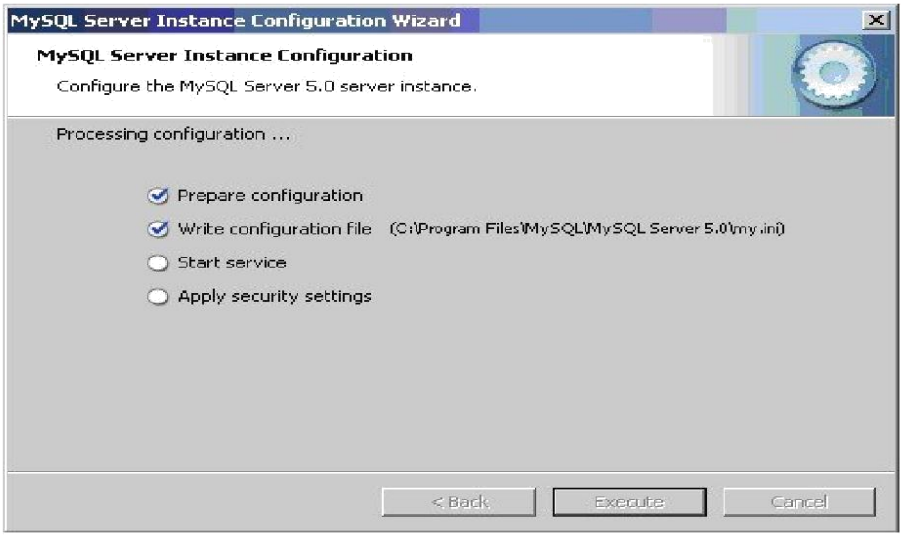
Pleasesetthesecurityoptionsbyenteringtherootpasswordandconfirmretypethepassword.

continue,clicknext.



Step13

Readytoexecute?Clicks**execute**tocontinue.

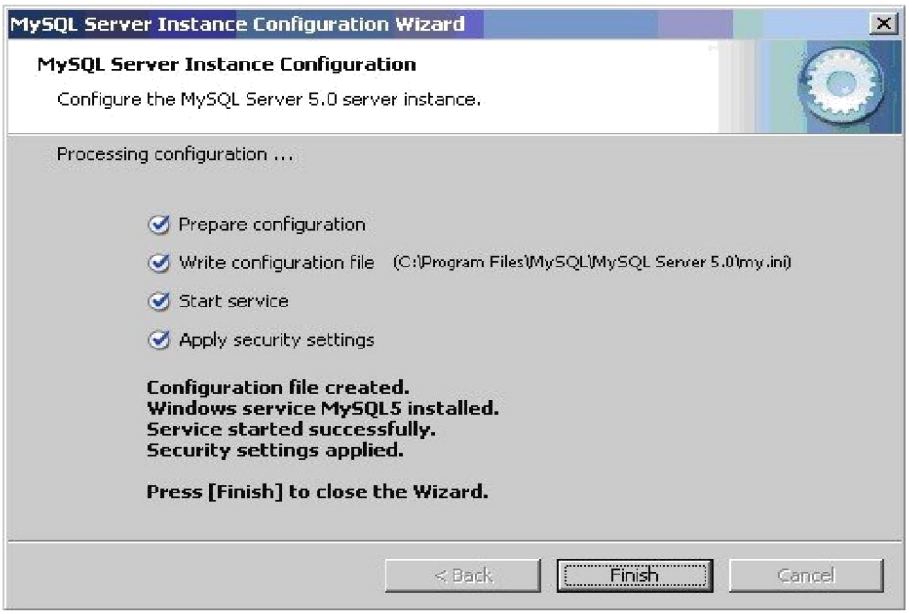


Step14

Processingconfigurationinprogress.

Step15

Configuration file created. Windows service MySQL5 installed. Press **finish** to close thewizard.



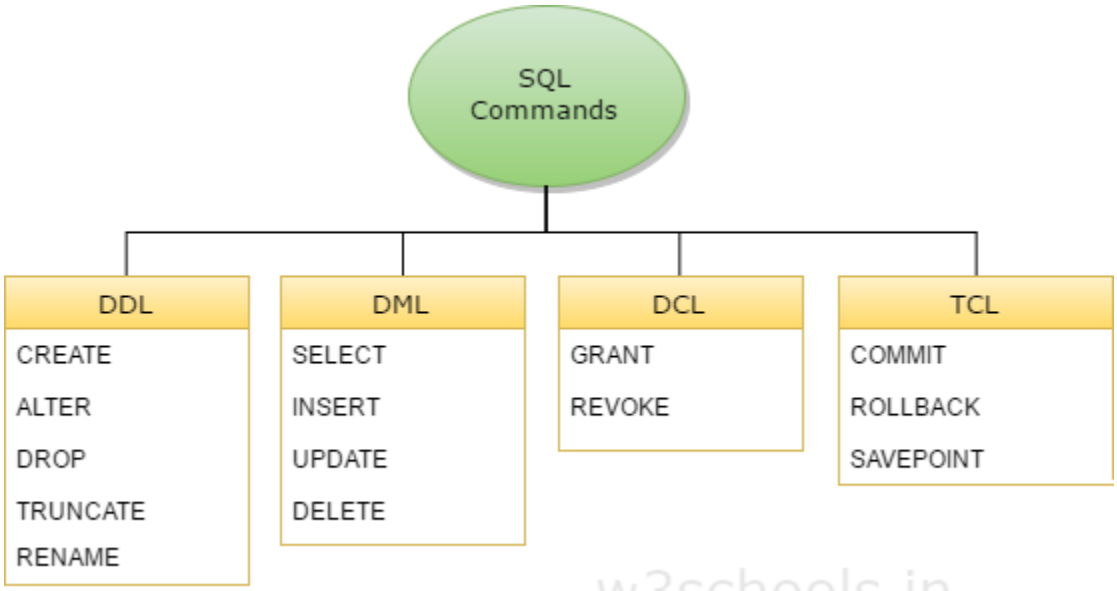
Record-Notes

PRACTISINGDDL&DMLCOMMANDS

DataDefinitionLanguage

The data definition language is used to create an object, alter the structure of an object and also dropalready created object. The Data Definition Languages used for table definition can be classified intofollowing:

- Createtablecommand
- Altertablecommand
- Truncatetablecommand
- Droptablecommand



WEEK-3

1. **CREATIONOFTABLES:**

SQL-CREATETABLE:
Tableisaprimaryobjectofdatabase,usedtostoredatainformofrowsandcolumns.Itiscreatedusing

following command:

Syntax:CREATETABLEtablename(column_namedata_typeconstraints,…)

SQL>CREATETABLESAILORS((SIDint(10)PRIMARYKEY,SNAMEVARCHAR(
10),RATINGint(10),AGEint(10));

Table

Created.Descc

ommand

TheDESCRIBEcommandisusedtoviewthestructureofatableasfollows.SQL>DESC

SAILORS;

TESTRESULT

Example1:CreateanRESERVEStablewithfields(SID,BID

,DAY)anddisplayusingDESCRIBEcommand.

