

UNIT II

Oracle9i: Overview: Personal Databases—
Client/Server Databases—Oracle9i an introduction—
SQL*Plus Environment—SQL—Logging into SQL*Plus—
SQL*Plus Commands—Errors & Help—Alternate Text
Editors—SQL*Plus Worksheet – iSQL*Plus .Oracle Tables:
DDL: Naming Rules and conventions— Data Types—
Constraints—Creating Oracle Table—Displaying Table
Information—Altering an Existing Table—Dropping,
Renaming, Truncating Table—Table Types—Spooling—Error
codes.

Text Book: “DATABASE SYSTEMS USING ORACLE”-NILESH SHAH, 2nd
Edition, PHI

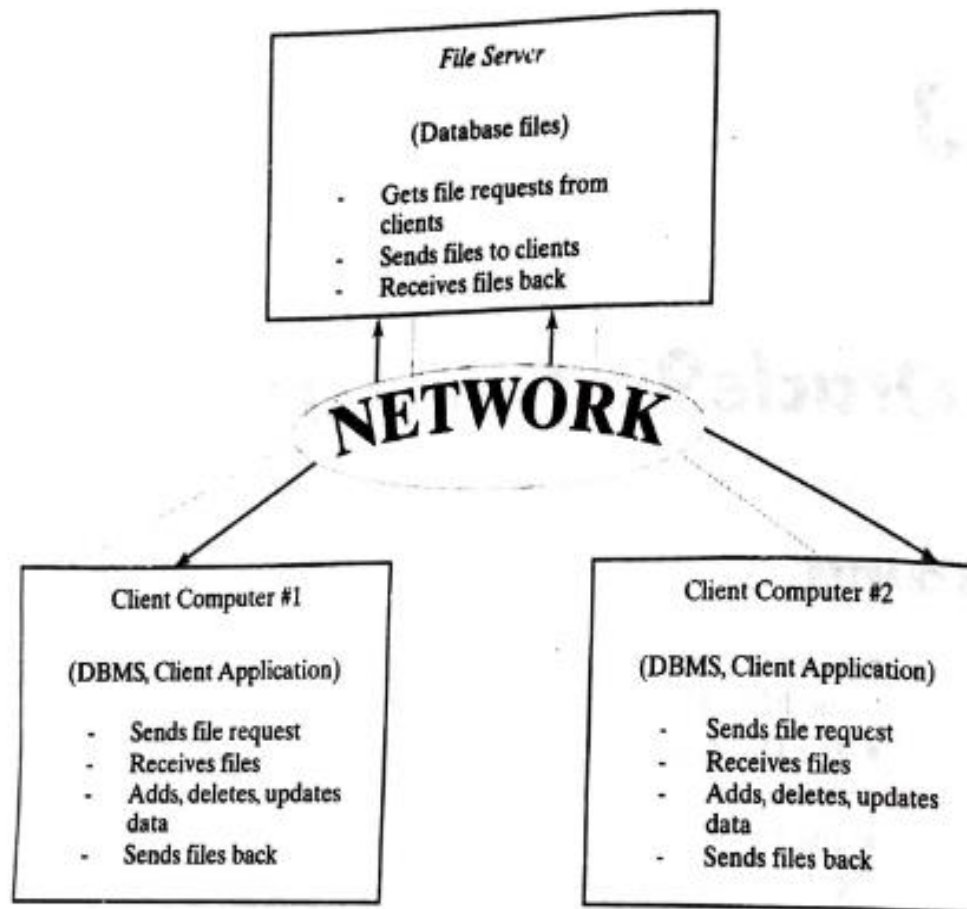
Prepared by Dr.P.Radha

Oracle9i: Overview

- Personal Databases
- Client/Server Databases
- Oracle9i an introduction
- SQL*Plus Environment
- SQL
- Logging into SQL*Plus
- SQL*Plus Commands
- Errors & Help
- Alternate Text Editors
- SQL*Plus Worksheet
- iSQL*Plus

Personal Databases

- Personal database management system such as Microsoft Access and visual Fox Pro, are usually stored on a user's desktop computer system or a client computer



- Demand on Client and Network
- Table Locking
- Client Failure
- Transaction Processing

Client Server Databases

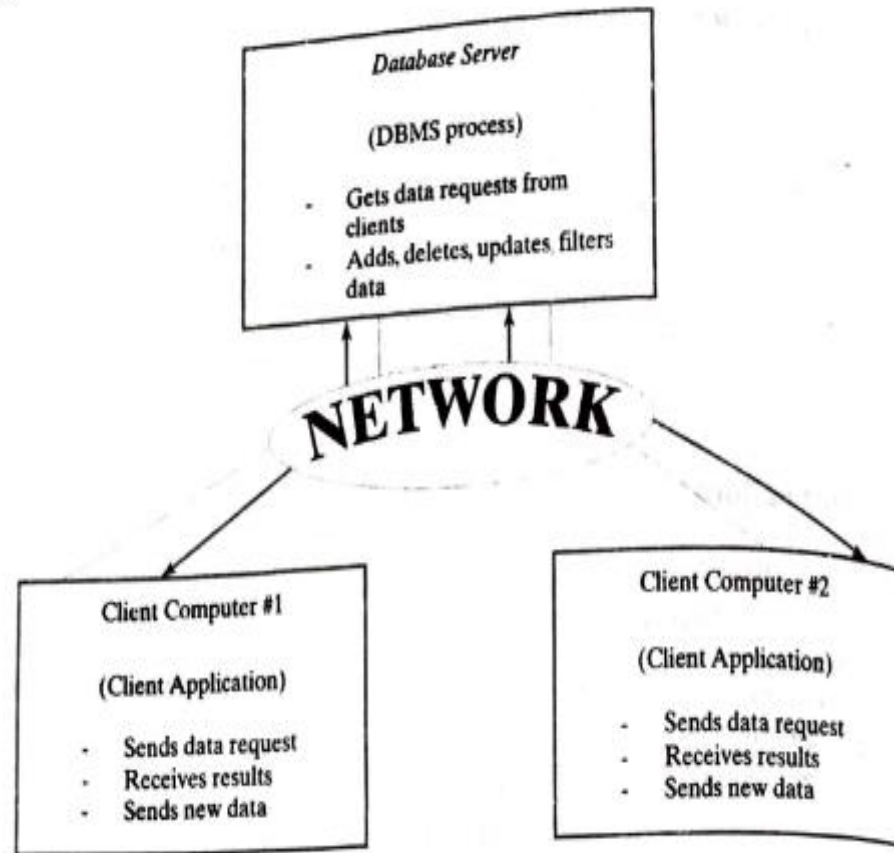


Figure 3-2 A client/server database system in a multiuser environment.

