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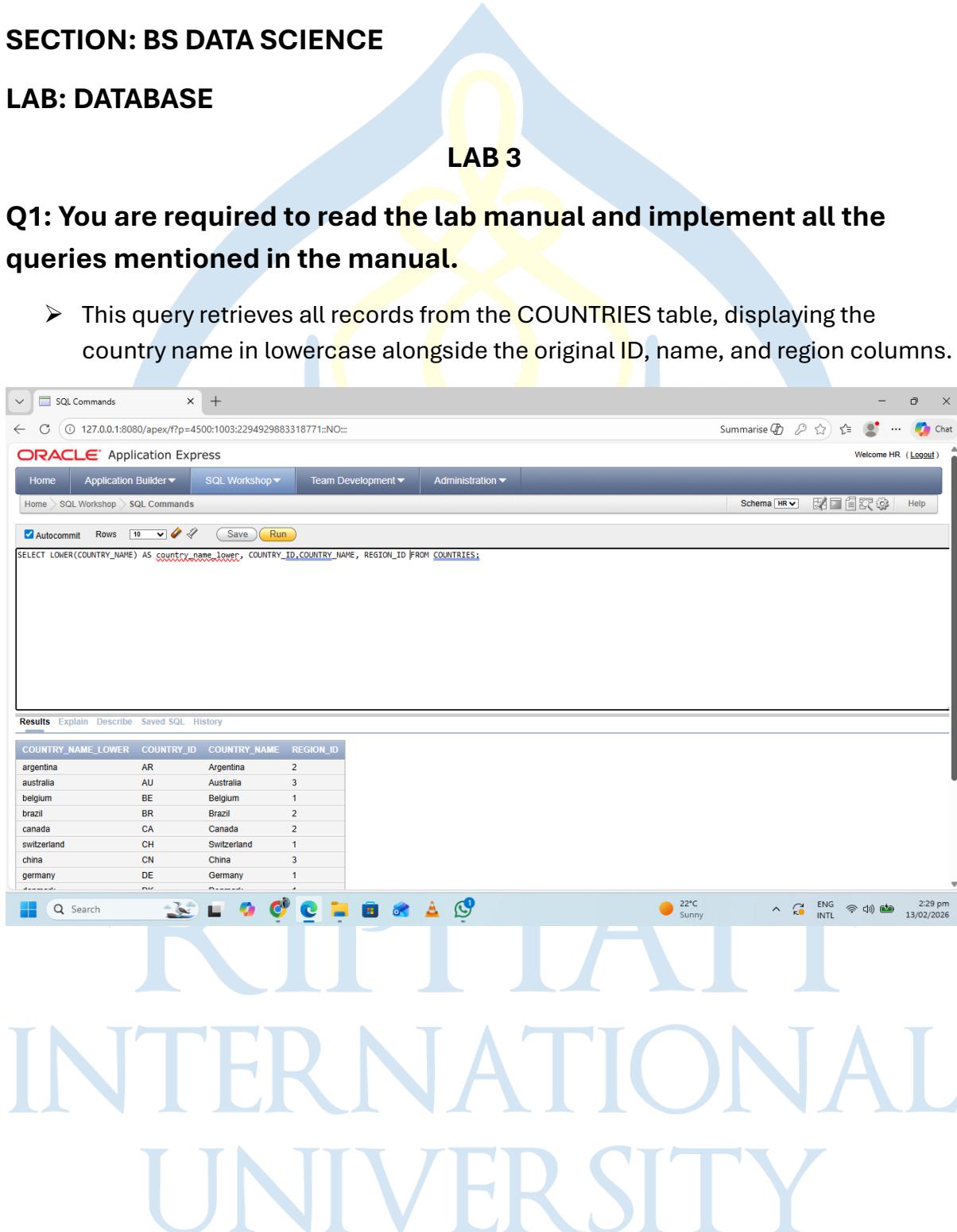
SECTION: BS DATA SCIENCE

LAB: DATABASE

LAB 3

Q1: You are required to read the lab manual and implement all the queries mentioned in the manual.

- This query retrieves all records from the COUNTRIES table, displaying the country name in lowercase alongside the original ID, name, and region columns.



