



# UNIVERSITY OF CHITTAGONG

## Department of Computer Science and Engineering

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# Chapter 1

## Part 1

Test your knowledge:

1. The following SELECT statement executes successfully:

```
1 SELECT last_name, job_id, salary AS Sal FROM employees;
```

**Answer:** True

2. The following SELECT statement executes successfully:

```
1 SELECT * FROM job_grades;
```

**Answer:** True

3. There are four coding errors in the following statement. Can you identify them?

```
1 SELECT employee_id, last_name salx12 ANNUAL SALARY
2 FROM employees;
```

**Errors:**

- (a) Missing comma between `last_name` and `sal`.
- (b) `x` should be `*` for multiplication.
- (c) Alias `ANNUAL SALARY` needs to be quoted due to the space.
- (d) Missing `AS` keyword before the alias `ANNUAL SALARY`.

## Part 2

You have been hired as a SQL programmer for Acme Corporation. Your first task is to create some reports based on data from the Human Resources tables.

4. Your first task is to determine the structure of the DEPARTMENTS table and its contents.

DESCRIBE departments		
Name	Null	Type
-----		
DEPARTMENT_ID	NOT NULL	NUMBER(4)
DEPARTMENT_NAME	NOT NULL	VARCHAR2(30)
MANAGER_ID		NUMBER(6)
LOCATION_ID		NUMBER(4)
4 rows selected		

	DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
1	10	Administration	200	1700
2	20	Marketing	201	1800
3	30	Shipping	124	1500
4	60	IT	103	1400
5	80	Sales	149	2500
6	90	Executive	100	1700
7	110	Accounting	205	1700
8	190	Contracting	(null)	1700

**Answer:**

```
1 DESCRIBE HR.DEPARTMENTS;
2 SELECT * FROM HR.DEPARTMENTS;
```

5. You need to determine the structure of the EMPLOYEES table.

DESCRIBE employees		
Name	Null	Type
-----		
EMPLOYEE_ID	NOT NULL	NUMBER(6)
FIRST_NAME		VARCHAR2(20)
LAST_NAME	NOT NULL	VARCHAR2(25)
EMAIL	NOT NULL	VARCHAR2(25)
PHONE_NUMBER		VARCHAR2(20)
HIRE_DATE	NOT NULL	DATE
JOB_ID	NOT NULL	VARCHAR2(10)
SALARY		NUMBER(8,2)
COMMISSION_PCT		NUMBER(2,2)
MANAGER_ID		NUMBER(6)
DEPARTMENT_ID		NUMBER(4)
11 rows selected		

**Answer:**

```
1 DESCRIBE HR.EMPLOYEES;
```

6. The HR department wants a query to display the last name, job ID, hire date, and employee ID for each employee, with the employee ID appearing first. Provide an alias `STARTDATE` for the `HIRE_DATE` column. Save your SQL statement to a file named `lab_01_05.sql` so that you can dispatch this file to the HR department. Test your query in the `lab_01_05.sql` file to ensure that it runs correctly.

	EMPLOYEE_ID	LAST_NAME	JOB_ID	STARTDATE
1	100	King	AD_PRES	17-JUN-87
2	101	Kochhar	AD_VP	21-SEP-89
3	102	De Haan	AD_VP	13-JAN-83
4	103	Hunold	IT_PROG	03-JAN-90
5	104	Ernst	IT_PROG	21-MAY-91
6	107	Lorentz	IT_PROG	07-FEB-99
7	124	Mourgos	ST_MAN	16-NOV-98
8	141	Rajs	ST_CLERK	17-OCT-95
9	142	Davies	ST_CLERK	29-JAN-97
10	143	Matos	ST_CLERK	15-MAR-98
***				
19	205	Higgins	AC_MGR	07-JUN-94
20	206	Gietz	AC_ACCOUNT	07-JUN-94

