Q1. Write a SQL query to find the first_name, last_name, and the number of days each student has been enrolled. Hint: don't forget the constants that exist in the database. The database schema consists of a single table, students. This table stores each students first_name, last_name and enrolment_date.

Q2. Write a SQL query to select the first_name and hire_date of all employees who were hired in the year 2023. The database schema consists of a table, employees. It includes the first_name, last_name and hire_date of all employees.

Q3. We have Employee table and Department table as shown below.

	employeeid [PK] integer	firstname character varying (50)	lastname character varying (50)	departmentid integer	businessid integer
1	1	Alice	Smith	100	1
2	2	Bob	Johnson	101	1
3	3	Charlie	Williams	102	2
4	4	David	Jones	105	2
5	5	Emily	Li	104	4

	departmentid [PK] integer	departmentname character varying (50)	managerid integer	businessid integer
1	100	Sales	1	1
2	101	Marketing	2	3
3	102	HR	5	2
4	104	Finance	4	4
5	105	Design	4	5

Part 1: Write a query using an INNER JOIN to retrieve a list of employees and their corresponding department names.

Part 2: Write a query using a NATURAL JOIN to retrieve a list of employees and their corresponding department names. Discuss how this result differs from the INNER JOIN.

Sample Solutions:

Q1.

SELECT first_name, last_name, CURRENT_DATE - enrolment_date AS days_enroled FROM students;

Q2.

SELECT first_name, hire_date FROM employees WHERE EXTRACT (YEAR FROM hire_date) = 2023;

Q3.

Part 1

Query | Query History

```
1  SELECT employees.employeeid, employees.firstname, employees.lastname,
2      departments.departmentname, employees.businessid
3  FROM
4      Employees
5  INNER JOIN
6      Departments
7  ON
8      Employees.DepartmentID = Departments.DepartmentID;
```

Data Output | Messages | Notifications

	employeeid integer	firstname character varying (50)	lastname character varying (50)	departmentname character varying (50)	businessid integer
1	1	Alice	Smith	Sales	1
2	2	Bob	Johnson	Marketing	1
3	3	Charlie	Williams	HR	2
4	4	David	Jones	Design	2
5	5	Emily	Li	Finance	4

Part 2

Query | Query History

```
1  SELECT
2      EmployeeID,
3      FirstName,
4      LastName,
5      DepartmentName,
6      Businessid
7  FROM
8      Employees
9  NATURAL JOIN
10     Departments;
```

Data Output | Messages | Notifications

SQL

	employeeid integer	firstname character varying (50)	lastname character varying (50)	departmentname character varying (50)	businessid integer
1	1	Alice	Smith	Sales	1
2	3	Charlie	Williams	HR	2
3	5	Emily	Li	Finance	4

Total rows: 3 of 3 | Query complete 00:00:00.070

Differences:

Inner Join explicitly joins the 'Employees' and 'Departments' table based on the 'DepartmentID' field. Only employees who have matching 'DepartmentID' will be included. Natural Join automatically joins the tables based on all the columns with the same name (in this case 'DepartmentID' and 'BusinessID'). You do not specify the join condition; the database assumes that you want to join on all common columns. Here it excludes Bob and David from results as they don't match perfectly across the tables.

Extract Example discussed in lecture class

	event_id integer	event_timestamp timestamp without time zone	event_date date	event_time time without time zone	event_duration interval
1	1	2024-03-13 10:30:00	2024-03-13	10:30:00	01:00:00
2	2	2024-03-14 15:45:00	2024-03-14	15:45:00	00:30:00
3	3	2024-03-15 08:00:00	2024-03-15	08:00:00	2 days 06:00:00

```
SELECT event_id,
       EXTRACT(YEAR FROM event_date) AS event_year,
       EXTRACT(MONTH FROM event_date) AS event_month,
       EXTRACT(DAY FROM event_date) AS event_day
FROM EventSchedule;
```

	event_id integer	event_year numeric	event_month numeric	event_day numeric
1	1	2024	3	13
2	2	2024	3	14
3	3	2024	3	15

```
SELECT
   EXTRACT(DAY FROM event_duration) AS days,
   EXTRACT(HOUR FROM event_duration) AS hours,
   EXTRACT(MINUTE FROM event_duration) AS minutes
FROM
EventSchedule;
```

days	hours	minutes
0	1	0
0	0	30
2	6	0