Oracle 9i: An Introduction

- SQL *Plus-SQL*Plus environment is for writing command-line. SQL queries to work with database objects such as tables, views, synonyms and sequences.
- PL/SQL –PL/SQL is oracle's extension to SQL for creating procedure code to manipulate data.

Developer Suite- This tool is used for developing database applications and includes

- J developer- a Java development tool
- Designer –to model business processes and generate Enterprise applications
- Forms Developer – a development tool for internet and client/server based environments
- Oracle Reports-a generation tool

- Enterprise Manager- A tool for managing users and databases.

Enterprise Managers use the following tools:

- Storage Manager-to create and manage “tablespaces”
- Instance Manager –to start,stop,or tune databases.
- Security Manager-to create and manage users,profiles and roles
- Warehouse Manager-to manage data warehousing applications
- XML Database Manager-to render traditional database data as XML for e-business support
- SQL Worksheet-to enter, edit, and execute SQL*Plus code or to run client side scripts
- iSQL*Plus-a Web-based environment to execute SQL*Plus code.

Oracle Application Server(Oracle9iAS)- A tool for creating a website that allows users to access Oracle databases through Webpages.

It Includes:

- Webserver

The SQL*PLUS Environment

- Accepts ad hoc entry of statements at the command line prompt(i.e,SQL>)
- Accepts SQL statements from files
- Provides a line editor for modifying SQL Queries.
- Provides environment, editor, format , execution, interactions, and file commands.
- Formats query results, and displays reports on the screen
- Controls environmental settings
- Accesses local and remote databases.

Structured Query Language(SQL)- SELECT

- Data retrieval – SELECT
- Data Manipulation Language(DML)- Insert ,Update and Delete
- Data Definition Language(DDL) – Create ,Alter, Drop, Rename and Truncate
- Transaction Control- COMMIT, SAVEPOINT and ROLLBACK
- Data Control Language(DCL)-Grant and Revoke

LOGGING IN TO SQL*PLUS

- In the Windows environment, In the windows environment, click Start – programs-Oracle—Application Development –SQL Plus. A Log on windows , Enter your Username, Password, and Host String as provided by your Database Administrator.
- In a command-line environment such as DOS, type `sqlplus [username [/password [@host/database]]]` to log in

Logging in to SQL *PLUS

The image shows a 'Log On' dialog box with the following fields and values:

Field Label	Value
User Name:	nshah
Password:	*****
Host String:	oracle

Buttons: OK, Cancel

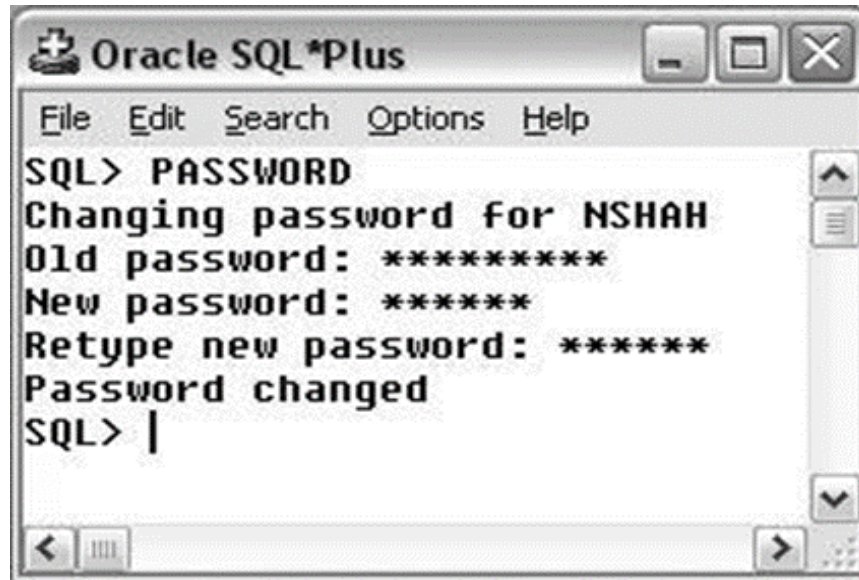
Figure 3-4 SQL*Plus Log On window.

SQL *Plus Commands

SQL	SQL*Plus
1.A nonprocedural language to communicate with the Oracle server.	An environment for executing SQL statements
2.ANSI standard	Oracle's proprietary environment.
3.Key words cannot be abbreviated	Key words can be abbreviated
4. Last statement is stored in the buffer.	Commands are not stored in the buffer.
5. Statements manipulate data and table structures in the database	Commands do not allow manipulation of data in the database
6. Uses a termination character to execute the command immediately	Commands do not need a termination character.

SQL queries versus SQL*Plus commands.