Example2:CreateaBOATStablewithFields(BID,BNAME,COLOR)anddisplayusingDESCRIBEcomma
nd

2. ALTERTABLE:

ToADDacolumn:

SYNTAX: ALTER TABLE <TABLE NAME>ADD (<NEW
COLUMNNAME><DATATYPE>(<SIZE>),<NEWCOLUMNNAME><
DATATYPE>(<SIZE>).....);

EX:(WriteyourownQuery)

TESTOUTPUT

ToDROPacolumn:

SYNTAX:ALTERTABLE<TABLENAME>DROPCOLUMN<COLUMNNAME>;.

EX:(WriteyourownQuery)

TESTOUTPUT

ToMODIFYacolumn:

SYNTAX:ALTERTABLE<TABLENAME>MODIFY(<COLUMNNAME>
<NEWDATATYPE>(<NEWSIZE>));

EX:(WriteyourownQuery)

TESTOUTPUT

Example1:

SQL>ALTERTABLESAILORADD(SNONUMBER(10));

TESTOUTPUT

3. **RENAMEATABLE**

Renamecommandisusedtogivenewnamesforexistingtables.

SQL>**RENAME**oldtablename

TOnewtablename;EX:(Writeyourown Query)

TESTOUTPUT

4. **TRUNCATEATABLE**

Truncatecommandisusedtodeleteallrecordsfromatable.

SQL>TRUNCATETABLEtablename;EX:(

WriteyourownQuery)

TESTOUTPUT

5. **DROPATABLE**

Dropcommandisusedtoremoveanexistingtablepermanentlyfromdatabase.

SQL>

DROPTABLEtablename;EX:(Wri

teyourownQuery)

TESTOUTPUT

VIVAQUESTIONS

1. Definedataand information.
2. DefineDatabasemanagementsystem.
3. WhatisSQL?
4. Whatisthesyntaxforcreatingatable?
5. ListthecomponentsofSQL.
6. DefineDDL?WhataretheDDLcommands?
7. Listouttheusesofaltercommand.
8. WhatisSyntaxfortruncateatable?
9. Whatistheusedroptablecommand?

WeeklyEvaluation

0:NotDone | 1:Incomplete | 2:Latecomplete

3:Needsimprovement | 4:Complete | 5:WellDone

Signatureoftheinstructor | Date: \ \

Record-Notes

WEEK-4

DMLCOMMANDS

1. ToRetrieve/DisplayDatafromTables:

a. SelectcommandisusedtoselectvaluesordatafromtableSYNTAX

SELECT*FROMTABLENAME;

Example:

SQL>SELECT*FROMSAILORS;TE

STOUTPUT:

b. **Theretrievingofspecificcolumnsfromatable**

SQL>**SELECT**columnname1,columnname2,….columnnamenFROMtablename;EX:(Writeyourown Query)

TESTOUTPUT

c. **Eliminationofduplicatesfromtheselectstatement**

SQL>**SELECTDISTINCT**columnname1,columnname2,….columnnamenFROMtablename;

EX:(WriteyourownQuery)

TESTOUTPUT

d. **Selectingadatasetfromtabledata**

SQL>**SELECT**columnname1,columnname2,….columnnamenFROMtablenameWHEREsearc
hcondition;

EX:(WriteyourownQuery)

TESTOUTPUT

Example1:DisplayDataFromRESERVESTable

Example2:DisplayDataFromBOATSTable

2. INSERTINGDATAINTOTABLE

Insertcommandisusedtoinsertrowsintothetable.SYNT

AX:
INSERTINTOtablename(columnname1,columnname2,….columnnamen)

Example:

SQL>INSERTINTOSAILORSVALUES(22,'DUSTIN',7,45.0);
1rowcreated
SQL>INSERTINTOSAILORSVALUES(29,'BRUTUS',1,33.0);
1rowcreated

INSERTIONofDatacanalsobedonebythefollowingSyntax:

SYNTAX

INSERTINTOtablename(columnname1,columnname2,….columnnamen)VALUES(Value1,Value2,..V
aluen);

Example:
SQL>INSERTINTOSAILORS(SID,SNAME,RATING,AGE)VALUES(31,'LUBBER
',8,55.5);
1rowcreated

Example1:INSERTdataintoRESERVEStable:T

ESTOUTPUT:

Example2:INSERTdataintoBOATStable:TE

STOUTPUT:

UPDATE

ThisSQLcommandisusedtomodifythevaluesinanexistingtable.

SQL>**UPDATE**tablename

SETcolumn1=expression1,column2=expression2,...

WHEREsomecolumn=somevalue;

An expression consists of either a constant (new value), an arithmetic or stringoperation oranSQL query. Note that the new valueto assign to <column>mustmatchingdatatype.

An update statement used without a where clause results in changing respectiveattributesofalltuplesin thespecifiedtable.

Example1:UPDATESAILORSS
SETS.age=S.age+1,S.rating=S.rating-
1WhereS.sid=34546;
TESTOUTPUT

Example2:(WriteyourownQuery)

TESTOUTPUT

DELETE

Inordertodeleterowsfroma

tableweusethiscommandSQL>**DELETE**

FROMtablenameWHEREcondition;

Basedontheconditionspecifiedtherows getsfetchedfromthetableandgetsdeletedintable.HeretheWHEREclauseisoptional.

Example1:DELETES.AGEFROMSAILORSSwhereS.Sname=’Smith’;

TESTOUTPUT

Example2:DELETEFROMSAILORS;TE

STOUTPUT

VIVAQUESTIONS

1. WhataretheDMLcommands?
2. Howthedataorvaluestobeenteredintoatable?
3. WhatistheuseofDELETEcommand?
4. Howthedataorvaluestobeupdatedonatable?
5. ListouttheusesofSELECTcommand?
6. Howthedata orvaluesareretrievedfromatable?
7. DefineDML?WhataretheDML commands?

