

## What you should have learned after this lecture ...

- ❑ some basic concepts of Oracle

## 2. Database Management: Handling Tables

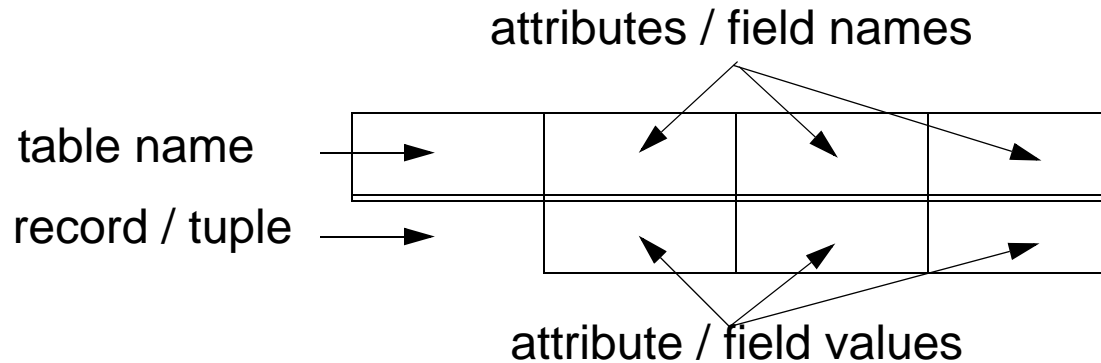
### Goals:

- ❑ rough view on databases as a collection of tables
- ❑ enable you to start with Oracle as soon as possible
  - creation of tables
  - insertion and modification of records (so-called **tuples**) in a table
  - show a few simple queries on a single table
- ❑ postpone the 'theoretical' discussion to a later time

### Concept of 'table' used in

- ❑ books, papers, newspapers, etc.
  - purpose: summarize information, give an overview
- ❑ spreadsheet programs
  - purpose: give an overview, make numerical computations (e.g., aggregations)
- ❑ databases
  - purpose: allow to retrieve (parts of the) data, make computations, derive new information (e.g., selections, combining information)

## What is a table?



## Example

Employee	EmpId	Name	Birthdate	Salary
	567	Meyer	03/25/1975	23000
	123	Smith	08/17/1959	41000
	456	Kirby	05/03/1966	37000

## How can we create this table (in Oracle)?

- ❑ use the DDL (data definition language to create the table)
- ❑ remember: the DDL is used to define the structure (i.e., the static part) of a database as part of the database's meta data information

- ❑ step 1: create the table header (table schema) by using the DDL

```
create table Employee
  (EmplId integer,
   Name varchar(25) not null,
   Birthdate date,
   Salary numeric(8,2),
   primary key (EmplId));
```

- ❑ step 2: create the table body (table instance) by using the DML

```
insert into Employee values(567, 'Meyer', 25-MAR-1975, 23000);
insert into Employee values(123, 'Smith', 17-AUG-1959, 41000);
insert into Employee values(456, 'Kirby', 03-MAY-1966, 35000);
```

### Error produced

- ❑ Kirby's salary is \$37000 and not \$35000
- ❑ correction by update command

```
update Employee set Salary = 37000 where EmplId = 456
```

## Some simple queries

- ❑ “Show the employee table.”

```
select * from Employee
```

Employee	Empld	Name	Birthdate	Salary
	567	Meyer	25-MAR-1975	23000
	123	Smith	17-AUG-1959	41000
	456	Kirby	03-MAY-1966	37000

- ❑ “Show the ids and salaries of all employees whose salary exceeds \$27000.”

```
select EmplId, Salary from Employee where Salary > 27000
```

	Empld	Salary
	123	41000
	456	37000

- ❑ Show only the employee ids and their salaries.

```
select EmplId, Salary from Employee
```

	EmplId	Salary
	567	23000
	123	41000
	456	37000

- ❑ How many employees are in the company.

```
select count (*) as total from Employee
```

	total
	3

# Introduction to Oracle and SQL

01 . 11 . 2011

Ganesh Viswanathan

TA, CIS4301

University of Florida, Gainesville

# Oracle Database @CISE

- First connect to a CISE server using
  - *Putty* from Windows
  - *Terminal* from Unix or Mac
- Available CISE linux servers for secure login (ssh):
  - [storm.cise.ufl.edu](http://storm.cise.ufl.edu)
  - [thunder.cise.ufl.edu](http://thunder.cise.ufl.edu)
- More info at:  
<http://www.cise.ufl.edu/help/access/remote/>