PASSWORD COMMAND



```
Oracle SQL*Plus
File Edit Search Options Help
SQL> PASSWORD
Changing password for NSHAH
Old password: *****
New password: *****
Retype new password: *****
Password changed
SQL> |
```


ORACLE ERRORS AND ONLINE HELP

- Some errors are easy to find; some are not.
- To fix an error, always start at the line where the error is shown, but keep in mind that the error might not be on that line.
- Check for common mistakes like misspelled keywords, missing commas, misplaced commas, missing parentheses, invalid user-defined names, or repeated user-defined identifiers

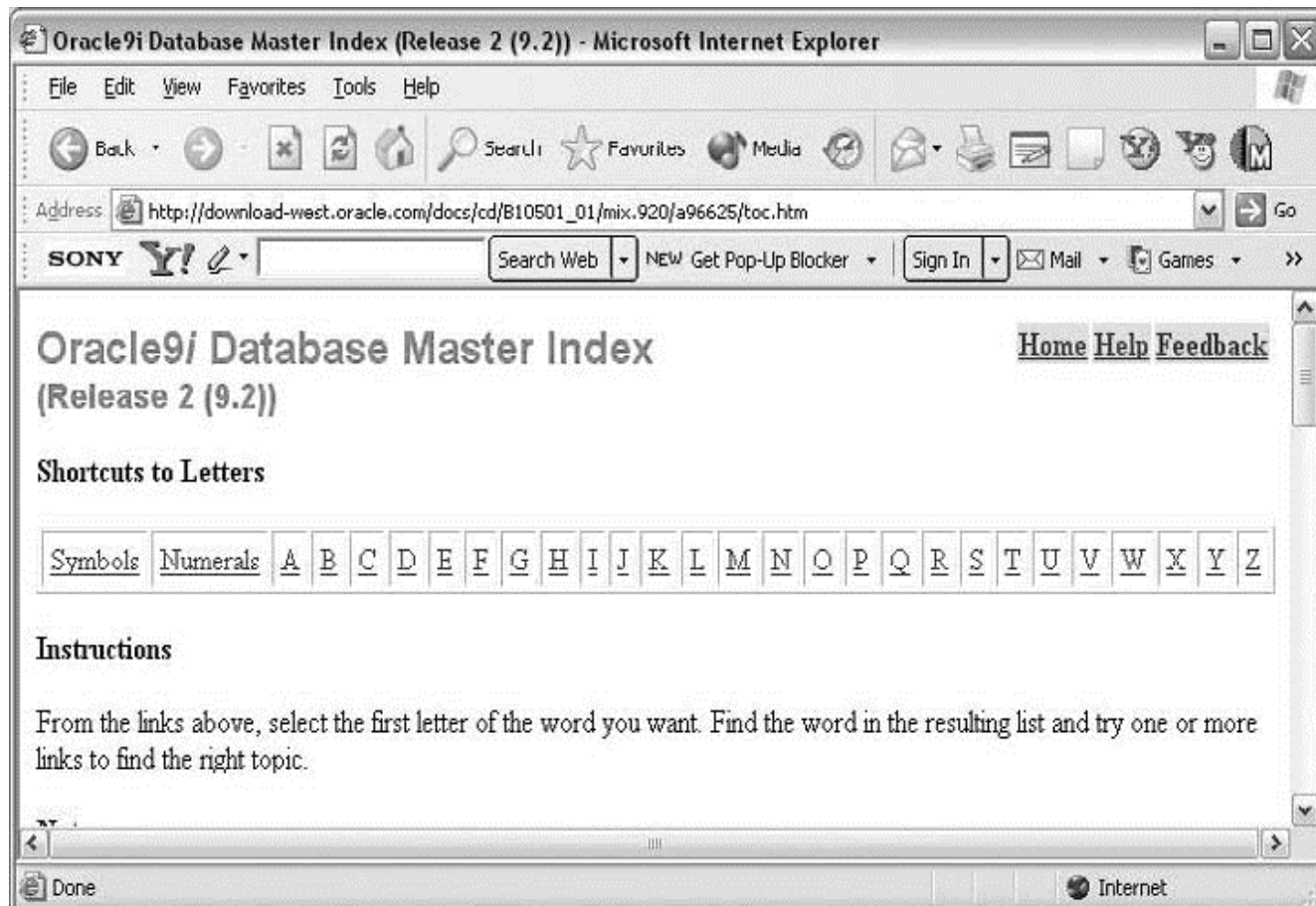
- Each Oracle product has its own specific help file.
- The help application opens up a window, similar to Microsoft Windows help, where you can click on the Index tab and type the error code (ORA-00XXX) of interest.
- Oracle provides the user with an explanation of the cause of the error and the user action required to rectify it.
- If you don't see the Oracle Help option in the programs menu, search for the ora.hlp file and open it.
- You can also access Oracle9i Release 2 online help at the following URL:

http://download-west.oracle.com/docs/cd/B10501_01/mix.920/a96625/toc.html

ALTERNATE TEXT EDITORS

- The SQL*Plus editor is a line editor similar to EDLIN in MS-DOS
- The user does not have control over the screen. Line editors do not allow a user to move the cursor up and down, and clicking with a mouse is definitely out of the question.

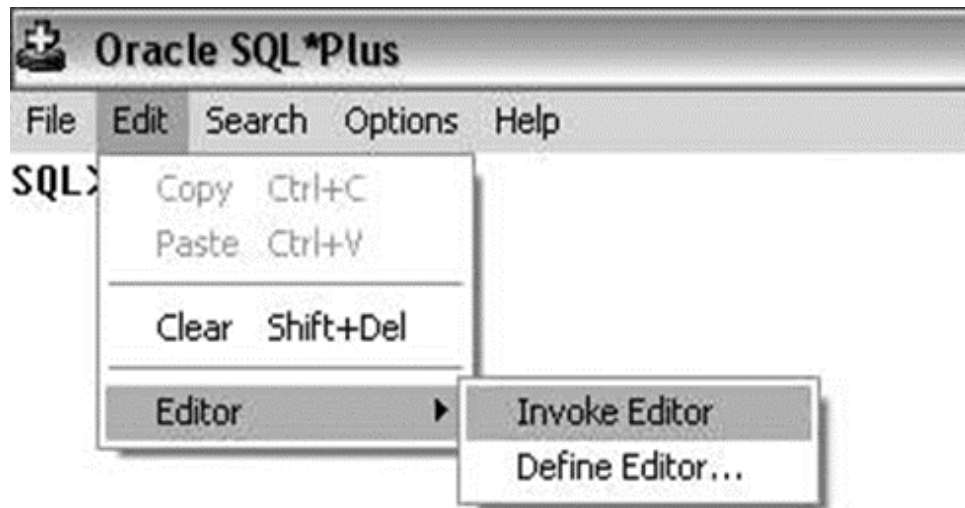
Oracle9i Online Documentation— Index Page



SQL *Plus Worksheet

- The query typed in a full-screen text editor has to be saved in a file with an .sql extension or copied to the clipboard.
- The query can be loaded from a file or pasted from the clipboard into SQL*Plus to execute it at the SQL > prompt.