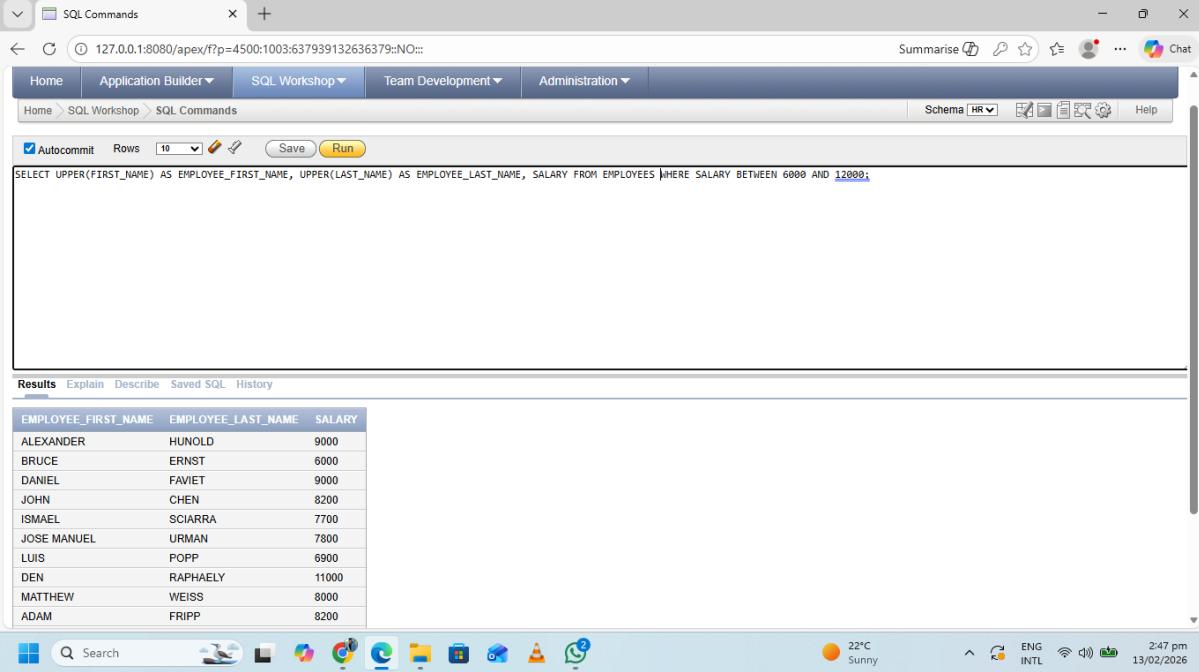
A screenshot of an Oracle Application Express SQL Workshop window. The URL in the address bar is 127.0.0.1:8080/apex/f?p=4500:1003:2294929883318771::NO::. The page title is "ORACLE® Application Express". The SQL command entered is:

```
SELECT LOWER(COUNTRY_NAME) AS country_name_lower, COUNTRY_ID, COUNTRY_NAME, REGION_ID FROM COUNTRIES;
```

The results show the following data:

COUNTRY_NAME_LOWER	COUNTRY_ID	COUNTRY_NAME	REGION_ID
argentina	AR	Argentina	2
australia	AU	Australia	3
belgium	BE	Belgium	1
brazil	BR	Brazil	2
canada	CA	Canada	2
switzerland	CH	Switzerland	1
china	CN	China	3
germany	DE	Germany	1

- The query selects all columns from the COUNTRIES table while creating an additional column that converts every country name into lowercase characters.



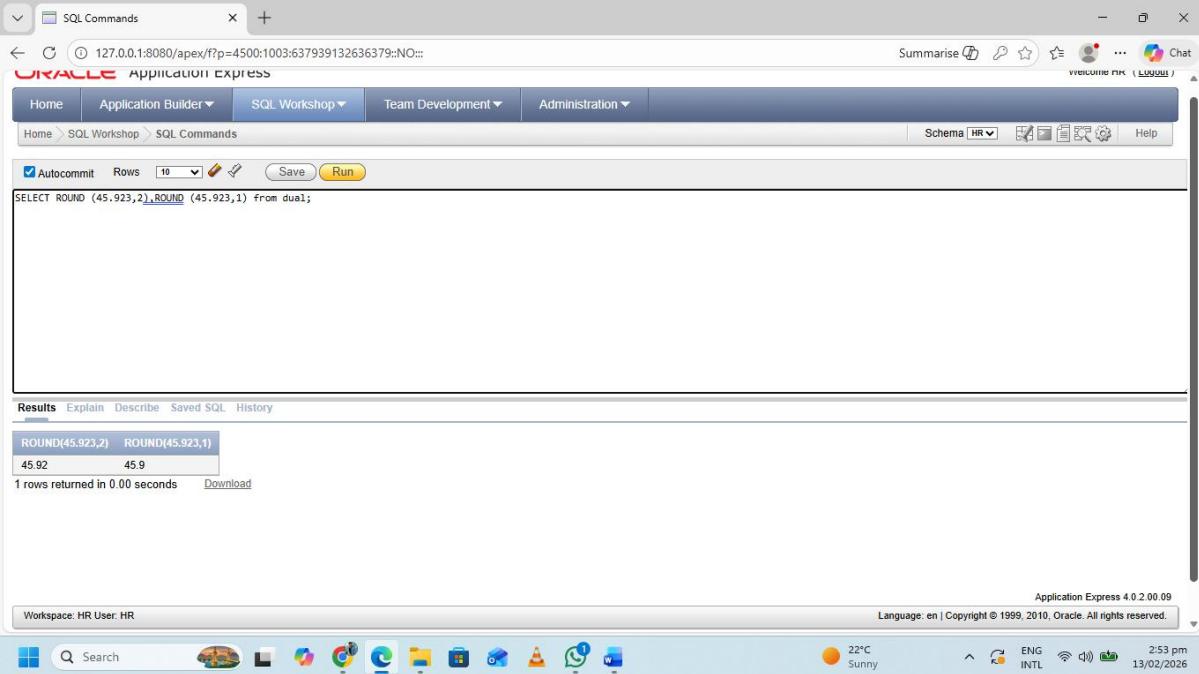
The screenshot shows the Oracle Application Express interface. In the top navigation bar, the path is Home > SQL Workshop > SQL Commands. The SQL editor contains the following query:

```
SELECT UPPER(FIRST_NAME) AS EMPLOYEE_FIRST_NAME, UPPER(LAST_NAME) AS EMPLOYEE_LAST_NAME, SALARY FROM EMPLOYEES WHERE SALARY BETWEEN 6000 AND 12000;
```