WeeklyEvaluation

0:NotDone		1:Incomplete		2:Late complete	
3:Needsimprovement		4:Complete		5:WellDone	

Signatureoftheinstructor Date: \ \

Record-Notes

WEEK-5

KEYCONSTRAINTS

Domain Integrity
constraintsEntity Integrity
constraintsReferentialIntegrityc
onstraints

1. PRIMARY KEY&NOTNULL

Example:

```
CREATETABLEsailors(sidinteger,
                   sname varchar(32)
                   ,rating integer NOT
                   NULL,agereal,
                   PRIMARYKEY(sid));
```

Tablecreated.

TestOutput:

Example:PracticewithyourownQuery:

TestOutput

ImposingICusingALTER

Example:AlterTableSailorsMODIFYsname varchar(32)NOTNULL;

TestOutput

Example:PracticewithyourownQuery:

TestOutput

2. **DEFAULT**

```
CREATETABLEsailors(sidinteger,
                   sname varchar(32)
                   ,rating integer NOT
                   NULL,age real DEFAULT
                   25,PRIMARYKEY(sid));
```

Example:PracticewithyourownQuery:

TestOutput

3. UNIQUE

```
CREATETABLEsailors(sidinteger,
                        sname varchar(32) UNIQUE
                        ,ratinginteger,
                         age real DEFAULT
                         25,PRIMARY
                         KEY(sid));
```

TestOutput

Example:PracticewithyourownQuery:

TestOutput

4. FOREIGNKEY

```
CREATE TABLE reserves ( sid integer not null, bid integer not null, day datetime not null, PRIMARY
KEY(sid,bid,day),FOREIGN KEY(sid)REFERENCESsailors(sid));
```

Example:PracticewithyourownQuery:

TestOutput

AddingForeignKeytoanexistingTable

```
AltertablereservesADDForeignKey(sidREFERENCESSailors(sid));
```

Example:PracticewithyourownQuery:

TestOutput

VIVAQUESTIONS

1) DifferencebetweenUNIQUEandPRIMARY KEY

2) WhendoyouuseCompositePrimarykey?
3) DifferencebetweenCandidateKey&PrimaryKey
4) WhatisthePrerequisiteforakeytobeusedasaForeignKey
5) WhatisaReferentialIntegrity?
6) GiveTwopracticalexamplesforReferentialIntegrity?

WeeklyEvaluation

0:NotDone ☐ 1:Incomplete ☐ 2:Late complete ☐

3:Needsimprovement ☐ 4:Complete ☐ 5:WellDone ☐

Record-Notes

WEEK-6

I) AGGREGATEFUNCTIONS&NUMERICFUNCTIONS

1. COUNT:

SYNTAX:

Selectcount([<distinct>/<ALL]<expr>)I

NPUTSQL>

Count number of different sailor

names?SelectCOUNT(distincts.sname)froms

ailorsTESTRESULT:

2. SUM:

SYNTAX:

SelectSUM([<distinct>/<ALL]<n>)IN

PUTSQL>

Findthesumofagesofallsailors?Sel

ect Sum(S.age)from sailors

S;TESTRESULT:

3. AVG:

SYNTAX:

SelectAVG([<distinct>/<ALL]<n>)IN

PUTSQL>

Findaverageofratingofallsailors?

Selectavg(S.rating)fromsailorsS;T

ESTRESULT:

4. MINIMUM(MIN):

SYNTAX:

SelectMIN([<distinct>/<ALL]<expr>)IN

PUTSQL>

Findyoungestsailorfromsailors?S

elect min(S.age)from sailors

S;TESTRESULT:

5. MAXIMUM(MAX):

SYNTAX:

SelectMAX([<distinct>/<ALL]<expr>)INP

UTSQL>

Findsidoftheoldestsailors?Se

lect max(s.sid)from

sailorTEST RESULT:

II) NUMERICFUNCTIONS

Selectabs(-9);

1) SYNTAX:
   Ceil()Ex:Selectceil
   (9.5);testoutput

2) SYNTAX:Floor()Ex:
Selectfloor(10.5);test
output

3) SYNTAXmod()
Ex:selectmod(17,5);t
estoutput

4) SYNTAX:power(n,m)
Ex: select
power(2,2);testoutput

5) SYNTAX:round(n,m)
Ex:selectround(10.586,2);t
estoutput

6) SYNTAX :
truncate(n,m)Ex:selecttrunc
ate(1.223,1);testoutput

7) SYNTAX :
sign()Ex:selectsig
n(-5);testoutput

8) SYNTAX :
sqrt()Ex:selectsqrt
(25);testoutput

III) <u>COMPARISONOPERATORS:</u>B

ETWEEN&AND
Example:

SQL>select*fromemp_master

wheresalaryBETWEEN5000AND8000;TestOutput:

INOperator:

SQL>Select*fromemp_masterwheredeptnoIN(10,30);Te

stOutput:

LIKEOperator:

SQL>select*Fromemp_masterwherejoblike‘M%’;TestOut

put:

Logicaloperator:
SQL>select*Fromemp_masterwherejoblike„_lerk‟;
TestOutput:

:
ANDOperator:
SQL>select*fromemp_masterwheresalary>5000andcomm<750;TestOut
put:

OROperator:

SQL>select*fromemp_masterwheresalary>5000orcomm<750;

TestOutput:

:

NOTOperator:

SQL>select*fromemp_masterwherenotsalary=10000;Test
Output:

IV) SINGLEROWFUNCTIONS(SCALARFUNCTIONS):Stri

ngFunctions:

1) Initcap(InitialCapital): ThisStringfunctionisusedtocapitalizefirstcharacterofthe

inputstring.

Syntax:initcap(string)

Example:

SQL>selectinitcap('azure')fromdual;T

estOutput

2) Lower: ThisStringfunction willconvertinputstringintolowercase.

Syntax: Lower(string)

Example:

SQL>selectlower(‘AZURE’)fromdual;T

estOutput:

3) Upper: Thisstringfunctionwillconvertinput stringintouppercase.