Alternate Editor.



SQL *Plus Worksheet

- The SQL*Plus Worksheet is another environment available with Oracle's Enterprise Manager.
- The SQL*Plus Worksheet enables you to enter, edit, and execute SQL*Plus code. You can also run client-side scripts

SQL *Plus Worksheet

- You can execute SQL*Plus Worksheet by double-clicking on the SQL*Plus Worksheet icon in the Windows desktop or by selecting the following from the Windows START button:

START | [All] Programs | Oracle – OraHome92 |
Application Development | SQLPlus Worksheet

iSQL*Plus

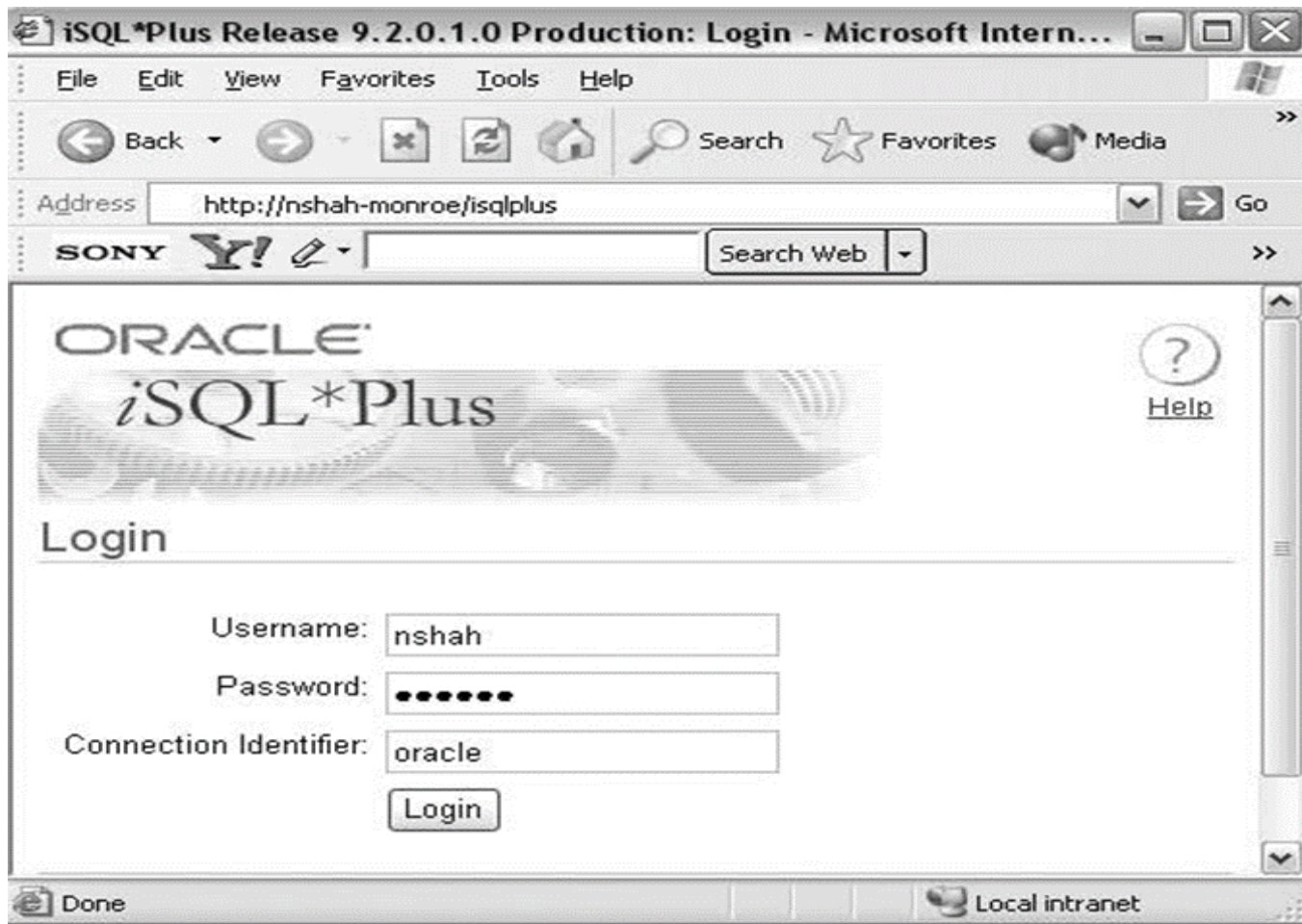
- The third environment is Web based and is called iSQL*Plus. To access it through a Web browser, enter a URL as follows:

`http://machinename.domainname:port/isqlplus`

- In this URL, machine name is your machine, but port number is not required in all versions.

`http://nshah-monroe/isqlplus`

iSQL*Plus Login Screen.



iSQL*Plus Work Screen With Query And Result.