**Answer:**

```
1 SELECT EMPLOYEE_ID, LAST_NAME, JOB_ID, HIRE_DATE AS STARTDATE
2 FROM EMPLOYEES;
```

7. The HR department wants a query to display all unique job IDs from the EMPLOYEES table.

	JOB_ID
1	AC_ACCOUNT
2	AC_MGR
3	AD_ASST
4	AD PRES
5	AD_VP
6	IT_PROG
7	MK_MAN
8	MK_REP
9	SA_MAN
10	SA_REP
11	ST_CLERK
12	ST_MAN

**Answer:**

```
1 SELECT DISTINCT JOB_ID
2 FROM HR.EMPLOYEES;
```

### Part 3

8. The HR department wants more descriptive column headings for its report on employees. Copy the statement from lab.01.05.sql to a new SQL Worksheet. Name the column headings Emp #, Employee, Job, and Hire Date, respectively. Then run your query again.

	Emp #	Employee	Job	Hire Date
1	100	King	AD_PRES	17-JUN-87
2	101	Kochhar	AD_VP	21-SEP-89
3	102	De Haan	AD_VP	13-JAN-93
4	103	Hunold	IT_PROG	03-JAN-90
5	104	Ernst	IT_PROG	21-MAY-91
6	107	Lorentz	IT_PROG	07-FEB-99
7	124	Mourgos	ST_MAN	16-NOV-99
8	141	Rajs	ST_CLERK	17-OCT-95
9	142	Davies	ST_CLERK	29-JAN-97
10	143	Matos	ST_CLERK	15-MAR-98
...				
19	205	Higgins	AC_MGR	07-JUN-94
20	206	Gietz	AC_ACCOUNT	07-JUN-94

**Answer:**

```
1 SELECT EMPLOYEE_ID AS "Emp_#", LAST_NAME AS "Employee",
2 JOB_ID AS "Job", HIRE_DATE AS "Hire_Date"
3 FROM EMPLOYEES;
```

9. The HR department has requested a report of all employees and their job IDs. Display the last name concatenated with the job ID (separated by a comma and space) and name the column Employee and Title.

	Employee and Title
1	Abel, SA_REP
2	Davies, ST_CLERK
3	De Haan, AD_VP
4	Ernst, IT_PROG
5	Fay, MK_REP
6	Gietz, AC_ACCOUNT
7	Grant, SA_REP
8	Hartstein, MK_MAN
9	Higgins, AC_MGR
10	Hunold, IT_PROG
...	
19	Whalen, AD_ASST
20	Zlotkey, SA_MAN

**Answer:**

```
1 SELECT last_name || ', ' || job_id AS "Employee and Title"
2 FROM employees;
```

10. To familiarize yourself with the data in the EMPLOYEES table, create a query to display all the data from that table. Separate each column output by a comma. Name the column title THE\_OUTPUT.

THE_OUTPUT	
1	100 Steven King KING,515.123.4567,AD_PRES,17-JUN-87,24000,50
2	101 Neena Kochhar MKOCHHAR,515.123.4568,AD_VP,100,21-SEP-89,17000,50
3	102 Lex De Haan LDEHAAN,515.123.4568,AD_VP,100,13-JAN-93,17000,50
4	103 Alexander Hunold AHUNOLD,590.423.4567,IT_PROG,102,03-JAN-80,8000,50
5	104 Bruce Ernst BERNST,590.423.4568,IT_PROG,103,21-MAY-91,6000,50
6	107 Diane Lorentz DLORENTZ,590.423.5567,IT_PROG,103,07-FEB-95,4200,50
7	124 Kevin Mourgos KMOURGOS,650.123.5234,ST_MAN,100,16-NOV-99,5900,50
8	141 Tenna Raju TRAJU,650.121.8008,ST_CLERK,124,17-OCT-85,3500,50
9	142 Curtis Davies CDAVIES,650.121.2994,ST_CLERK,124,29-JAN-97,3100,50
10	143 Randall Meers RMEARS,650.121.2874,ST_CLERK,124,15-MAR-98,2800,50
...	
19	205 Shelley Higgins SHIGGINS,515.123.8080,AC_MGR,101,07-JUN-94,12000,110
20	205 William Gietz WGIETZ,515.123.8161,AC_ACCOUNT,205,07-JUN-94,8300,110