Syntax: Upper(string)**Exa**

mple:

SQL>selectupper(‘azure’)fromdual;

TestOutput:

4) Ltrim(LeftTrim):

Syntax: Ltrim(string,set)

Example:

SQL>selectltrim(‘azuretech’,’azure’)fromdual;T
estOutput:

5) Rtrim(RightTrim):

Syntax: Rtrim(string,set)

Example:

SQL>selectrtrim(‘azuretrim’,’trim’)fromdual;Tes

tOutput:

6) Translate:

Syntax: Translate(string1,string2,string3)

Example:

SQL>selecttranslate('abcde','xaybzcxdye','tanzmulrye')fromdual;Test

Output:

7) Replace:

Syntax: Replace(string,searchstring,replacestring)

Example:

SQL>selectreplace('jackandjue','j','bl')fromdual;TestO
utput:

8) Substr:

Syntax: Substr(string,starts[,count])

Example:

SQL>selectsubstr

('azuretechnology',4,6)fromdual;TestOutput:

9) Char:

Syntax: Char(number)

TestOutput:

Example:

SQL>selectchar(65)fromdual;T

estOutput:

10) Lpad(LeftPad):

Syntax: Lpad(String,length,pattern)

Example:

Sql>selectlpad('Welcome',15,'*') fromdual;

TestOutput

11) Rpad(RightPad):
Syntax: Lpad(String,length,pattern)

Example:

SQL>select
rpad('Welcome',15,'*')fromdual;TestOutput:

12) Length:Syntax:Le

ngth(string)Example:

SQL>selectlength('azure')fromdual;Tes

tOutput:

13) Concatenation(||)Operator:

Syntax: Concat(string1,string2)

SQL>select concat('Azure','Technology')from

dual;TestOutput.

:SQL>select'enameis'||enamefromemp_master;TestO
utput:

VIVAQUESTIONS

1) WhatarethedifferentAggregateFunction?
2) Canwe useMultipleAggregateFunctionsinaSingleQuery?
3) CanweuseAggregateFunctionsinMathematicalCalculations?
4) NameanyFiveStringFunctionsandexplaintheiroperations?
5) Whatdothe% &UnderscoresymbolsrepresentinaLIKEOperator.

WeeklyEvaluation

0:NotDone ☐ 1:Incomplete ☐ 2:Late complete ☐

3:Needsimprovement ☐ 4:Complete ☐ 5:WellDone ☐

Signatureof theinstructor ☐ Date ☐ \ \

Record-Notes

WEEK-7

NESTEDQUERIES&CORRELATEDQUERIES

NESTEDQUERIES

NestedQueryisa querythathasanotherqueryembeddedwithinit.

I) IN- is an operatorwhich allows us to checkwhether avalue is present in agiven setofelements

Example1:FindtheNamesofSailorswhohavereservedboatsno:103

```
SelectS.name
        FromSailorsS
        WhereS.sidIN(selectR.sid
                        from reserves
                        RwhereR.bid=103)
                        ;
```

TestOutput

Example:PracticewithyourownQueryusingNOTIN:

TestOutput

Example2:FindthenamesofSailorswhohavereservedaredboatusinga nestedquery.

```
SelectS.name
        FromSailorsS
        WhereS.sidIN(selectR.sid
                        fromreservesR
```

whereR.bidIN(selectR.bid

fromBoatsB
whereB.color=’red’))

TestOutput

Example3:PracticewithyourownQuery:

TestOutput

CORRELATEDQUERIES

I) EXISTS:

TheEXISTSoperatorisanothersetcomparisonoperatorsuchasIN.Itallowsustotestwhetherthesetisn on emptyand willretrievetheData.

Example1:FindthenamesofSailorswhohavereservedboatno.103Select

```
S.name
        FromSailors
        WhereEXISTS(Select*
                                fromReservesR
                                whereR.bid=103ANDR.sid=S.sid);
```

TestOutput

Example2:FindthesailorswhoseratingisbetterthansomeSailorcalled‘Horatio’Select

```
S.sid
        FromSailorsS
        WhereS.rating>ANY(selectS2.rating
                                        FromSailors.S2
                                        WhereS2.name=’Horatio’);
```

TestOutput

Example3:PracticewithyourownQuery:

TestOutput

GROUPBYandHAVINGClauseSYNT

AX

Select[DISTINCT]selectlistFROMfromlistWHEREqualificationGro
upbyGroupinglist havinggroup-qualification

Example1:select S.rating MIN(S.age)From Sailors SGroupby

S.rating;TestOutput

Example2:Selectsum(E.sal)FromEmployeeGroupbyE.dept;TestOutp

ut

HAVINGCLAUSE

Example1:FindtheAverageageofallSailorsforeachratinglevelthathasatleasttwoSailorsSELECTAVG(S.a

ge)

FROM Sailors
SGROUP By
S.ratingHAVINGCount(
*)>1;

TestOutput

Example2:Findtheageoftheyoungestsailorwhoiseligibletovote.

TestOutput

OrderByClause
Select<column(s)>from<TableName>where[condition(s)][orderby<columnname>[asc/]desc
];

Example:

SQL>selectempno,ename,salaryfromemp_masterorderbysalary;Test

Output:

VivaQuestions

1) ExplaintheflowofexecutionforaNestedquery

2) DifferentiatebetweenflowofexecutioninNestedQueryandCorrelatedQuery?
3) Whathappens if we eliminate HAVINGclause in aquerywhichis having bothGROUP BYandHAVINGclauses.
4) WhatarethedifferenttypesofNestedQueries?
5) WhatarethedifferenttypesofCorrelatedQueries?

WeeklyEvaluation

0:NotDone		1:Incomplete		2:Late complete	
3:Needsimprovement		4:Complete		5:WellDone	

Signatureoftheinstructor Date: \ \

Record-Notes

WEEK-8

VIEWS

After a table is created and populated with data, it may become necessary to prevent all usersfrom accessing all columns of a table, for data security reasons. This would mean creatingseveral tables having the appropriate number of columns and assigning specific users to eachtable as required. This will achieve the security requirements but will rise to a great deal ofredundant databeing resident in tables, in the database. To reduce redundant data to theminimumpossible,oracleallowsthecreationofanobject calledaview.

A viewis a virtual table or logical representation of another table or combination oftables. A view consists of rows and columns just like a table. The difference between a viewand a table is that views are definitions built on top of other tables (or views), and do not holddata themselves. If data is changing in the underlying table, the same change is reflected in theview. A view can be built on top of a single table or multiple tables. It can also be built on topof another view. A view derives its data from the tables on which it is based. These tables arecalled base tables. Base tables might in turn be actual tables or might be views themselves. Alloperations performed on a view actually affect the base table of the view. We can use views inalmost the same way as tables. Also can query, update, insert into and delete from views,justasin standardtables.