ORACLE
iSQL*Plus

Logout New Session History Preferences Help

Work Screen

File or URL:

Enter statements:

```
SELECT * FROM course
WHERE Prereq IS NOT NULL;
```

COURSE	TITLE	CREDITS	PREREQ
LA123	English Literature	3	EN100
CIS265	Systems Analysis	3	CIS253

http://localhost:7778/isqlplus Local intranet

SAMPLE DATABASES

The Indo-US (IU) College Student Database

STUDENT (StudentId, Last, First, Street, City, State, Zip, StartTerm, BirthDate, FacultyId, MajorId, Phone)

StudentId	Last	First	Street	City	State	Zip	Start Term	Birth Date	FacultyId	MajorId	Phone
00100	Diaz	Jose	1 Ford Avenue #7	Hill	NJ	08863	WN03	02/12/83	123	100	9735551111
00101	Tyler	Mickey	12 Morris Avenue	Bronx	NY	10468	SP03	03/18/84	555	500	7185552222
00102	Patel	Rajesh	25 River Road #3	Edison	NJ	08837	WN03	12/12/85	111	400	7325553333
00103	Rickles	Deborah	100 Main Street	Iselin	NJ	08838	FL02	10/20/70	555	500	7325554444
00104	Lee	Brian	2845 First Lane	Hope	NY	11373	WN03	11/28/85	345	600	2125555555
00105	Khan	Amir	213 Broadway	Clifton	NJ	07222	WN03	07/07/84	222	200	2017585555

FACULTY (FacultyId, Name, RoomId, Phone, DeptId)

FacultyId	Name	RoomId	Phone	DeptId
111	Jones	11	525	1
222	Williams	20	533	2
123	Mobley	11	529	1
235	Vajpayee	12	577	2
345	Sen	12	579	3
444	Rivera	21	544	4
555	Chang	17	587	5
333	Collins	17	599	3

COURSE (CourseId, Title, Credits)

CourseId	Title	Credits	PreReq
EN100	Basic English	0	
LA123	English Literature	3	EN100
CIS253	Database Systems	3	
CIS265	Systems Analysis	3	CIS253
MA150	College Algebra	3	
AC101	Accounting	3	

Figure 3-19 Sample tables for the Indo-US (IU) College database.

CRSSECTION (Cslid, CourseId, Section, TermId, FacultyId, Day, StartTime, EndTime, RoomId, MaxCount)

Cslid	CourseId	Section	TermId	FacultyId	Day	StartTime	EndTime	RoomId	MaxCount
1101	CIS265	01	WN03	111	MW	09:00	10:30	13	30
1102	CIS253	01	WN03	123	TR	09:00	10:30	18	40
1103	MA150	02	WN03	444	F	09:00	12:00	15	25
1104	AC101	10	WN03	345	MW	10:30	12:00	16	35
1205	CIS265	01	SP03		MW	09:00	10:30	14	35
1206	CIS265	02	SP03	111	TR	09:00	10:30	18	30
1207	LA123	05	SP03		MW	09:00	10:30	15	30
1208	CIS253	21	SP03	123	TR	09:00	10:30	14	40
1209	CIS253	11	SP03	111	MW	09:00	10:30	18	40
1210	CIS253	31	SP03	123	F	TBA	TBA	19	2

TERM (TermId, TermDesc, StartDate, EndDate)

TermId	TermDesc	StartDate	EndDate
SP02	Spring 2002	04/28/2002	08/16/2002
FL02	Fall 2002	09/08/2002	12/20/2002
WN03	Winter 2003	01/05/2003	04/18/2003
SP03	Spring 2003	04/27/2003	08/15/2003
FL03	Fall 2003	09/07/2003	12/19/2003

ROOM (RoomType, RoomDesc)

RoomType	RoomDesc
L	Lab
C	Classroom
O	Office

REGISTRATION (StudentId, CsId, Midterm, Final, RegStatus)

StudentId	CsId	Midterm	Final	Status
00100	1103	C	F	R
00100	1102	B	B	R
00100	1104	B	A	R
00102	1102	F	D	R
00102	1103	A	A	R
00103	1101	F	W	W
00103	1104	D	D	R
00100	1207			X
00103	1206			W
00104	1206			X
00104	1207			R
00104	1210			R
00105	1208			R
00105	1209			X
00101	1205			X
00102	1210			R
00102	1207			X
00102	1206			R

DEPARTMENT (DeptId, DeptName, FacultyId)

DeptId	DeptName	FacultyId
1	Computer Science	111
2	Telecommunications	222
3	Accounting	333
4	Math & Science	444
5	Liberal Arts	555

MAJOR (MajorId, MajorDesc)

MajorId	MajorDesc
100	AAS-Accounting
200	AAS-Computer Science
300	AAS-Telecommunications
400	BS-Accounting
500	BS-Computer Science
600	BS-Telecommunications

LOCATION (RoomId, Building, RoomNo, Capacity, RoomType)

RoomId	Building	RoomNo	Capacity	RoomType
11	Gandhi	101	2	O
12	Gandhi	103	2	O
13	Kennedy	202	35	L
14	Kennedy	204	50	L
15	Nehru	301	50	C
16	Nehru	309	45	C
17	Gandhi	105	2	O
18	Kennedy	206	40	L
19	Kennedy	210	30	L
20	Gandhi	107	2	O
21	Gandhi	109	2	O

Oracle Tables : DDL

- Naming Rules and conventions
- Data Types
- Constraints
- Creating Oracle Table
- Displaying Table Information
- Altering an Existing Table
- Dropping, Renaming, Truncating Table
- Table Types
- Spooling
- Error codes

NAMING RULES AND CONVENTIONS

- A table is an object that can store data in an Oracle database
- When you create a table, you must specify the table name, the name of each column, the data type of each column, and the size of each column.

- The table and column names can be up to 30 characters long. It is possible to have a table name that is only one character long.
- In naming tables and columns, letters (A–Z, a–z), numbers (0–9) and special characters—\$ (dollar sign), _ (underscore), and # (pound or number sign)—are allowed.
- The table or column name, however, must begin with a letter.
- The names are not case sensitive, although Oracle stores all object names in uppercase in its data dictionary.
- Spaces and hyphens are not allowed in a table or a column name.