**Answer:**

```
1 SELECT Employee_ID||', '||First_Name||', '||Last_Name||
2 ', '||Email||', '||Phone_Number||', '||Job_ID||', '||
3 Manager_ID||', '||Hire_Date||', '||Commission_Pct||', '||Department_ID
4 FROM HR.EMPLOYEES;
```

## Chapter 2

### Practice 2

1. Because of budget issues, the HR department needs a report that displays the last name and salary of employees who earn more than \$12,000. Save your SQL statement as a file named `lab_02_01.sql`. Run your query.

	LAST_NAME	SALARY
1	King	24000
2	Kochhar	17000
3	De Haan	17000
4	Hartstein	13000

**Answer:**

```
1 SELECT Last_Name , Salary
2 FROM HR.employees
3 WHERE salary > 12000;
```

2. Open a new SQL Worksheet. Create a report that displays the last name and department number for employee number 176. Run the query.

	LAST_NAME	DEPARTMENT_ID
1	Taylor	80

**Answer:**

```
1 SELECT last_name , department_id
2 FROM employees
3 WHERE employee_id = 176;
```

3. The HR department needs to find high-salary and low-salary employees. Modify `lab_02_01.sql` to display the last name and salary for any employee whose salary is not in the range of \$5,000 to \$12,000. Save your SQL statement as `lab_02_03.sql`.

	LAST_NAME	SALARY
1	King	24000
2	Kochhar	17000
3	De Haan	17000
4	Lorentz	4200
5	Rajs	3500
6	Davies	3100
7	Matos	2600
8	Vargas	2500
9	Whalen	4400
10	Hartstein	13000

**Answer:**

```
1 SELECT Last_name , Salary
2 FROM hr.employees
3 WHERE salary NOT BETWEEN 5000 AND 12000;
```

4. Create a report to display the last name, job ID, and hire date for employees with the last names of Matos and Taylor. Order the query in ascending order by the hire date.

	LAST_NAME	JOB_ID	HIRE_DATE
1	Matos	ST_CLERK	15-MAR-98
2	Taylor	SA_REP	24-MAR-98

**Answer:**

```
1 SELECT LAST_NAME , JOB_ID , HIRE_DATE
2 FROM hr.employees
3 WHERE last_name IN ('Matos', 'Taylor')
4 ORDER BY hire_date ASC;
```

5. Display the last name and department ID of all employees in departments 20 or 50 in ascending alphabetical order by name.

	LAST_NAME	DEPARTMENT_ID
1	Davies	50
2	Fay	20
3	Hartstein	20
4	Matos	50
5	Mourgos	50
6	Rajs	50
7	Vargas	50

**Answer:**

```
1 SELECT last_name , department_id
2 FROM hr.employees
3 WHERE department_id IN (20, 50)
4 ORDER BY last_name ASC;
```

6. Modify lab\_02\_03.sql to display the last name and salary of employees who earn between \$5,000 and \$12,000, and are in department 20 or 50. Label the columns Employee and Monthly Salary, respectively. Resave lab\_02\_03.sql as textttlab\_02\_06.sql. Run the statement in lab\_02\_06.sql.

	Employee	Monthly Salary
1	Fay	6000
2	Mourgos	5800

Answer:

```
1 SELECT last_name AS Employee, salary AS "Monthly Salary"
2 FROM hr.employees
3 WHERE salary BETWEEN 5000 AND 12000
4 AND department_id IN (20, 50);
```

7. The HR department needs a report that displays the last name and hire date for all employees who were hired in 1994.

	LAST_NAME	HIRE_DATE
1	Higgins	07-JUN-94
2	Gietz	07-JUN-94

Answer:

```
1 SELECT last_name, hire_date
2 FROM hr.employees
3 WHERE hire_date LIKE '%94';
```

8. Create a report to display the last name and job title of all employees who do not have a manager.

	LAST_NAME	JOB_ID
1	King	AD_PRES

Answer:

```
1 SELECT LAST_NAME, JOB_ID
2 FROM hr.employees
3 WHERE manager_id IS NULL;
```

9. Create a report to display the last name, salary, and commission of all employees who earn commissions. Sort data in descending order of salary and commissions. Use the column numeric position in the ORDER BY clause.

