SQL1

Student Guide • Additional Practices

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Additional Practices

Additional Practice Solutions

Additional Practices: Table Descriptions and Data

Additional Practices

These exercises can be used for extra practice after you have discussed the following topics: basic SQL SELECT statement, basic iSQL*Plus commands, and SQL functions.

1. Show all data of the clerks who have been hired after the year 1997.

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DAT
143	Randall	Matos	RMATOS	650.121.2874	15-MAR-96
144	Peter	Vargas	PVARGAS	650.121.2004	09-JUL-98

2. Show the last name, job, salary, and commission of those employees who earn commission. Sort the data by the salary in descending order.

LAST_NAME	JOB_ID	SALARY	COMMISSION_PCT
Abel	SA_REP	11000	3
Zlotkey	SA_MAN	10500	.2
Taylor	SA_REP	8600	.2
Grant	SA_REP	7000	.15

3. Show the employees that have no commission with a 10% raise in their salary (round off the salaries).

New salary	
The salary of King after a 10% raise is 26400	
The salary of Kochhar after a 10% raise is 18700	
The salary of De Haan after a 10% raise is 18700	
The salary of Hunold after a 10% raise is 9900	
The salary of Ernst after a 10% raise is 6600	
The salary of Lorentz after a 10% raise is 4620	
The salary of Mourgos after a 10% raise is 6380	
The salary of Rajs after a 10% raise is 3850	
The salary of Davies after a 10% raise is 3410	
The salary of Matos after a 10% raise is 2860	
The salary of Vargas after a 10% raise is 2750	
The salary of Whalen after a 10% raise is 4840	
The salary of Hartstein after a 10% raise is 14300	
The salary of Fay after a 10% raise is 6600	
New salary	
The salary of Higgins after a 10% raise is 13200	
The salary of Gietz after a 10% raise is 9130	

4. Show the last names of all employees together with the number of years and the number of completed months that they have been employed.

LAST_NAME	YEARS	MONTHS
King	13	9
Kochhar	11	5
De Haan	8	2
Hunold	11	2
Ernst	9	9
Lorentz	2	1
Mourgos	1	4
Rajs	5	5
Davies	4	1
Matos	3	.0
180		
Gietz	ь	(

20 rows selected.

5. Show those employees that have a name starting with J, K, L, or M.

LAST_NAME		
King		
Kochhar		
Lorentz	Ü	
Mourgos Matos	9	
Matos		

6. Show all employees, and indicate with "Yes" or "No" whether they receive a commission.

LAST_NAME	SALARY	COM	
King	24000	No	
Kochhar	17000	No	
De Haan	17000	No	
Hunold	9000	No	
Ernst	6000	No	
Lorentz	4200	No	
Mourgos	5800	No	
Rajs	3500	No	

(**Note:** results continued on next page)

Davies	3100	No
Matos	2600	No
Vargas	2500	No
Zlotkey	10500	Yes
Abel	11000	Yes
Taylor	8600	Yes
LAST_NAME	SALARY	COM
Grant	7000	Yes
Whalen	4400	No
Hartstein	13000	No
Fay	6000	No
Higgins	12000	No
Gietz	8300	No

20 rows selected.

These exercises can be used for extra practice after you have discussed the following topics: SQL basic SELECT statement, basic *i*SQL*Plus commands, SQL functions, joins, and group functions.

7. Show the department names, locations, names, job titles, and salaries of employees who work in location 1800.

DEPARTMENT_NAME	LOCATION_ID	LAST_NAME	JOB_ID	SALARY
Marketing	1800	Hartstein	MK_MAN	13000
Marketing	1800	Fay	MK_REP	6000

8. How many employees have a name that ends with an n? Create two possible solutions.

COUNT(*)	
	3

9. Show the names and locations for all departments, and the number of employees working in each department. Make sure that departments without employees are included as well.