DATA TYPES

- When a table is created, each column in the table is assigned a data type.
- A data type specifies the type of data that will be stored in that column.
- By providing a data type for a column, the wrong kinds of data are prevented from being stored in the column.

Varchar2

- The VARCHAR2 type is a character data type to store variable-length alphanumeric data in a column. Currently, VARCHAR is synonymous with VARCHAR2, but it could be a separate data type with different semantics in the future
- The maximum allowable size is 4000 characters in Oracle9i.
- In Oracle9i, the VARCHAR2 data type can also take CHAR or BYTE parameters.

- For example, if a column NAME is assigned a data type VARCHAR2(25) and the name entered is Steve Jones, only 11 characters are stored

Char

- The CHAR type is a character data type to store fixed-length alphanumeric data in a column.
- The default and minimum size is one character. The maximum allowable size is 2000 characters
- The CHAR type is appropriate for fixed-length values

For example, PHONE, SOCIAL_SECURITY_NUMBER, or MIDDLE_INITIAL columns can use the CHAR type

The phone numbers and Social Security numbers have numeric values, but they also use special characters, such as hyphens and parentheses.

Both use fixed-length values, however, so CHAR is the most appropriate type for them.

The CHAR data type uses the storage more efficiently and processes data faster than the VARCHAR2 type.

- In Oracle9i, the CHAR data type can also take CHAR or BYTE parameters.
- For example, CHAR(10 BYTE) is same as CHAR(10) because byte is the default. If CHAR(10 CHAR) is used, each CHAR may take up 1 to 4 bytes.
- In this text, you will see the default semantic only.

Number

- The NUMBER data type is used to store negative, positive, integer, fixed-decimal, and floating-point numbers.
- The NUMBER data type is used for any column that is going to be employed in mathematical calculations—for example, SALARY, COMMISSION, or PRICE.
- When a number type is used for a column, its **precision** and **scale** can be specified.

- An integer is a whole number without any decimal part. To define a column with integer values, only the scale size is provided.
- For example, EmployeeId in the EMPLOYEE table has values of 111, 246, 123, 433, and so on.
- A **fixed-point** decimal number has a specific number of digits to the right of the decimal point
- A **floating-point** decimal number has a variable number of decimal places

Date

- The DATE data type is used for storing date and time values.
- The range of allowable dates is between January 1, 4712 B.C. and December 31, 9999 A.D.
- The day, month, century, hour, minute, and second are stored in the DATE-type column.
- There is no need to specify size for the DATE type.
- The default date format is DD- MON-YY, where DD indicates the day of the month, MON represents the month's first three letters (capitalized), and YY represents the last two digits of the year. These three values are separated by hyphens.

- NCHAR.
- CLOB
- BLOB
- NCLOB
- BFILE.
- RAW(size) or LONG_RAW.
- ROWID.

CONSTRAINTS

- Constraints enforce rules on tables. An Oracle table can be created with the column names, data types, and column sizes, which are sufficient just to populate them with actual data.
- Without constraints, however, no rules are enforced.
- The constraints help you to make your database one with integrity

Types of Constraints

There are two types of constraints:

1. Integrity constraints: define both the primary key and the foreign key with the table and primary key it references.
2. Value constraints: define if NULL values are disallowed, if UNIQUE values are required, and if only certain set of values are allowed in a column.

Naming a Constraint

- Oracle identifies constraints with an internal or user-created name
- For a user's account, each constraint name must be unique.
- A user cannot create constraints in two different tables with the same name.
- The general convention used for naming constraints is

<table name>_<column name>_<constraint type>

Defining a Constraint

- A constraint can be created at the same time the table is created, or it can be added to the table afterward. There are two levels where a constraint is defined

Column level

A column-level constraint references a single column and is defined along with the definition of the column. Any constraint can be de- fined at the column level except for a FOREIGN KEY and composite primary key constraints.

The general syntax is

*Column datatype [CONSTRAINT constraint_name]
constraint_type,*

Table Level

- A table-level constraint references one or more columns and is defined separately from the definitions of the columns.
- Normally, it is written after all columns are defined.
- All constraints can be defined at the table level except for the NOT NULL constraint.

The general syntax is:

***[CONSTRAINT constraint_name]
constraint_type(Column, . . .),***

PRIMARY KEY Constraint

- The PRIMARY KEY Constraint is also known as the entity integrity constraint.
- It creates a primary key for the table.
- A table can have only one primary key constraint.
- A column or combination of columns used as a primary key cannot have a null value, and it can only have unique values.

**DeptId NUMBER (2) CONSTRAINT
dept_deptid_pk PRIMARY KEY,**

The FOREIGN KEY Constraint

- The FOREIGN KEY constraint is also known as the referential integrity constraint.
- It uses a column or columns as a foreign key, and it establishes a relationship with the primary key of the same or another table.

```
CONSTRAINTstudent_facultyid_fk  
FOREIGN KEY(FacultyId) REFERENCES  
faculty(FacultyId),
```

The NOT NULL Constraint

- The NOT NULL constraint ensures that the column has a value and the value is not a null (unknown or blank) value.
- A space or a numeric zero is not a null value. There is no need to use the not null constraint for the primary key column, because it automatically gets the not null constraint.
- The foreign key is permitted to have null values, but a foreign key is sometimes given the not null constraint. This constraint cannot be entered at the table level.