The results pane displays the following data:

EMPLOYEE_FIRST_NAME	EMPLOYEE_LAST_NAME	SALARY
ALEXANDER	HUNOLD	9000
BRUCE	ERNST	6000
DANIEL	FAVIET	9000
JOHN	CHEN	8200
ISMAEL	SCIARRA	7700
JOSE MANUEL	URMAN	7800
LUIS	POPP	6900
DEN	RAPHAELY	11000
MATTHEW	WEISS	8000
ADAM	FRIPP	8200

- The query displays country names in lowercase and lists all other column details from the countries table.



The screenshot shows the Oracle Application Express interface. In the top navigation bar, the path is Home > SQL Workshop > SQL Commands. The SQL editor contains the following query:

```
SELECT ROUND(45.923,2),ROUND(45.923,1) from dual;
```

The results pane displays the following data:

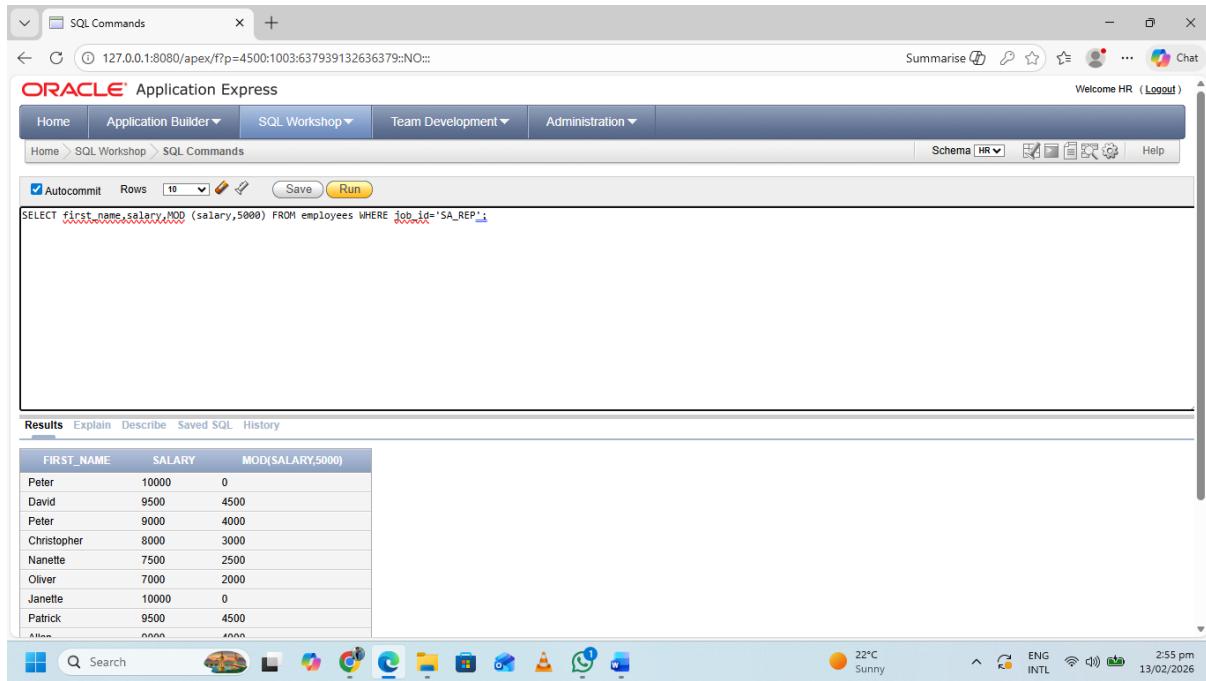
ROUND(45.923,2)	ROUND(45.923,1)
45.92	45.9

1 rows returned in 0.00 seconds

Application Express 4.0.2.00.09

Workspace: HR User: HR Language: en | Copyright © 1999, 2010, Oracle. All rights reserved.

- The query calculates and displays the remainder (leftover amount) of each sales representative's salary after dividing it by 5,000.