# Oracle Database @CISE

- Command line SQL\*Plus client:
  - From within a CISE secure shell connect to the Oracle Database instance *orcl* by running these two commands:  

```
% source /usr/local/etc/ora11.csh
```

```
% sqlplus <username>@orcl
```
- For a graphical client, download *Oracle SQL Developer* from (signup for Oracle store account for free to activate download, and have Java JDK installed):  
<http://www.oracle.com/technetwork/developer-tools/sql-developer/downloads/index.html>

# Oracle Database @CISE

- In *SQL Developer*, to add a connection:
- Right-click on the *Connections* tab in the left window panel, and choose **+New Connection**
- Enter the following parameters:
  - Hostname: **oracle.cise.ufl.edu**
  - Port: **1521**
  - SID: **orcl**
- Click *Save* and then *Connect*

# Oracle 11gR1

- The version of Oracle DBMS running on CISE servers is:

*Oracle Database11g Enterprise Edition Release 11.1.0.7.0*

- The official documentation for this version is available at:

<http://www.oracle.com/pls/db111/homepage>

- *Two useful items on this page are:*

*Supporting Documentation and the Search bar (top left)*

# *Structured Query Language (SQL)*

- Some of the DDL, DML and other statements available in Oracle SQL are listed here:

<http://oracle-tek.blogspot.com/2009/06/ddl-data-definition-language-ddl.html>

# *Structured Query Language (SQL)*

- We will now create, manipulate and query a sample **student** table using the SQL query language in Oracle DBMS.
- Try out the following commands in the SQL prompt (command line - SQL\*Plus) or in the SQL worksheet (GUI - SQL Developer)



# *SQL exercise*

- DDL:

```
create table student (  
    ufid      number(8)      primary key,  
    sname     varchar2(20)   not null,  
    major     varchar2(20),  
    address   varchar2(50),  
    gpa       number(3,2),  
    joindate  date );
```

# SQL exercise

DML:

```
insert into table student values (
```

```
    33330001, 'Tom', 'CSE', '1111 NW 6th Ave Gainesville FL 32601', NULL,  
    to_date('01/03/2011','mm/dd/yyyy') );
```

```
insert into table student values (
```

```
    22220001, 'Jane', 'DAS', '2222 NW 16th Ave Gainesville FL 32601', 3.97,  
    to_date('07/17/2010','mm/dd/yyyy') );
```

```
insert into table student values (
```

```
    11110001, 'Kristine', 'MIS', '33 SW 3rd St Micanopy FL 32667', 4.0,  
    to_date('01/05/2010','mm/dd/yyyy') );
```

```
insert into table student values (
```

```
    11110002, 'Bill', 'CSE', '4444 NW 26th Ave Gainesville FL 32601', 3.85,  
    to_date('01/15/2010','mm/dd/yyyy') );
```

```
insert into table student values (
```

```
    22220002, 'Glenn', 'CSE', '1111 NW 21st Ave Gainesville FL 32601', 3.95,  
    to_date('07/17/2010','mm/dd/yyyy') );
```

Note: String input should be enclosed in *single quotes*

# Table Information

- To view all the tables in your namespace using:  
`select table_name from user_tables;`
- To view the schema of the newly created table:  
`desc student;`
- To view the rows (tuples/ records) in the student table using:  
`select * from student;`  
`select rownum, id, name from student;`  
--notice the use of the pseudocolumn *rownum* to display row numbers  
/\* comments in SQL start with double dashes or can be enclosed like  
this \*/

# SQL exercise

```
alter table student add (comments varchar2(100));  
desc student;
```

```
insert into student (ufid,gpa,sname,comments)  
  values (44440001, 4.0, 'Indra', 'Honors student');
```

```
select * from student where sname like 'I%';
```

```
select * from student where (ufid >= 22220000 and sname < 'J');
```

```
delete from student where sname like 'Bill';
```

```
select count(*) from student;
```

# SQL exercise

```
savepoint student_sp1;
```

```
update student set major = 'CSE' where ufid = 44440001;
```

```
select * from student where ufid = 44440001;
```

```
rollback to student_sp1;
```

```
select * from student where ufid = 44440001;
```

Note: Do not include any DDL statements between a savepoint and its corresponding rollback. This is because DDL statements will **commit** (save the database state) automatically.

Use **quit** to leave SQL\*Plus.