**Name VARCHAR2(15) CONSTRAINT
faculty_name_nn NOT NULL,**

The UNIQUE Constraint

- The UNIQUE constraint requires that every value in a column or set of columns be unique.
- If it is applied to a single column, the column has unique values only.
- If it is applied to a set of columns, the group of columns has a unique value together.
- The unique constraint allows null values unless NOT NULL is also applied to the column

```
CONSTRAINT dept_dname_uk  
UNIQUE(DeptName),
```

The CHECK Constraint

- The CHECK constraint defines a condition that every row must satisfy.
- There can be more than one CHECK constraint on a column, and the CHECK constraint can be defined at the column as well as the table level. At the column level, the constraint is defined by

```
DeptId NUMBER (2) CONSTRAINT dept_deptid_cc  
CHECK((DeptId >= 10) and (DeptId <= 99)),
```


The NOT NULL CHECK Constraint

- A NOT NULL constraint can be declared as a CHECK constraint. Then, it can be defined at column or table level. For example,
- `Name VARCHAR2(15) CONSTRAINT
faculty_name_ck CHECK(Name IS NOT
NULL),`

The DEFAULT Value

- The DEFAULT value ensures that a particular column will always have a value when a new row is inserted.
- The default value gets overwritten if a user enters another value

State CHAR(2) DEFAULT 'NJ',

CREATING AN ORACLE TABLE

- A user creates an Oracle table in the SQL*Plus environment.
- A Data Definition Language (DDL) SQL statement, CREATE TABLE, is used for table creation. A table is created as soon as the CREATE statement is successfully executed by the Oracle server. The general syntax of CREATE TABLE statement is:

CREATE TABLE [schema.] tablename

(column1 datatype [CONSTRAINT constraint_name] constraint_type. . . , column2 datatype [CONSTRAINT constraint_name] constraint_type, [CONSTRAINT constraint_name] constraint_type (column, . . .), . . .);

STORAGE Clause in CREATE TABLE

- A CREATE TABLE statement may have an optional STORAGE clause.
- This clause is used to allocate initial disk space for the table at the time of creation with the INITIAL parameter and also to allocate additional space with the NEXT parameter in case the table runs out of allocated initial space.
- For example,

```
CREATE TABLE sample (Id NUMBER(3), Name  
VARCHAR2(25)) TABLESPACE CIS_DATA STORAGE  
(INITIAL 1M NEXT 100K) PCTFREE 20;
```

DISPLAYING TABLE INFORMATION

- When a user creates a table or many tables in his or her database, Oracle tracks them all using its own Data Dictionary.
- Oracle has SQL statements and SQL*Plus commands for the user to view that information from Oracle's Data Dictionary tables

Viewing a User's Table Names

- A user types an SQL statement to retrieve his or her table names.
- Often, you use it to review information, and often, you want to find out what has already been created and what is to be created.
- To find out all tables owned by you, type the following statement:

```
SELECT TABLE_NAME FROM USER_TABLES;
```

Viewing a Table's Structure

```
SQL> DESCRIBE student
Name                               Null?      Type
-----
STUDENTID                          NOT NULL   CHAR (5)
LAST                                NOT NULL   VARCHAR2 (15)
FIRST                                NOT NULL   VARCHAR2 (15)
STREET                                         VARCHAR2 (25)
CITY                                           VARCHAR2( 15)
STATE                                          CHAR (2)
ZIP                                            CHAR (5)
STARTTERM                                      CHAR (4)
BIRTHDATE                                      DATE
FACULTYID                                      NUMBER (3)
MAJORID                                        NUMBER (3)
PHONE                                          CHAR (10)
SQL>
```

DESCRIBE command and table structure.

Viewing Constraint Information

```
SQL> SELECT CONSTRAINT_NAME, CONSTRAINT_TYPE  
2      FROM USER_CONSTRAINTS  
3      WHERE TABLE_NAME = 'STUDENT';  
CONSTRAINT_NAME
```

```
-----  
STUDENT_FIRST_NNC  
STUDENT_STUDENTID_PK P  
STUDENT_FACULTYID_FK R  
STUDENT_MAJORID_FK   R  
STUDENT_STARTTERM_FK R  
STUDENT_LAST_NN C  
6 rows selected SQL>
```


Viewing Table space Information

- A table space consists of one or more physical data files.
- You can get information about all table spaces available to you by using Data Dictionary view `USER_TABLE- SPACES`.

For example,

- `DESCRIBE USER_TABLESPACES SELECT * FROM USER_TABLESPACES;`

COMMENT on Tables and Columns

When you create a table, you can add comments to the table and its columns

COMMENT ON TABLE student IS 'Table holds students for INDO-US College'

COMMENT ON COLUMN employee.Lname IS 'Employee's last name'

ALTERING AN EXISTING TABLE

- There are certain modifications that you can make to a table's structure. There are other modifications that you cannot make to an existing table's structure.
- Modifications allowed without any restrictions include:
- Adding a new column to the table.
- Deleting a foreign key constraint from a table.
- Deleting a primary key constraint from a table, which also removes any references to it from other tables in the database with CASCADE clause.
- Increasing the size of a column. For example, VARCHAR2(15) can be changed to VARCHAR2(20).
- Renaming columns (Oracle9i onward).
- Renaming constraints (Oracle9i onward).

Modifications allowed with restrictions include:

- Adding a foreign key constraint is allowed only if the current values are null or exist in the referenced table's primary key.
- Adding a primary key constraint is allowed if the current values are not null and are unique.
- Changing a column's data type and size is allowed only if there is no data in it (Oracle8i and earlier). In Oracle9i, column size may be decreased if existing data can be stored with the new column width.
- Adding a unique constraint is possible if the current data values are unique.
- Adding a check constraint is possible if the current data values comply with the new constraint.
- Adding a default value is possible if there is no data in the column.

Modifications not allowed include:

- Changing a column's name (Oracle8i and earlier).
- Changing a constraint's name (Oracle8i and earlier).
- Removing a column (Oracle8 and earlier).

Adding a New Column to an Existing Table

- The general syntax to add a column to an existing table is

```
ALTER TABLE tablename ADD columnname datatype;
```

ALTER TABLE—adding a column

```
SQL> ALTER TABLE student
```

```
2  ADD Social Security CHAR(9);
```

Table altered.

```
SQL>
```

Modifying an Existing Column

The general syntax to modify an existing column is

```
ALTER TABLE tablename
```

```
MODIFY columnname newdatatype;
```


ALTER TABLE—modifying a column

```
SQL> ALTER TABLE student
```

```
2  MODIFY Social Security VARCHAR2(11);
```

```
Table altered.
```

```
SQL>
```

Adding a Constraint

- To add a constraint using ALTER TABLE, the syntax for table level constraint is used.