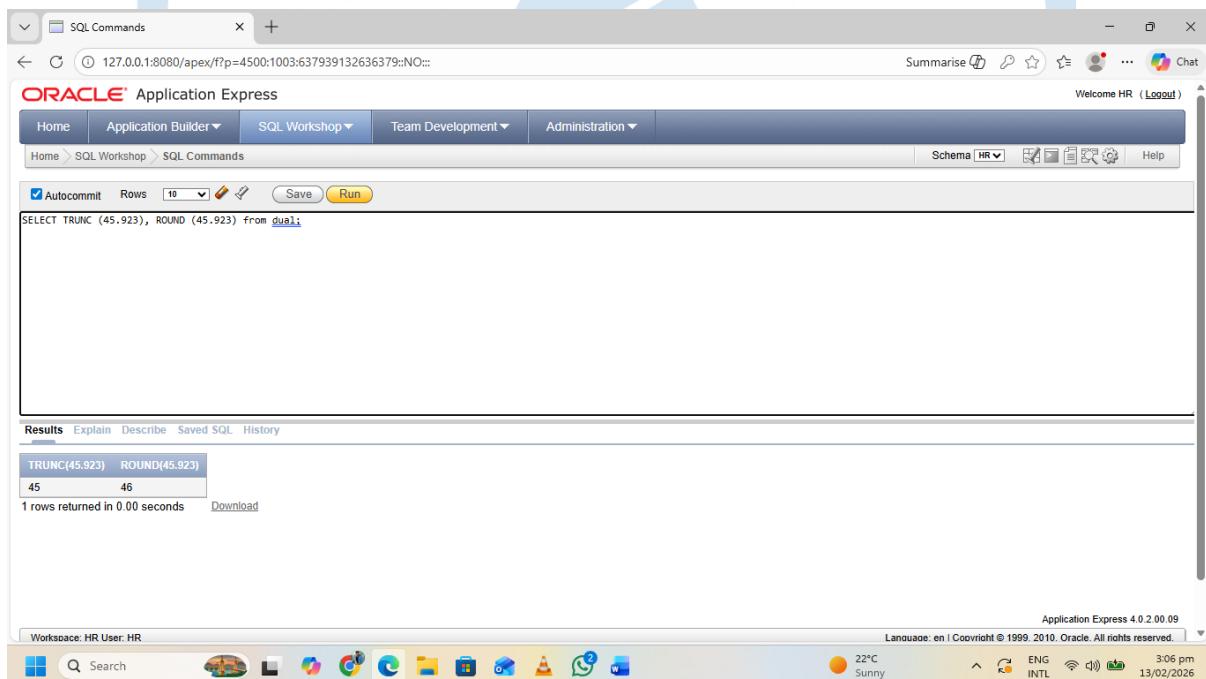
The screenshot shows the Oracle Application Express interface. A SQL command is entered in the SQL Commands window:

```
SELECT first_name, salary MOD (salary,5000) FROM employees WHERE job_id='SA_REP';
```

The results show the first names and their corresponding remainders when their salaries are divided by 5,000:

FIRST_NAME	SALARY	MOD(SALARY,5000)
Peter	10000	0
David	9500	4500
Peter	9000	4000
Christopher	8000	3000
Nanette	7500	2500
Oliver	7000	2000
Janette	10000	0
Patrick	9500	4500
Alion	8000	4000

- This query calculates the remainder (leftover amount) of each sales representative's salary after it is divided by 5,000.



The screenshot shows the Oracle Application Express interface. A SQL command is entered in the SQL Commands window:

```
SELECT TRUNC(45.923), ROUND(45.923) from dual;
```

The results show the truncated and rounded values of 45.923:

TRUNC(45.923)	ROUND(45.923)
45	46

1 rows returned in 0.00 seconds

- The query displays all details for employees who have an even-numbered salary (where the salary is exactly divisible by 2).

The screenshot shows the Oracle Application Express interface. In the SQL Commands window, the following query is run:

```
SELECT * FROM employees WHERE MOD(salary, 2) = 0;
```

The results show a list of employees from the HR schema, filtered by those whose salary is even (divisible by 2). The output is as follows:

EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
100	Steven	King	SKING	515.123.4567	06/17/2003	AD_PRES	24000	-	-	90
101	Neena	Kochhar	NKOCHHAR	515.123.4568	09/21/2005	AD_VP	17000	-	100	90
102	Lex	De Haan	LDEHAAN	515.123.4569	01/13/2001	AD_VP	17000	-	100	90
103	Alexander	Hunold	AHUNOLD	590.423.4567	01/03/2006	IT_PROG	9000	-	102	60
104	Bruce	Ernst	BERNST	590.423.4568	05/21/2007	IT_PROG	6000	-	103	60
105	David	Austin	DAUSTIN	590.423.4569	06/25/2005	IT_PROG	4800	-	103	60
106	Valli	Pataballa	VPATABAL	590.423.4560	02/05/2006	IT_PROG	4800	-	103	60
107	Diana	Lorentz	DLORENTZ	590.423.5567	02/07/2007	IT_PROG	4200	-	103	60
108	Marcus	Greenberg	MGRGREEN	545.123.4560	08/17/2002	FI_MGR	12000	-	101	100

- The query adds the numbers 10 and 20 together and displays the result (30) under a column titled "SUM".

The screenshot shows the Oracle Application Express interface. In the SQL Commands window, the following query is run:

```
SELECT 10 + 20 AS SUM FROM DUAL;
```

The results show a single row with a column named 'SUM' containing the value 30.

SUM
30

1 rows returned in 0.00 seconds

- This query calculates the exact number of months between two specific dates: September 1, 1995, and January 11, 1994.