DEPARTMENT_ID	DEPARTMENT_NAME	LOCATION_ID	COUNT(E.EMPLOYEE_ID)
10	Administration	1700	1
20	Marketing	1800	2
50	Shipping	1500	5
60	IT	1400	3
80	Sales	2500	3
90	Executive	1700	3
110	Accounting	1700	2
190	Contracting	1700	0

10. Which jobs are found in departments 10 and 20?

	JOB_ID	
AD_ASST		-
MK_MAN		
MK_REP		

11. Which jobs are found in the Administration and Executive departments, and how many employees do these jobs? Show the job with the highest frequency first.

JOB_ID	FREQUENCY	
AD_VP	2	
AD_ASST	1	
AD_PRES	1	

These exercises can be used for some extra practice after you have discussed the following topics: basic SQL SELECT statements, basic *i*SQL*Plus commands, SQL functions, joins, group functions, subqueries.

12. Show all employees who were hired in the first half of the month (before the 16th of the month).

LAST_NAME	HIRE_DATE
De Haan	13-JAN-93
Hunold	03-JAN-90
Lorentz	07-FEB-99
Matos	15-MAR-98
Vargas	09-JUL-98
Abel	11-MAY-96
Higgins	07-JUN-94
Gietz	07-JUN-94

8 rows selected.

13. Show the names, salaries, and the number of dollars (in thousands) that all employees earn.

LAST_NAME	SALARY	THOUSANDS
King	24000	24
Kochhar	17000	17
De Haan	17000	17
Hunold	9000	9
Ernst	6000	6
Lorentz	4200	4
Mourgos	5800	5
Company of the second		

(**Note:** Results continued on next page)

Rajs	3500	3
Davies	3100	3
Matos	2600	2
Vargas	2500	2
Zlotkey	10500	10
Abel	11000	11
Taylor	8600	8
LAST_NAME	SALARY	THOUSANDS
Grant	7000	7
Whalen	4400	4
Hartstein	13000	13
Fay	6000	6
Higgins	12000	12
Gietz	8300	8

20 rows selected.

14. Show all employees who have managers with a salary higher than \$15,000. Show the following data: employee name, manager name, manager salary, and salary grade of the manager.

LAST_NAME	MANAGER	SALARY	GRA
Kochhar	King	24000	E
De Haan	King	24000	E
Mourgos	King	24000	E
Zlotkey	King	24000	E
Hartstein	King	24000	E
Whalen	Kochhar	17000	E
Higgins	Kochhar	17000	E
Hunold	De Haan	17000	E

15. Show the department number, name, number of employees, and average salary of all departments, together with the names, salaries, and jobs of the employees working in each department.

DEPARTMENT_ID	DEPARTMENT_NAME	EMPLOYEES	AVG_SAL	LAST_NAME	SALARY	100
10	Administration	1	4400.00	Whalen	4400	1
20	Marketing	2	9500.00	Fay	6000	N
				Hartstein	13000	F
50	Shipping	5	3500.00	Davies	3100	T
				Matos	2600	1
				Mourgos	5800	18
				Rajs	3500	9
				Vargas	2500	C
60	ĪT.	3	6400.00	Ernst	6000	T
				Hunold	9000	
				Lorentz	4200	1
80	Sales	3	10033.33	Abel	11000	9
				Taylor	8600	5
				Zlotkey	10500	T
DEPARTMENT_ID	DEPARTMENT_NAME	EMPLOYEES	AVG_SAL	LAST_NAME	SALARY	
90	Executive	3	19333.33	De Haan	17000	
				King	24000	1
				Kochhar	17000	A
110	Accounting	2	10150.00	Gietz	8300	T
				Higgins	12000	3
190	Contracting	0	No average			

20 rows selected. breaks cleared 16. Show the department number and the lowest salary of the department with the highest average salary.

DEPARTMENT_ID	MIN(SALARY)
90	17000

17. Show the department numbers, names, and locations of the departments where no sales representatives work.

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
50	Shipping	124	1500
60	ΙΤ	103	1400
90	Executive	100	1700
110	Accounting	205	1700
190	Contracting		1700

7 rows selected.