The general syntax of ALTER TABLE is

ALTER TABLE table name

ADD [CONSTRAINT constraint_name]
constraint_type (column, ...),

For example,

```
ALTER TABLE employee
```

```
ADD CONSTRAINT employee_positionid_fk
```

```
FOREIGN KEY (PositionId)
```

```
REFERENCES position (PositionId);
```

Dropping a Column (Oracle8i Onward)

- When you drop a column, there must be at least one column left in the table. In other words, you can't remove the last remaining column from a table.
- It is not possible to recover a dropped column and its data. The general syntax is

ALTER TABLE tablename DROP COLUMN columnname;

- Oracle9i also allows a user to mark columns as unused by using

ALTER TABLE tablename SET UNUSED(columnname);

- You can remove all unused columns when system resources are in less demand.

The general syntax is

```
ALTER TABLE table name DROP UNUSED COLUMNS;
```

ALTER TABLE—Dropping unused columns

```
SQL> ALTER TABLE student
```

```
2 SET UNUSED(Social Security);
```

Table altered.

```
SQL> ALTER TABLE student
```

```
2 DROP UNUSED COLUMNS;
```

Table altered.

```
SQL>
```

Dropping a Constraint

- A dropped constraint is no longer enforced by Oracle, and it does not show up in the list of `USER_CONS-TRAINTS` or `USER_CONS_COLUMNS`

The general syntax is

ALTER TABLE table name

*DROP PRIMARY KEY|UNIQUE (columnname) / CONSTRAINT
constraint name [CASCADE];*

```
ALTER TABLE employee  
DROP CONSTRAINT employee_deptid_fk;
```

Enabling/Disabling Constraints

- A constraint verifies table data as they are added or updated. This verification slows down the process, so you may want to disable a constraint if you are going to add or update large volume of data
- The general syntax for enabling or disabling constraint is

ALTER TABLE tablename

ENABLE / DISABLE CONSTRAINT

constraintname;

Renaming a Column (Oracle9i Version 9.2 Onward)

Rename a column with the following statement:

```
ALTER TABLE tablename RENAME  
COLUMN oldname TO newname;
```

Modifying Storage of a Table

- Change storage attributes of a table, such as NEXT, PCTFREE, and so, with the following statement:

```
ALTER TABLE tablename STORAGE  
(NEXT nK);
```

DROPPING A TABLE

- When a table is not needed in the database, it can be dropped. Sometimes, the existing table structure has so many flaws it is advisable to drop it and recreate it. When a table is dropped, all data and the table structure are permanently deleted.

The general syntax is

DROP TABLE tablename [CASCADE CONSTRAINTS];

For example

DROP TABLE sample;

RENAMING A TABLE

- Rename a table provided you are the owner of the table.

The general syntax is

RENAME oldtablename TO newtablename;

For example,

RENAME dept TO department;

TRUNCATING A TABLE

Truncating a table is removing all records/rows from the table. The syntax is

TRUNCATE TABLE tablename;

For example,

TRUNCATE TABLE employee;

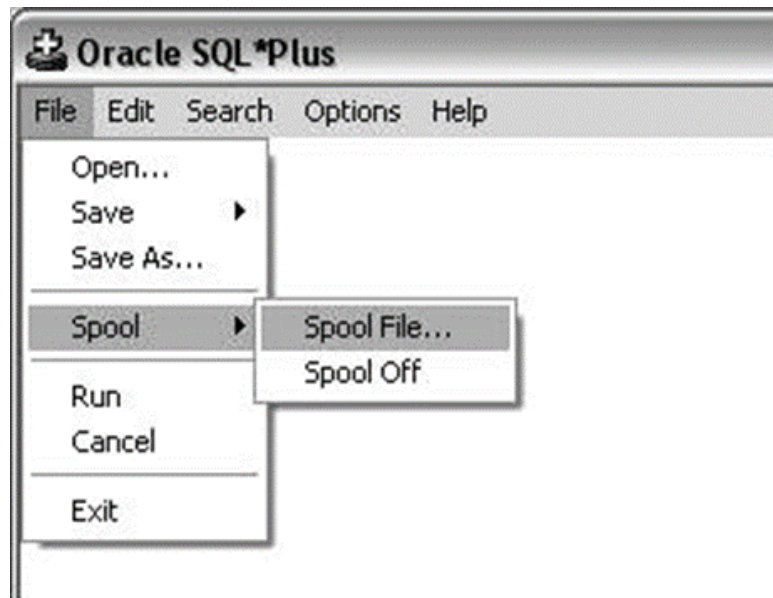
ORACLE'S VARIOUS TABLE TYPES

- Oracle9i uses various types of tables—permanent tables, temporary tables, index-organized tables, and external tables.
- Permanent tables are used for storing data.
- Temporary tables are used during a session or a transaction. Temporary tables are like permanent tables, but they are not stored permanently. They store data during a session or a transaction.
- Temporary tables are created with the `CREATE GLOBAL TEMPORARY TABLE` statement.
- Index-organized tables are used for tables with primary key values that are looked up frequently. Index-organized tables are created with a `CREATE TABLE tablename ORGANIZATION INDEX` statement.
- External tables are stored “outside” the database with `CREATE TABLE tablename ORGANIZATION EXTERNAL` statement.

SPOOLING

- Spooling is a very handy feature. During a session, a user can redirect all statements, queries, commands, and results to a file for later review or printout.
- The spooling method creates a text file of all actions and their results

Spool Menu.



Error Codes

- If Oracle Error Help is installed on your system, you will be able to get to it by clicking on START Oracle OraHome92.
- Once the error help screen is displayed, click on the Index tab.
- Then, type the error code received from Oracle in the space provided.