The screenshot shows the Oracle Application Express interface. The SQL command entered is:

```
SELECT MONTHS_BETWEEN (TO_DATE('01-SEP-95', 'DD-MON-YY'), TO_DATE('11-JAN-94', 'DD-MON-YY')) AS months_difference FROM dual;
```

The results section shows the output:

MONTHS_DIFFERENCE
19.6774193548387096774193548387096774194

1 rows returned in 0.01 seconds

At the bottom of the window, it says "Application Express 4.0.2.00.09" and "Language: en | Copyright © 1999, 2010, Oracle. All rights reserved."

- This query calculates a new date by adding six months to the specific date of January 11, 1994.

The screenshot shows the Oracle Application Express interface. The SQL command entered is:

```
SELECT ADD_MONTHS(TO_DATE('11-JAN-94', 'DD-MON-YY'), 6) AS new_date FROM dual;
```

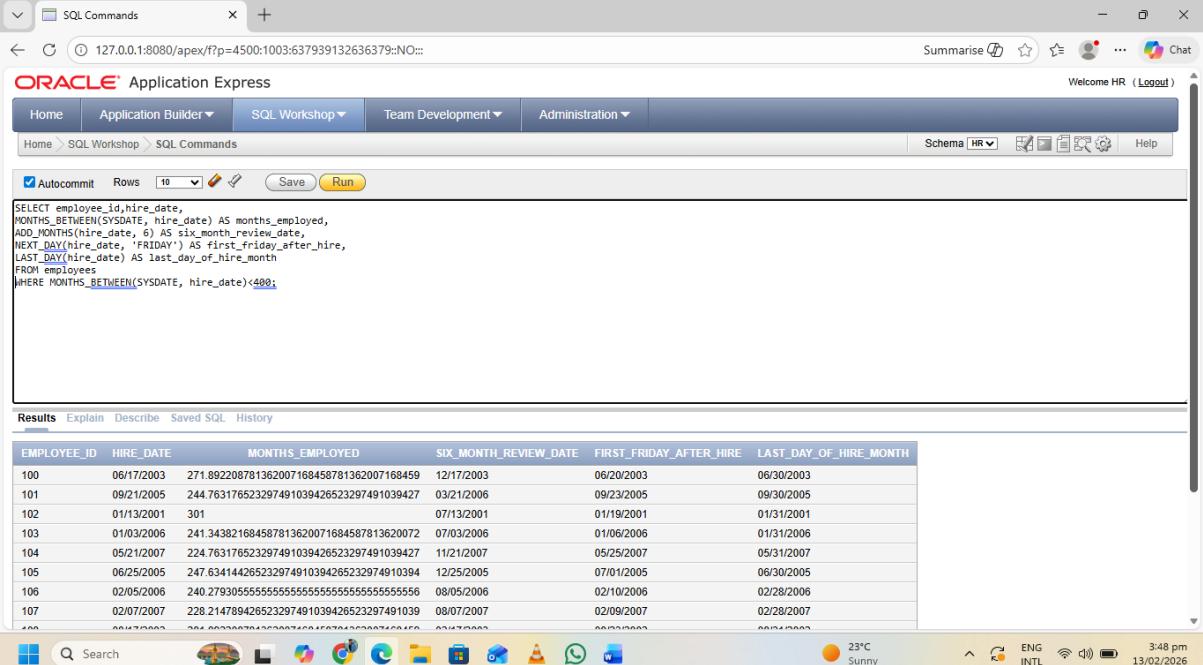
The results section shows the output:

NEW_DATE
07/11/2094

1 rows returned in 0.01 seconds

At the bottom of the window, it says "Application Express 4.0.2.00.09" and "Language: en | Copyright © 1999, 2010, Oracle. All rights reserved."

- This query calculates and shows important work dates for employees, like how many months they have worked, their 6-month review date, and their first Friday on the job.