Views are essentially saved SELECT queries that can themselves be queried. They areusedtoprovideeasieraccesstonormalizeddata.Forexample,theOrderstablehasinformationabou t an order. Although it references the employee and customer involved in each order, theOrders doesn't itself contain any valuable information about the employee and customer. Wehave seen how to use joins to output valuable data from different tables. Creating a view is awayofsavingthesetypesofmorecomplicatedqueries.Viewsofferthefollowingadvantages:

1. Ease of use: A view hides the complexity of the database tables from end users. Essentiallywecanthinkofviewsasalayerofabstractionontopofthedatabasetables.

2. Spacesavings:Viewstakesverylittlespacetostore,sincetheydonotstoreactualdata.

3. Additional data security: Views can include only certain columns in the table so that onlythenon-sensitivecolumnsareincludedandexposedtotheenduser.Inaddition,somedatabases allow views to have different security settings, thus hiding sensitive data from pryingeyes.

AIM:ImplementViews:

Syntax: CreateView<View_Name>AsSelectstatement;

Example:
SQL>CreateViewEmpViewAs Select*fromEmployee;
Viewcreated.

Syntax: Selectcolumnname,columnnamefrom<View_Name>;
Example:

SQL>SelectEmpno,Ename,SalaryfromEmpViewwhere
Deptnoin(10,30);TestOutput:

UPDATABLEVIEWS:
SyntaxforcreatinganUpdatable View:

CreateViewEmp_vwAs
Select Empno,Ename,Deptno from Employee;

Viewcreated.

SQL>Insert into Emp_vw

values(1126,'Brijesh',20);SQL>Update Emp_vw set

Deptno=30 where Empno=1125;1rowupdated.

SQL>DeletefromEmp_vwwhereEmpno=1122;T

estOutput:

SQL>Update EmpDept_Vw set salary=4300 where

Empno=1125;TestOutput:

SQL>Delete From EmpDept_Vw where
Empno=1123;TestOutput

DESTROYINGAVIEW:
Syntax: DropView<View_Name>;
Example:
SQL>DropViewEmp_Vw;

TestOutput:

VIVAQUESTIONS

1. Defineview.
2. Whatistheneedof aview?
3. Listouttheadvantagesofviews.
4. Whatisthesyntaxforcreatingaview?
5. Howcanyouinsertdataintoaview?
6. Howcanyouupdatedataintofromaview?
7. Whatisthesyntaxfordeletingaview?
8. Listoutthecriteriaforupdatableviews.
9. Whatisthesyntaxforrenamingthecolumnsofaview?
10. Listreasonsforimplementingviews.

WeeklyEvaluation

0:NotDone ☐ 1:Incomplete ☐ 2:Late complete ☐

3:Needsimprovement ☐ 4:Complete ☐ 5:WellDone ☐

Signatureoftheinstructor ☐ Date: ☐

Record-Notes

WEEK-9

JOINS

SQLjoinsareusedtoquerydata
fromtwoormoretables,basedonarelationshipbetweencertain columnsinthesetables.

ORDERTABLE

OrderID	CustomerID	OrderDate
10308	2	1996-09-18
10309	37	1996-09-19
10310	77	1996-09-20

CUSTOMERTABLE

CustomerID	CustomerName	ContactName	Country
1	AlfredsFutterkiste	Maria Anders	Germany
2	AnaTrujilloEmparedados	AnaTrujillo	Mexico
3	AntonioMorenoTaquería	AntonioMoreno	Mexico

INNERJOIN

TheINNERJOINkeywordreturnrowswhenthereisatleast
onematchin bothtables.

1) SELECTOrders.OrderID,Customers.CustomerName,Orders.OrderDate

FROMOrdersINNERJOINCustomersONOrders.CustomerID=Customers.CustomerID;

TestOutput

2) SELECTCustomers.CustomerName,Orders.OrderID
FROMCustomersINNERJOINOrdersONCustomers.CustomerID=Orders.CustomerIDORDERBY

Customers.CustomerName;

TESTOUTPUT

LEFTJOIN

TheLEFTJOIN keywordreturnsallrowsfromtheleft
table(table_name1),evenifthereareno matchesintherighttable(table_name2).SELECTCustome

rs.CustomerName,Orders.OrderIDFROMCustomers

LEFTJOINOrdersONCustomers.CustomerID=Orders.CustomerIDORD

ERBYCustomers.CustomerName;

TESTOUTPUT

RIGHT JOIN

TheRIGHTJOINkeywordReturnallrowsfromtheright
table(table_name2),evenifthereareno matchesinthelefttable(table_name1).This is

another table named employee.here they have to give field

accordingly.SELECTOrders.OrderID,Employees.FirstName

FROMOrders

RIGHTJOINEmployees

ONOrders.EmployeeID=Employees.EmployeeIDORD

ERBYOrders.OrderID;

TESTOUTPUT

OUTERJOIN

SELECTCustomers.CustomerName,Orders.OrderIDF
ROMCustomers
FULLOUTERJOINOrders
ONCustomers.CustomerID=Orders.CustomerIDORD
ER BYCustomers.CustomerName;

TESTOUTPUT

UNION

Syntax

Selectattributefromtable_nameunionselectattributefromtable_name;Exampl

e: Select name from sailors union select bname from

boats;**TESTOUTPUT**

Example 2:SELECTCity FROM Customers

UNIONSELECT City FROM Suppliers ORDER BY

City;**TESTOUTPUT**

UNIONALL

Selectrsidfromreserveunionallselectsidfromsailors;

TESTOUTPUT

VivaQuestions

1) WhatisJoin?
2) WhatisthedifferencebetweenInnerJoin&OuterJoin.
3) Whatarethepreprequisitesforanytwotablestoapplyajoin?
4) Giveanytwopracticalexampleswhereweusejoins?
5) DifferentiatebetweenUNIONandUNIONALL

WeeklyEvaluation

0:NotDone		1:Incomplete		2:Late complete	
3:Needsimprovement		4:Complete		5:WellDone	

Signatureoftheinstructor Date: \ \

Record-Notes

WEEK-10

TRIGGERS

In MySQL, a trigger is a set of SQL statements that is invoked automatically when a change ismadetothedataontheassociatedtable.Atriggercanbedefinedtobeinvokedeitherbeforeorafterthedatai schangedbyINSERT, UPDATEorDELETEstatement.