- 18. Show the department number, department name, and the number of employees working in each department that:
 - a. Includes fewer than 3 employees:

DEPARTMENT_ID	DEPARTMENT_NAME	COUNT(*)
10	Administration	1
20	Marketing	2
110	Accounting	2

b. Has the highest number of employees:

DEPARTMENT_ID	DEPARTMENT_NAME	COUNT(*)
50	Shipping	5

c. Has the lowest number of employees:

DEPARTMENT_ID	DEPARTMENT_NAME	COUNT(*)
10	Administration	

19. Show the employee number, last name, salary, department number, and the average salary in their department for all employees.

-			
EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID	AVG(S.SALARY)
100	King	90	19333.3333
101	Kochhar	90	19333.3333
102	De Haan	90	19333.3333
103	Hunold	60	6400
104	Ernst	60	6400
107	Lorentz	60	6400
124	Mourgos	50	3500
141	Rajs	50	3500
142	Davies	50	3500
143	Matos	50	3500
144	Vargas	50	3500
149	Zlotkey	80	10033.3333
174	Abel	80	10033.3333
176	Taylor	80	10033.3333
EMPLOYEE_ID	LAST_NAME	DEPARTMENT_ID	AVG(S.SALARY)
200	Whalen	10	4400
201	Hartstein	20	9500
202	Fay	20	9500
205	Higgins	110	10150
206	Gietz	110	10150

¹⁹ rows selected.

20. Show all employees who were hired on the day of the week on which the highest number of employees were hired.

LAST_NAME	DAY
Ernst	TUESDAY
Mourgos	TUESDAY
Rajs	TUESDAY
Taylor	TUESDAY
Higgins	TUESDAY
Gietz	TUESDAY

21. Create an anniversary overview based on the hire date of the employees. Sort the anniversaries in ascending order.

LAST_NAME	BIRTHDAY	
Hunold	January 03	
De Haan	January 13	
Davies	January 29	
Zlotkey	January 29	
Lorentz	February 07	
Hartstein	February 17	
Matos	March 15	
Taylor	March 24	
Abel	May 11	
Ernst	May 21	
Grant	May 24	
Higgins	June 07	
Gietz	June 07	
King	June 17	
LAST_NAME	BIRTHDAY	
Vargas	July 09	
Fay	August 17	
Whalen	September 17	
Kochhar	September 21	
Rajs	October 17	
Mourgos	November 16	

Additional Practice Solutions

These exercises can be used for extra practice after you have discussed the following topics: basic SQL SELECT statement, basic *i*SQL*Plus commands, and SQL functions.

1. Show all data for clerks hired after the year 1997.

```
SELECT *
FROM employees
WHERE job_id = 'ST_CLERK'
AND hire_date > '31-DEC-1997';
```

2. Show the last name, job, salary, and commission of those employees who earn commission. Sort the data by the salary in descending order.

```
SELECT last_name, job_id, salary, commission_pct
FROM employees
WHERE commission_pct IS NOT NULL
ORDER BY salary DESC;
```

3. Show the employees who have no commission, but have a 10% raise in their salary (round off the salaries).

4. Show the last names of all employees together with the number of years and the number of completed months that they have been employed.

```
SELECT last_name,
          TRUNC(MONTHS_BETWEEN(SYSDATE, hire_date) / 12) YEARS,
          TRUNC(MOD(MONTHS_BETWEEN(SYSDATE, hire_date), 12))
MONTHS
FROM employees;
```

5. Show those employees that have a name starting with J, K, L, or M.

```
SELECT last_name
FROM employees
WHERE SUBSTR(last name, 1,1) IN ('J', 'K', 'L', 'M');
```

6. Show all employees, and indicate with "Yes" or "No" whether they receive a commission.

These exercises can be used for extra practice after you have discussed the following topics: SQL basic SELECT statement, basic *i*SQL*Plus commands, SQL functions, joins, and group functions.