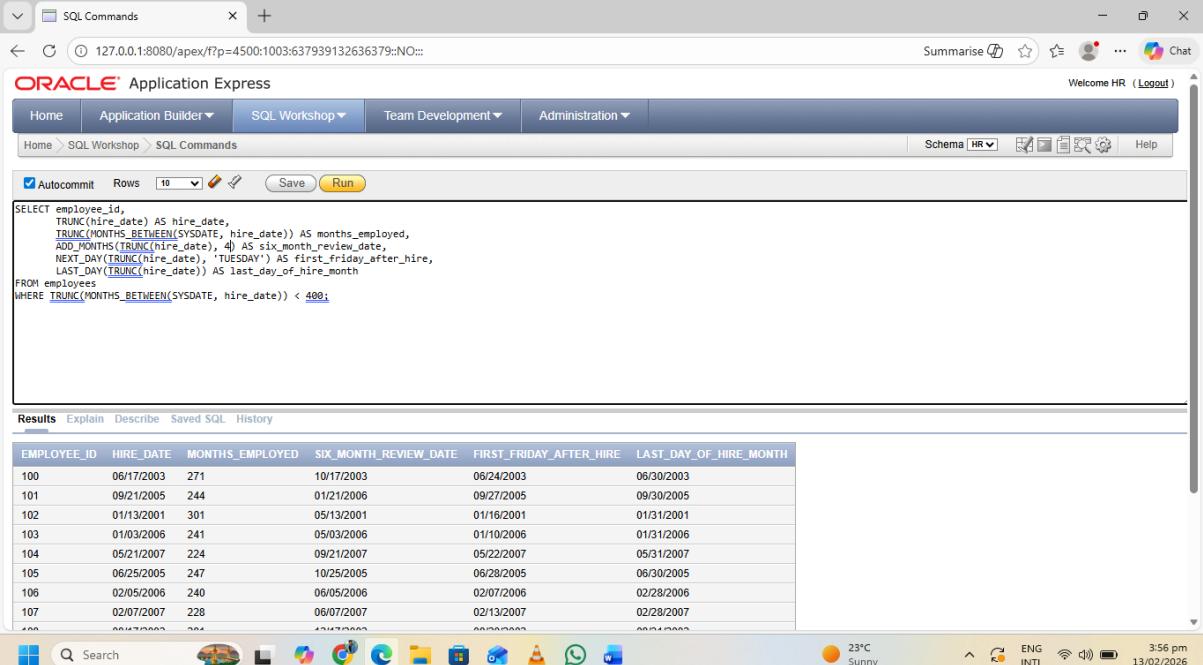
The screenshot shows the Oracle Application Express interface. The URL is 127.0.0.1:8080/apex/f?p=4500:1003:637939132636379::NO:::. The page title is "SQL Commands". The SQL code is:

```
SELECT employee_id, hire_date,
       MONTHS_BETWEEN(sysdate, hire_date) AS months_employed,
       ADD_MONTHS(hire_date, 6) AS six_month_review_date,
       NEXT_DAY(hire_date, 'FRIDAY') AS first_friday_after_hire,
       LAST_DAY(hire_date) AS last_day_of_hire_month
  FROM employees
 WHERE MONTHS_BETWEEN(sysdate, hire_date) < 400;
```

The results table has columns: EMPLOYEE_ID, HIRE_DATE, MONTHS_EMPLOYED, SIX_MONTH REVIEW_DATE, FIRST_FRIDAY_AFTER_HIRE, LAST_DAY_OF_HIRE_MONTH. The data is as follows:

EMPLOYEE_ID	HIRE_DATE	MONTHS_EMPLOYED	SIX_MONTH REVIEW_DATE	FIRST_FRIDAY_AFTER_HIRE	LAST_DAY_OF_HIRE_MONTH
100	06/17/2003	271	10/17/2003	06/24/2003	06/30/2003
101	09/21/2005	244	03/21/2006	09/23/2005	09/30/2005
102	01/13/2001	301	05/13/2001	01/19/2001	01/31/2001
103	01/03/2006	241	07/03/2006	01/06/2006	01/31/2006
104	05/01/2007	224	11/21/2007	05/25/2007	05/31/2007
105	06/25/2005	247	12/25/2005	07/01/2005	06/30/2005
106	02/05/2006	240	08/05/2006	02/10/2006	02/28/2006
107	02/07/2007	228	08/07/2007	02/09/2007	02/28/2007

- This query calculates employee work milestones—like total months worked and review dates—but uses the TRUNC function to remove all decimal points for a cleaner, whole-number display.



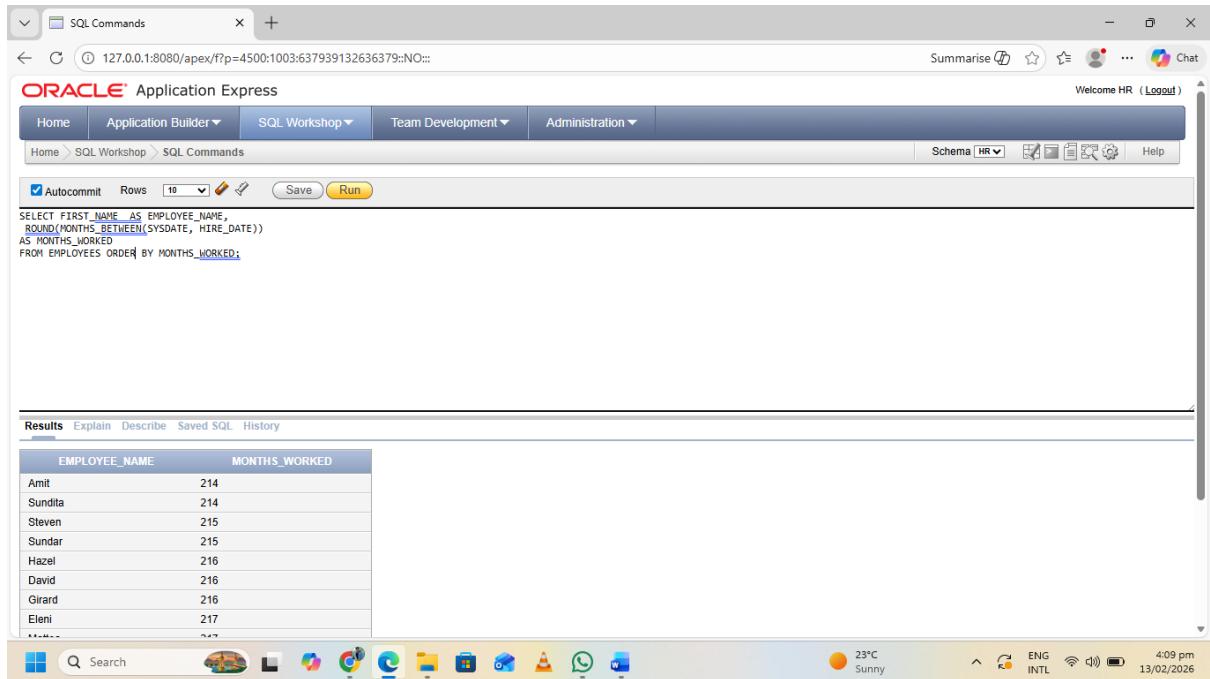
The screenshot shows the Oracle Application Express interface. The URL is 127.0.0.1:8080/apex/f?p=4500:1003:637939132636379::NO:::. The page title is "SQL Commands". The SQL code is:

```
SELECT employee_id,
       TRUNC(hire_date) AS hire_date,
       TRUNC(MONTHS_BETWEEN(sysdate, hire_date)) AS months_employed,
       ADD_MONTHS(TRUNC(hire_date), 6) AS six_month_review_date,
       NEXT_DAY(TRUNC(hire_date), 'TUESDAY') AS first_friday_after_hire,
       LAST_DAY(TRUNC(hire_date)) AS last_day_of_hire_month
  FROM employees
 WHERE TRUNC(MONTHS_BETWEEN(sysdate, hire_date)) < 400;
```