	LAST_NAME	SALARY	COMMISSION_PCT
1	Abel	11000	0.3
2	Zlotkey	10500	0.2
3	Taylor	8600	0.2
4	Grant	7000	0.15

Answer:

```
1 SELECT last_name, salary, commission_pct
2 FROM hr.employees
3 WHERE commission_pct IS NOT NULL
4 ORDER BY 2 DESC, 3 DESC;
```



10. Members of the HR department want to have more flexibility with the queries that you are writing. They would like a report that displays the last name and salary of employees who earn more than an amount that the user specifies after a prompt. Save this query to a file named `lab_02.10.sql`. If you enter 12000 when prompted, the report displays the following results:

	LAST_NAME	SALARY
1	King	24000
2	Kochhar	17000
3	De Haan	17000
4	Hartstein	13000

**Answer: skipped**

11. The HR department wants to run reports based on a manager. Create a query that prompts the user for a manager ID and generates the employee ID, last name, salary, and department for that manager's employees. The HR department wants the ability to sort the report on a selected column. You can test the data with the following values:

manager\_id = 103, sorted by last\_name:

	EMPLOYEE_ID	LAST_NAME	SALARY	DEPARTMENT_ID
1	104	Ernst	6000	60
2	107	Lorentz	4200	60

manager\_id = 201, sorted by salary:

	EMPLOYEE_ID	LAST_NAME	SALARY	DEPARTMENT_ID
1	202	Fay	6000	20

manager\_id = 124, sorted by employee\_id:

	EMPLOYEE_ID	LAST_NAME	SALARY	DEPARTMENT_ID
1	141	Rajs	3500	50
2	142	Davies	3100	50
3	143	Matos	2600	50
4	144	Vargas	2500	50

**Answer: skipped**

12. Display all employee last names in which the third letter of the name is "a."

	LAST_NAME
1	Grant
2	Whalen

**Answer:**

```

1 SELECT last_name
2 FROM hr.employees
3 WHERE last_name LIKE '__a%';

```

13. Display the last names of all employees who have both an “a” and an “e” in their last name.

	LAST_NAME
1	Davies
2	De Haan
3	Hartstein
4	Whalen

**Answer:**

```

1 SELECT last_name
2 FROM hr.employees
3 WHERE last_name LIKE '%a%' AND last_name LIKE '%e%';

```

14. Display the last name, job, and salary for all employees whose jobs are either those of a sales representative or of a stock clerk, and whose salaries are not equal to \$2,500, \$3,500, or \$7,000.

	LAST_NAME	JOB_ID	SALARY
1	Abel	SA_REP	11000
2	Taylor	SA_REP	8600
3	Davies	ST_CLERK	3100
4	Matos	ST_CLERK	2600

**Answer:**

```

1 SELECT last_name, job_id, salary
2 FROM hr.employees
3 WHERE job_id IN ('SA_REP', 'ST_CLERK')
4 AND salary NOT IN (2500, 3500, 7000);

```

15. Modify lab\_02\_06.sql to display the last name, salary, and commission for all employees whose commission is 20%. Resave lab\_02\_06.sql as lab\_02\_15.sql. Rerun the statement in lab\_02\_15.sql.

	Employee	Monthly Salary	COMMISSION_PCT
1	Zlotkey	10500	0.2
2	Taylor	8600	0.2

**Answer:**

```

1 SELECT last_name AS Employee, salary AS "Monthly Salary", commission_pct
2 FROM hr.employees
3 WHERE commission_pct = 0.20;

```