- BEFOREINSERT –activatedbeforedataisinsertedintothetable.
- AFTERINSERT – activatedafterdataisinsertedintothetable.
- BEFOREUPDATE –activatedbeforedatainthetableisupdated.
- AFTERUPDAT –activatedafterdatainthetableisupdated.
- BEFOREDELETE –activatedbeforedataisremovedfromthetable.
- AFTERDELETE –activatedafterdataisremovedfromthetable.

A database trigger is procedural code that is automatically executed in response to certainevents on a particular table orview in a database. The trigger is mostly used for maintainingtheintegrity oftheinformationon thedatabase.

Theeventsthatfireatriggerincludethefollowing:
1)DMLstatementsthatmodifydatainatable(INSERT,UPDATE,orDELETE)2)DDLstateme nts.
3) Systemeventssuchasstartup,shutdown,anderrormessages.
4) Usereventssuchaslogonandlogoff.Note:OracleFormscandefine,store,andruntriggersofadiffe rentsort.

ToViewlistoftriggers;

Showtriggers;

ToremoveatriggerforDatabase

droptriggertrigger_name;ex:

droptriggerins_sal;

TypesofTriggers:-

1. **Row Triggers** :-A row trigger is fired each time the table is affected by the triggeringstatement. For example, if an UPDATE statement updates multiple rows of a table, a rowtrigger is fired once for each row affected by the UPDATE statement. If a triggering statementaffectsnorows,arowtriggerisnotexecutedatall.

Rowtriggersareusefulifthecodeinthetriggeractiondependsondata providedbythetriggering statement or rows that are affected. For example, Figure 15 - 3 illustrates a rowtriggerthatusesthevaluesofeachrowaffectedbythetriggeringstatement.

2. **Statement Triggers** :A statement trigger is fired once on behalf of the triggering statement,regardless of the number of rows in the table that the triggering statement affects (even if norows are affected). For example, if a DELETE statement deletes several rows from a table, astatement-level DELETE trigger is fired only once, regardless of how many rows are deletedfromthetable.

Statement triggers are useful if the code in the trigger action does not depend on thedata provided by the triggering statement or the rows affected. For example, if a trigger makesa complex security check on the current time or user, or if a trigger generates a single auditrecordbasedonthetypeoftriggeringstatement,astatementtriggerisused.

When defining a trigger, specify the trigger timing. That is, specify whether the triggeraction is to be executed before or after the triggering statement. BEFORE and AFTER apply tobothstatementandrowtriggers

Sample:

```
CREATETRIGGERtrigger_name       trigger_time
                                trigger_eventONtable_name
 FOREACHROW
 BEGIN
 ...END
 ;

trigger_time=before/aftertrigger_event=insert/delete/
 update
```

Example:

```
CREATE TRIGGER sal_sum after insert ON
    empFOREACHROWSET@sal=@sal+NEW.sal;
```

Firingatrigger:

Question:Findthesumofsalariesofallemployees1)Firs

tcreateatable**emp**withfollowingcolumns

Field	**Type**
empid	int(11)
ename	varchar(50)
sal	int(11)

WriteaQuery:

TESTOUTPUT

2) createvariable/parameter**sal**asbelowatmysqlpromptmysql

>**set@sal=0;**

3) nowcreatetriggeronemp

CREATE TRIGGER sal_sum after insert ON
empFOREACHROWSET@sal=@sal+NEW.sal;
TESTOUTPUT

4) insertthevaluesintotableemp;
mysql> insert into emp
values(1001,'suhaas',10000);mysql> insert into emp
values(1002,'Dilraj',15000);mysql>insertintoempvalues(1
003,'Riyanshi',25000);

Note:triggerisfiredonafterinsert5)
checkvaluesinthetableemp;

mysql>select*fromemp;
TESTOUTPUT

6) checkingvalueintheparametersalm

ysql>select@salasTotalSalary;
TESTOUTPUT

Note:whenevertherеisinsertoperationthatvalueinthe**sal**variableincreases

VIVAQUESTIONS

1. Definedatabasetriggers.
2. Listouttheusesofdatabasetriggers.
3. Whataretheparsoftriggersand ituses?
4. Listoutthetypesoftrigger.
5. Whatistheuseofrowtrigger?
6. Whatistheuseofstatementtrigger?
7. Whatdoyoumeantbytriggertime?
8. Comparebeforetriggerandaftertrigger.
9. WhatisthesyntaxforDROPatrigger?
10. Listoutthesomesituationstoapplybeforeandaftertriggers.

WeeklyEvaluation

0:NotDone | 1:Incomplete | 2:Late complete

3:Needsimprovement | 4:Complete | 5:WellDone

Signatureof theinstructor | Date: \ \

Record-Notes

WEEK-11

PROCEDURES

TCL (TRANSACTION CONTROL): Transaction control statements are used to manage thechanges made by DML statements. It allows statements to be grouped together into logicaltransactions.TCLCommandsareCommit,RollbackandSavepoint.

COMMIT -Savestheworkdone

SAVEPOINT- Identify apoint in atransaction to which youcanlaterrollback

ROLLBACK-RestoredatabasetooriginalsincethelastCOMMIT

Procedure

By default, mysql recognizes the semicolon as a statement delimiter, so you must redefine thedelimiter temporarily to cause mysql to pass the entire stored program definition to the server.Toredefinethemysqldelimiter,usethedelimitercommand.

syntax

```
delimiter//
createprocedureprocedurename(inparameter)begi
n
select*fromtablename;en
d //
```

Example:

```
createtablenamedempwithtwo  fieldsnameandsalary;
```

WriteaQuery

TESTOUTPUT

delimiter//

```
 createprocedureemp(inname_pvarchar(20))begi
n
select*fromempwherename=name_p;end
//
callsailor("smith");
```

withinoutparameter:

```
delimiter//
createprocedurecounterset(inoutcountin(4),inincint(4))begin
setcount=count+inc;e
nd //

set@counter=1;

callcounterset(@counter,4);sel

ect@counter;
```

TESTOUTPUT

Transaction(commit&rollback)

```
createtableaccount(namevarchar(20),salint);

insertintoaccountvalues('mani',2000);i
nsert into account
values('raju',3000);select*fromaccount
;
```

TESTOUTPUT

```
setautocommit=0;
//
starttransaction;
//
updateaccountsetsal=30000wherename='mani';
//
select*fromaccount;
```

TESTOUTPUT

```
rollback;
select*fromaccount;
//
updateaccountsetsal=5000wherename='raju';
//
select*fromaccount;
```

commit;
changesarenowmadepermanentro
llback;
select*fromaccount;
/sameoutputwillget/

TESTOUTPUT

Note:whenautocommit=1thethedatabase commitseverysingleupdateandrollbackisnotpossible.