7. Show the department names, locations, names, job titles, and salaries of employees who work in location 1800.

8. How many employees have a name that ends with an "n"? Create two possible solutions.

```
SELECT COUNT(*)
FROM employees
WHERE last_name LIKE '%n';

SELECT COUNT(*)
FROM employees
WHERE SUBSTR(last_name, -1) = 'n';
```

9. Show the names and locations for all departments and the number of employees working in each department. Make sure that departments without employees are included as well.

10. Which jobs are found in departments 10 and 20?

```
SELECT DISTINCT job_id
FROM employees
WHERE department_id IN (10, 20);
```

11. Which jobs are found in the administrative and executive departments, and how many employees do these jobs? Show the job with the highest frequency first.

```
SELECT e.job_id, count(e.job_id) FREQUENCY
FROM employees e, departments d
WHERE e.department_id = d.department_id
AND d.department_name IN ('Administration', 'Executive')
GROUP BY e.job_id
ORDER BY FREQUENCY DESC;
```

These exercises can be used for some extra practice after you have discussed the following topics: basic SQL SELECT statements, basic *i*SQL*Plus commands, SQL functions, joins, group functions, subqueries.

12. Show all employees who were hired in the first half of the month (before the 16th of the month).

```
SELECT last_name, hire_date
FROM employees
WHERE TO_CHAR(hire_date, 'DD') < 16;</pre>
```

13. Show the names, salaries, and the number of dollars (in thousands) that each employee earns.

```
SELECT last_name, salary, TRUNC(salary, -3)/1000 Thousands
FROM employees;
```

14. Show all employees who have managers with a salary higher than \$15,000. Show the following data: employee name, manager name, manager salary, and salary grade of the manager.

15. Show the department number, name, number of employees, and average salary of all departments, together with the names, salaries, and jobs of the employees working in each department.

```
BREAK ON department id -
  ON department_name ON employees ON avg_sal SKIP 1
       d.department_id, d.department_name,
SELECT
        count(e1.employee_id) employees,
        NVL(TO_CHAR(AVG(e1.salary), '99999.99'),
        'No average' ) avg sal,
        e2.last_name, e2.salary, e2.job_id
FROM
        departments d, employees e1, employees e2
WHERE
        d.department id = e1.department id(+)
AND
        d.department id = e2.department id(+)
GROUP BY d.department_id, d.department_name,
         e2.last name,
                        e2.salary, e2.job id
ORDER BY d.department_id, employees;
```

CLEAR BREAKS

16. Show the department number and the lowest salary of the department with the highest average salary.

17. Show the department numbers, names, and locations of the departments where no sales representatives work.

- 18. Show the department number and name, and the number of employees working in each department that:
 - a. Has fewer than three employees:

```
SELECT d.department_id, d.department_name, COUNT(*)
FROM departments d, employees e
WHERE d.department_id = e.department_id
GROUP BY d.department_id, d.department_name
HAVING COUNT(*) < 3;</pre>
```

SQL1 Additional Practice Solutions-5

b. Has the highest number of employees:

```
SELECT d.department_id, d.department_name, COUNT(*)
FROM
       departments d, employees e
WHERE d.department id = e.department id
GROUP BY d.department id, d.department name
HAVING COUNT(*) = (SELECT MAX(COUNT(*))
                    FROM
                           employees
                    GROUP BY department id);
c. Has the lowest number of employees:
SELECT d.department_id, d.department_name, COUNT(*)
       departments d, employees e
FROM
WHERE d.department id = e.department id
GROUP BY d.department_id, d.department_name
HAVING COUNT(*) = (SELECT MIN(COUNT(*))
                   FROM
                           employees
                   GROUP BY department_id);
```

19. Show the employee number, last name, salary, department number, and the average salary in their department for all employees.