The results table has columns: EMPLOYEE_ID, HIRE_DATE, MONTHS_EMPLOYED, SIX_MONTH REVIEW_DATE, FIRST_FRIDAY_AFTER_HIRE, LAST_DAY_OF_HIRE_MONTH. The data is as follows:

EMPLOYEE_ID	HIRE_DATE	MONTHS_EMPLOYED	SIX_MONTH REVIEW_DATE	FIRST_FRIDAY_AFTER_HIRE	LAST_DAY_OF_HIRE_MONTH
100	06/17/2003	271	10/17/2003	06/24/2003	06/30/2003
101	09/21/2005	244	03/21/2006	09/27/2005	09/30/2005
102	01/13/2001	301	05/13/2001	01/16/2001	01/31/2001
103	01/03/2006	241	05/03/2006	01/10/2006	01/31/2006
104	05/01/2007	224	09/21/2007	05/22/2007	05/31/2007
105	06/25/2005	247	10/25/2005	06/28/2005	06/30/2005
106	02/05/2006	240	06/05/2006	02/07/2006	02/28/2006
107	02/07/2007	228	06/07/2007	02/13/2007	02/28/2007

- This query lists employee names and their total months of service, rounded to the nearest whole number and sorted from least to most time worked.



The screenshot shows the Oracle Application Express interface. The top navigation bar includes Home, Application Builder, SQL Workshop (selected), Team Development, Administration, and a user welcome message. Below the navigation is a toolbar with Autocommit checked, Row count set to 10, and Save/Run buttons. The main area contains the following SQL code:

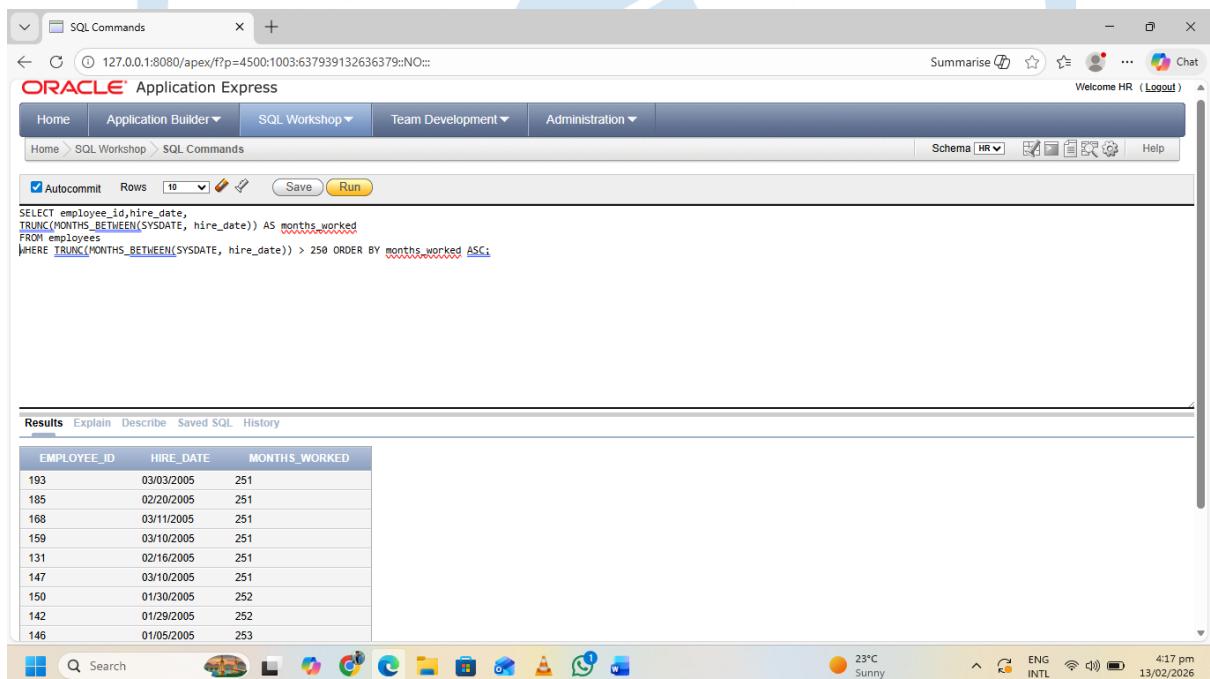
```
SELECT FIRST_NAME AS EMPLOYEE_NAME,
ROUND(MONTHS_BETWEEN(SYSDATE, HIRE_DATE))
AS MONTHS_WORKED
FROM EMPLOYEES ORDER BY MONTHS_WORKED;
```