VIVAQUESTIONS

1. Whatisaprocedure?
2. Whatisafunction?
3. Differentiateproceduresandfunctions.
4. Whatisthesyntaxfordefiningaprocedure?
5. Listouttheparametersandkeywordswhichareusedinprocedures.
6. Whataretheadvantagesofprocedure?
7. Whatisthesyntaxfordefiningafunction?
8. Listtheadvantagesoffunctions.
9. Whatarethepartsofproceduresand functions?
10. Listouttheparametersandkeywordswhichareusedinfunctions
11. WhatareTCLcommandsanditsuses?
12. ListouttheusesofvariousTCLcommands?

WeeklyEvaluation

0:NotDone ☐ 1:Incomplete ☐ 2:Late complete ☐

3:Needsimprovement ☐ 4:Complete ☐ 5:WellDone ☐

Signatureoftheinstructor ☐ Date: ☐ \ ☐ \ ☐

Record-Notes

WEEK-12

PL/SQL

PL/SQLprogramsarewrittenaslinesoftextusingaspecificsetofcharacters:

- Upper-andlower-caselettersA..Zanda..z
- Numerals0..9
- Symbols()+-*/<>=!~^;:. '@%, "#$&_|{}?[]
- Tabs,spaces,andcarriagereturns

PL/SQL keywords arenotcase-sensitive,so lower-caseletters areequivalent tocorrespondingupper-caselettersexceptwithinstringandcharacterliterals.

AlineofPL/SQLtextcontainsgroupsofcharactersknownaslexicalunits:

- Delimiters(simpleandcompoundsymbols)
- Identifiers,whichincludereservedwords
- Literals
- Comments

To improve readability, you can separate lexical units by spaces. In fact, you must separateadjacentidentifiersbyaspaceorpunctuation.Thefollowinglineisnotallowedbecausethereserve dwordsENDandIFarejoined:

IFx>yTHENhigh:=x;ENDIF;--notallowed,mustbeENDIF

You cannot embed spaces inside lexical units except for string literals and comments. Forexample,thefollowinglineisnotallowedbecausethecompoundsymbolforassignment(:=)issplit:

count:=count+1;--notallowed,mustbe:=

Toshowstructure,youcansplitlinesusingcarriagereturns,andindentlinesusingspacesortabs.Thisf ormattingmakesthefirstIF statementmorereadable.

IFx>yTHENmax:=x;ELSEmax:=y;ENDIF;

1) WRITEA PROGRAM TOPRINTHELLO
WORLDBEGIN
DBMS_OUTPUT.PUT_LINE('HELLOWORLD');EN
D;

TESTOUTPUT

2) WRITEAPROGRAMTOPRINTEVENNUMBERSFROM1TO100DECLA
RE
NNUMBER(3):=0;
BEGIN
WHILE
N<=100LOOP
N
:=N+2;DBMS_OUTPUT.PUT_LINE
(N);ENDLOOP;
END;

TESTOUTPUT

3) WRITEAPROGRAMTOACCEPTANUMBERANDFINDSUMOFTHEDIGITSDECLAR
E
NNUMBER(5):=&N;S
NUMBER:=0;
RNUMBER(2):=0;BEGIN
WHILE N
!=0LOOPR:=MOD
(N,10);S:=S+R;
Page 1 of
7N:=TRUNC(N/10
);ENDLOOP;
DBMS_OUTPUT.PUT_LINE('SUM OF DIGITSOFGIVENNUMBERIS'||S);END;

TESTOUTPUT

4) Writeaprogramtoacceptanumberandprintitinreverseorder
```
DECLA
RE
N
NUMBER(5):=&N;RE
VNUMBER(5):=0;R
NUMBER(5):=0;BEGI
N
WHILE N
!=0LOOPR:=MO
D(N,10);REV:=RE
V*10+R;N:=TRUN
C(N/10);ENDLOO
P;
DBMS_OUTPUT.PUT_LINE('THEREVERSEOFAGIVENNUMBERIS'||REV);END;
```

TESTOUTPUT

5) WriteaprogramacceptthevalueofA,B&Cdisplay
```
whichisgreaterDECLARE
ANUMBER(4,2):=&A;
B
NUMBER(4,2):=&B;C
NUMBER(4,2):=&C;B
EGIN
IF(A>BANDA>C)THENDBMS_OUTPUT.PUT_LINE('
AISGREATER'||''||A);ELSIFB>CTHEN
DBMS_OUTPUT.PUT_LINE('BISGREATE'||''||B);EL
SE
DBMS_OUTPUT.PUT_LINE('CISGREATER'||''||C);END
IF;
END;
```

VIVAQUESTIONS

1) WhatisPL/SQL?
2) WhatisthebasicstructureofPL/SQL?
3) HowisaprocessofPL/SQLcompiled?
4) MentionwhatPL/SQLpackageconsistsof?
5) WhatarethebenefitsofPL/SQLpackages?
6) WhatisthedifferencebetweenFUNCTION,PROCEDUREANDPACKAGEinPL/SQL ?

WeeklyEvaluation

0:NotDone ☐ 1:Incomplete ☐ 2:Latecomplete ☐

3:Needsimprovement ☐ 4:Complete ☐ 5:WellDone ☐

Signatureoftheinstructor ☐ Date: ☐ \ \

Record-Notes

WEEK-13

DCL (DATA CONTROL LANGUAGE): Data Control Language statements are used tocreate roles, permissions, and referential integrity as wellit is used tocontrol accesstodatabasebysecuringit.DCLCommandsareGrantandRevoke

GRANT -givesuser'saccessprivilegestodatabase

REVOKE -

withdrawaccessprivilegesgivenwiththeGR

ANTcommand

CheckingofUserPrivileges,Grantsetcm

ysql>createusermrcet_cse;
QueryOK,0rowsaffected(0.30sec)
*ToCheckwhereisthecreateduseri.elocationinourdatabase
mysql>selectuser();
TESTOUTPUT

***Tocheckwhatarethegrantsthatthelocationishaving/mysq
l>**showgrants**;**

TESTOUTPUT

***ToCheckwhataretheGRANTShavingforcreatedusermys
ql>**showgrantsformrcet_cse;

TESTOUTPUT

mysql>showtables;

TESTOUTPUT

***ToFlush(RE-FRESH)theprivilegesmysql>**flushprivile
ges;
QueryOK,0rowsaffected(0.08sec)

Explanation:Tocheckwhereistheuseri.eincaseifwecreateduser(Ex:mrcet_cse)itwillbedisplayed as"%". Rootuserisbydefaultsoit will beavailablein"Localhost"*

mysql>selecthost,userfrommysql.user;
TESTOUTPUT

VIVAQUESTIONS

1. WhatareDCLcommands?
2. ListouttheusesofvariousDCLcommands?
3. WhatarethedifferenttypesofCommands inSQL.
4. Whatis thedifferencebetweenTCL &DCLcommands.
5. Whohastheprivilegetoaccess theDCLcommands.