20. Show all employees who were hired on the day of the week on which the highest number of employees were hired.

21. Create an anniversary overview based on the hire date of the employees. Sort the anniversaries in ascending order.

```
SELECT last_name, TO_CHAR(hire_date, 'Month DD') BIRTHDAY
FROM employees
ORDER BY TO_CHAR(hire_date, 'DDD');
```

Table Descriptions and Data

COUNTRIES Table

DESCRIBE countries

Name	Null?	Туре
COUNTRY_ID	NOT NULL	CHAR(2)
COUNTRY_NAME		VARCHAR2(40)
REGION_ID		NUMBER

SELECT * FROM countries;

CO	COUNTRY_NAME	REGION_ID
CA	Canada	2
DE	Germany	1
JK United Kingdom		1
US	United States of America	2

DEPARTMENTS Table

DESCRIBE departments

Name	Null?	Туре
DEPARTMENT_ID	NOT NULL	NUMBER(4)
DEPARTMENT_NAME	NOT NULL	VARCHAR2(30)
MANAGER_ID		NUMBER(6)
LOCATION_ID		NUMBER(4)

SELECT * FROM departments;

DEPARTMENT_ID	DEPARTMENT_NAME	MANAGER_ID	LOCATION_ID
10	Administration	200	1700
20	Marketing	201	1800
50	Shipping	124	1500
60	IT	103	1400
80	Sales	149	2500
90	Executive	100	1700
110	Accounting	205	1700
190	Contracting		1700

EMPLOYEES Table

DESCRIBE employees

Name	Null?	Туре
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)

SELECT * FROM employees;

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID
100	Steven	King	SKING	515.123.4567	17-JUN-87	AD_PRES
101	Neena	Kochhar	NKOCHHAR	515.123.4568	21-SEP-89	AD_VP
102	Lex	De Haan	LDEHAAN	515.123.4569	13-JAN-93	AD_VP
103	Alexander	Hunold	AHUNOLD	590.423.4567	03-JAN-90	IT_PROG
104	Bruce	Ernst	BERNST	590.423.4568	21-MAY-91	IT_PROG
107	Diana	Lorentz	DLORENTZ	590.423.5567	07-FEB-99	IT_PROG
124	Kevin	Mourgos	KMOURGOS	650.123.5234	16-NOV-99	ST_MAN
141	Trenna	Rajs	TRAJS	650.121.8009	17-OCT-95	ST_CLERK
142	Curtis	Davies	CDAVIES	650.121.2994	29-JAN-97	ST_CLERK
143	Randall	Matos	RMATOS	650.121.2874	15-MAR-98	ST_CLERK
144	Peter	Vargas	PVARGAS	650.121.2004	09-JUL-98	ST_CLERK
149	Eleni	Zlotkey	EZLOTKEY	011.44.1344.429018	29-JAN-00	SA_MAN
174	Ellen	Abel	EABEL	011.44.1644.429267	11-MAY-96	SA_REP
176	Jonathon	Taylor	JTAYLOR	011.44.1644.429265	24-MAR-98	SA_REP
178	Kimberely	Grant	KGRANT	011.44.1644.429263	24-MAY-99	SA_REP
200	Jennifer	Whalen	JWHALEN	515.123.4444	17-SEP-87	AD_ASST
201	Michael	Hartstein	MHARTSTE	515.123.5555	17-FEB-96	MK_MAN
202	Pat	Fay	PFAY	603.123.6666	17-AUG-97	MK_REP
205	Shelley	Higgins	SHIGGINS	515.123.8080	07-JUN-94	AC_MGR
206	William	Gietz	WGIETZ	515.123.8181	07-JUN-94	AC_ACCOUNT

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EMPLOYEES Table (continued)

SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
24000			90
17000		100	90
17000		100	90
9000		102	60
6000		103	60
4200		103	60
5800		100	50
3500		124	50
3100		124	50
2600		124	50
2500		124	50
10500	.2	100	80
11000	.3	149	80
8600	.2	149	80
7000	.15	149	
4400		101	10
13000		100	20
6000		201	20
12000		101	110
8300		205	110