The Results tab is selected, displaying a table with two columns: EMPLOYEE_NAME and MONTHS_WORKED. The data is as follows:

EMPLOYEE_NAME	MONTHS_WORKED
Amit	214
Sundita	214
Steven	215
Sundar	215
Hazel	216
David	216
Girard	216
Eleni	217
...More...	217

The system status bar at the bottom indicates it's 23°C Sunny, 4:09 pm, ENG INTL, and the date is 13/02/2026.

- This query lists IDs and hire dates for employees who have worked more than 250 months, showing their total time served as a whole number.



The screenshot shows the Oracle Application Express interface, identical to the previous one but with a different query. The top navigation bar and toolbar are the same. The main area contains the following SQL code:

```
SELECT employee_id,hire_date,
TRUNC(MONTHS_BETWEEN(SYSDATE, hire_date)) AS months_worked
FROM employees
WHERE TRUNC(MONTHS_BETWEEN(SYSDATE, hire_date)) > 250 ORDER BY months_worked ASC;
```

The Results tab is selected, displaying a table with three columns: EMPLOYEE_ID, HIRE_DATE, and MONTHS_WORKED. The data is as follows:

EMPLOYEE_ID	HIRE_DATE	MONTHS_WORKED
193	03/03/2005	251
185	02/02/2005	251
168	03/11/2005	251
159	03/10/2005	251
131	02/16/2005	251
147	03/10/2005	251
150	01/30/2005	252
142	01/29/2005	252
146	01/05/2005	253

The system status bar at the bottom indicates it's 23°C Sunny, 4:17 pm, ENG INTL, and the date is 13/02/2026.

- This query calculates an employee's total yearly income by multiplying their monthly salary by 12 and adding their commission, while treating missing commission values as zero.



A screenshot of an Oracle Application Express SQL Workshop window. The URL in the address bar is 127.0.0.1:8080/apex/f?p=4500:1003:637939132636379::NO:::. The SQL command entered is:

```
SELECT first_name, salary, commission_pct, 0,(salary*12)+NVL(commission_pct,0)FROM employees;
```

The results show the calculated yearly income for each employee:

FIRST_NAME	SALARY	COMMISSION_PCT	0	(SALARY*12)+NVL(COMMISSION_PCT,0)
Steven	24000	-	0	288000
Neena	17000	-	0	204000
Lex	17000	-	0	204000
Alexander	9000	-	0	108000
Bruce	6000	-	0	72000
David	4800	-	0	57600
Valli	4800	-	0	57600
Diana	4200	-	0	50400
Mark	10000	-	0	120000

LAB TASK QUERY:

Q2: Create a query that will display the employee name and commission amount. If the employee does not earn commission put 99 label the column commission_pct.

- This query calculates an employee's total yearly income by multiplying their salary by 12 and adding their commission, while automatically using 99 as the commission value if none is found.

The screenshot shows a Windows desktop environment with a Oracle Database SQL Workshop window open. The window title is "SQL Commands". The URL in the address bar is "127.0.0.1:8080/apex/f?p=4500:1003:637939132636379::NO::". The menu bar includes Home, Application Builder, SQL Workshop, Team Development, Administration, and Help. The toolbar has options for Autocommit, Rows (set to 100), Save, and Run. The SQL editor contains the following query:

```
SELECT first_name,salary,commission_pct,(salary*12)+NVL(commission_pct,99)FROM employees;
```

The Results tab displays the output of the query:

FIRST_NAME	SALARY	COMMISSION_PCT	(SALARY*12)+NVL(COMMISSION_PCT,99)
Steven	24000	-	288099
Neena	17000	-	204099
Lex	17000	-	204099
Alexander	9000	-	108099
Bruce	6000	-	72099
David	4800	-	57699
Valli	4800	-	57699
Diana	4200	-	50499
Nancy	12008	-	144195
Daniel	9000	-	108099

The system tray at the bottom shows icons for search, file explorer, browser, and other system utilities. The taskbar shows the date and time as 13/02/2026 and 4:39 pm. The weather icon indicates it's 23°C and sunny.

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