WeeklyEvaluation

0:NotDone		1:Incomplete		2:Late complete	
3:Needsimprovement		4:Complete		5:WellDone	

Signatureoftheinstructor | | Date: \ \

Record-Notes

CASESTUDY1

Emp(eid:integer,ename:string,age:integer,salary:real)Works(

eid:integer,did:integer,pcttime:integer)

Dept(did:integer,dname:string,budget:real,managerid:integer)

1. Giveanexampleofaforeignkeyconstraintthatinvolvestheprelation.Whataretheoptions

forenforcingthisconstraintwhenauserattemptstodeleteaDepttuple?

2. Write theSQLstatementsrequired tocreate the above relations,including

appropriateversionsofallprimaryandforeignkeyintegrityconstraints.

3. DefinetheDeptrelationinSQLsothateverydepartmentisguaranteedtohaveamanage

r.

4. WriteanSQLstatementtoadd`JohnDoe'asanemployeewitheid=101,age=32and

salary=15;000.

5. WriteanSQLstatementtogiveeveryemployeea10%raise.

6. WriteanSQLstatementtodeletethe`Toy'department.Giventhereferentialintegrityconstraint

s you chose for this schema, explain what happens when this statement isexecuted.

WORKSHEET

WeeklyEvaluation

0:NotDone [ ] 1:Incomplete [ ] 2:Late complete [ ]

3:Needsimprovement [ ] 4:Complete [ ] 5:WellDone [ ]

Signatureoftheinstructor [ ] Date: [\ \ ]

CASESTUDY2

Suppliers(sid:integer,sname:string,address:string)Pa

rts(pid: integer, pname: string, color:

string)Catalog(sid: integer, pid: integer, cost:

real)Relational AlgebraandCalculus117

The key fields are underlined, and the domain of each field is listed after the field name.Thussidisthekeyfor Suppliers,pidisthekeyfor Parts,andsidandpidtogetherformthekey for Catalog. The Catalog relation lists the prices charged for parts by Suppliers. Writethefollowingqueriesinrelationalalgebra,tuplerelationalcalculus,anddomainrelationalc alculus:

1. Findthenamesofsupplierswhosupplysomeredpart.
2. Findthesidsofsupplierswhosupplysomeredorgreenpart.
3. Findthenumberofpartswhosenamehas5letters.
4. Findthesidsofsupplierswhosupplyatleast3parts.
5. Findthesidsofsupplierswhosupplyeverypart.

6. Findthesidsofsuppliers whosupplyeveryredpart.

7. Findthesidsofsuppliers whosupplyeveryredorgreenpart.

8. Findthesidsofsuppliers whosupplyeveryredpartorsupplyeverygreenpart.

9. Findpairsofsidssuchthatthesupplierwiththefirstsid

chargesmoreforsomepartthanthesupplierwiththesecondsid.

10. Findthepidsofpartsthataresuppliedbyatleasttwodifferentsuppliers.

11. Findthesidofsupplierwhosupplycostliestpart.

12. Findthepidsofpartssuppliedbyeverysupplieratlessthan$200.(Ifanysupplier eitherdoesnotsuppl

ythepartorchargesmorethan$200forit,thepartisnotselected.)

WORKSHEET

WeeklyEvaluation

0:NotDone		1:Incomplete		2:Late complete	
3:Needsimprovement		4:Complete		5:WellDone	

Signatureoftheinstructor Date: \ \

CASESTUDY3

Considerthefollowingrelationscontainingairlineflightinformation:Flig

hts(flno:integer,from:string,to:string,

distance:integer,departs:time,arrives:time)

Aircraft(aid:integer,aname:string,cruisingrange:integer)Certified(eid:int

eger,aid:integer)

Employees(eid:integer,ename:string,salary:integer)

Note that the Employees relation describes pilots and other kinds of employees as well; everypilot is certified for some aircraft (otherwise, he or she would not qualify as a pilot), and onlypilotsarecertified tofly.

Write thefollowingqueriesin relational algebra, tuple relationalcalculus, anddomainrelational

calculus.

1. Findtheeidsofpilotscertifiedforsome Boeing aircraft.
2. Findthenamesofpilotscertifiedforsome Boeingaircraft.
3. Findtheaidsofallaircraftthatcanbeusedonnon-stopflightsfromBonntoMadras.
4. Identifytheflightsthatcanbepilotedbyeverypilotwhosesalaryismorethan$100,000.

(Hint:Thepilotmustbecertifiedforatleastoneplanewithasufficientlylargecruisingrange.)

5. Findthenamesofpilotswhocanoperatesomeplanewitharangegreaterthan3,000milesbutare notcertifiedonanyBoeingaircraft.

6. Findtheeidsofemployeeswhomakethehighestsalary.

7. Findtheeidsofemployeeswhomakethesecondhighestsalary.

8. Findtheeidsofpilotswhoarecertifiedforthelargestnumberofaircraft.

9. Findtheeidsofemployeeswhoarecertifiedforexactlythreeaircraft.

10. Findthetotalamountpaidtoemployeesassalaries.

11. Istherea sequenceofflightsfromMadisontoTimbuktu?Eachflight inthesequenceisrequiredtodepartfromthecitythatisthedestinationofthepreviousflight;thefirst flightmustleaveMadison,thelastflightmustreachTimbuktu,andthereis norestrictiononthenumberofintermediateflights.Yourquerymustdeterminewhetherasequence

WORKSHEET

WeeklyEvaluation

0:NotDone ☐ 1:Incomplete ☐ 2:Late complete ☐

3:Needsimprovement ☐ 4:Complete ☐ 5:WellDone ☐

Signatureoftheinstructor ☐ Date: ☐ \ ☐ \ ☐