JOBS Table

DESCRIBE jobs

Name	Null?	Туре
JOB_ID	NOT NULL	VARCHAR2(10)
JOB_TITLE	NOT NULL	VARCHAR2(35)
MIN_SALARY		NUMBER(6)
MAX_SALARY		NUMBER(6)

SELECT * FROM jobs;

JOB_ID	JOB_TITLE	MIN_SALARY	MAX_SALARY
AD_PRES	President	20000	40000
AD_VP	Administration Vice President	15000	30000
AD_ASST	Administration Assistant	3000	6000
AC_MGR	Accounting Manager	8200	16000
AC_ACCOUNT	Public Accountant	4200	9000
SA_MAN	Sales Manager	10000	20000
SA_REP	Sales Representative	6000	12000
ST_MAN	Stock Manager	5500	8500
ST_CLERK	Stock Clerk	2000	5000
IT_PROG	Programmer	4000	10000
MK_MAN	Marketing Manager	9000	15000
MK_REP	Marketing Representative	4000	9000

JOB_GRADES Table

DESCRIBE job_grades

Name	Null?	Туре	
GRADE_LEVEL		VARCHAR2(3)	
LOWEST_SAL		NUMBER	
HIGHEST_SAL		NUMBER	

SELECT * FROM job_grades;

GRA	LOWEST_SAL	HIGHEST_SAL
A	1000	2999
В	3000	5999
С	6000	9999
D	10000	14999
E	15000	24999
F	25000	40000

JOB_HISTORY Table

DESCRIBE job_history

Name	Null?	Туре
EMPLOYEE_ID	NOT NULL	NUMBER(6)
START_DATE	NOT NULL	DATE
END_DATE	NOT NULL	DATE
JOB_ID	NOT NULL	VARCHAR2(10)
DEPARTMENT_ID		NUMBER(4)

SELECT * FROM job_history;

EMPLOYEE_ID	START_DAT	END_DATE	JOB_ID	DEPARTMENT_ID
102	13-JAN-93	24-JUL-98	IT_PROG	60
101	21-SEP-89	27-OCT-93	AC_ACCOUNT	110
101	28-OCT-93	15-MAR-97	AC_MGR	110
201	17-FEB-96	19-DEC-99	MK_REP	20
114	24-MAR-98	31-DEC-99	ST_CLERK	50
122	01-JAN-99	31-DEC-99	ST_CLERK	50
200	17-SEP-87	17-JUN-93	AD_ASST	90
176	24-MAR-98	31-DEC-98	SA_REP	80
176	01-JAN-99	31-DEC-99	SA_MAN	80
200	01-JUL-94	31-DEC-98	AC_ACCOUNT	90

LOCATIONS Table

DESCRIBE locations

Name	Null?	Туре
LOCATION_ID	NOT NULL	NUMBER(4)
STREET_ADDRESS		VARCHAR2(40)
POSTAL_CODE		VARCHAR2(12)
CITY	NOT NULL	VARCHAR2(30)
STATE_PROVINCE		VARCHAR2(25)
COUNTRY_ID		CHAR(2)

SELECT * FROM locations;

LOCATION_ID	STREET_ADDRESS	POSTAL_CODE	CITY	STATE_PROVINCE	CO
1400	2014 Jabberwocky Rd	26192	Southlake	Texas	US
1500	2011 Interiors Blvd	99236	South San Francisco	California	US
1700	2004 Charade Rd	98199	Seattle	Washington	US
1800	460 Bloor St. W.	ON M5S 1X8	Toronto	Ontario	CA
2500	Magdalen Centre, The Oxford Science Park	0х9 9ZB	Oxford	Oxford	UK

REGIONS Table

DESCRIBE regions

Name	Null?	Туре	
REGION_ID	NOT NULL	NUMBER	
REGION_NAME		VARCHAR2(25)	

SELECT * FROM regions;

REGION_ID	REGION_NAME	
1	Europe	
2	Americas	
3	Asia	
4	Middle East and Africa	