

DEMO Lab Exam 2a – 2025/2026

The Moodle Quiz provides you with TWO ATTEMPTS only. The overall duration of the quiz is unlimited. **You are strongly advised to make a note of your answers (number of rows or otherwise as specified per question) in the event of a loss of data or other incident.** Unless otherwise stated the Moodle Quiz will ask you to provide the number of rows affected by the corresponding query. Please read each question carefully!

CONTEXT: The file on Moodle called “**DEMO-LabExam2a-2025-2026-TABLE.sql**” will be used to automatically create a table called **DemoLabExam2aTable** which you will use to answer the questions below. The table represents a fictional dataset of automated credit card transactions in Cape Town, South Africa. **The data represents time periods in the year 2022 only (February to April, inclusive).**

- Column: **pkid** – the primary key
- Column: **clloc** – geometry (POINT) in EPSG:4326 as the location where the user used their mobile device to carry out the credit card transaction.
- Column: **amount** – an integer representing the amount of the transaction in South African rand (called Zar) currency.
- Column: **checksum** – a string representing a cross check for validation.
- Column: **cts** – the exact timestamp of the credit card transaction
- Column: **creditcard** – a string representing the user’s credit card number. All credit card numbers have the same number of digits.

Meter-based calculations: You are asked to use **EPSG:2055** which is officially called Hartebeesthoek94 / Lo33. This SRS is meter-based for South Africa.

As indicated in the lectures – some queries may affect the outcomes of others.

QUESTION 1: Some suspicious credit card activity has been detected and you are asked to **delete** rows from the table which have the following criteria – the **amount** is less than 150 Zar and the final digit in the **credit card number** is less than or equal to 5.

QUESTION 2: A shop within Cape Town Airport has Longitude 18.596978 and Latitude -33.968993. Consider all rows where the location (**clloc**) of the transactions are less than 5KM from this location. **Update** the amount in all rows to the exact value of 456 Zar where the **amount** is already greater than 400 or currently contains a NULL value.

QUESTION 3: Consider the credit cards such as 37428895048**0078** , 37428377533**0189**, and 37428333633**2088**. The last four digit characters (duplicates allowed) when considered or read as a four-digit number have a numerical value of less than 2,500. In these three examples, the numbers are 78, 189 and 2,088 (leading zeros are allowed).

Write an SQL query which will delete all rows from this table where the last four digits of the credit card number, when considered as a four digit number, has a numerical value of less than 2,500.

QUESTION 4: Update the table as follows. Set the **amount** column to NULL where the corresponding **checksum** ends with four alphabetical characters (no digits, repeated characters allowed) and the **amount** is less than 300 Zar.

QUESTION 5: Delete all rows (where the **amount** is NOT currently **null**) where the **ccts** timestamp indicates that the transactions occurred on or after 9am but before 9pm on any day in April.

QUESTION 6: Given the following **WKT POINT** (expressed in **EPSG:4326**) **POINT (18.57235 - 34.01127)**. **Update** the table by setting the **cloc** column equal to this point location where the **amount** currently is a NULL value and the **checksum** begins with any digit.

QUESTION 7: Given the **WKT** expressed **POINT** as **POINT(1337778.535 3861633.96)** which is already provided to you in **EPSG:2055**, write a query to **delete** all rows in the table where the geographic location in **cloc** is less than 2.5KM from this point.

QUESTION 8. For ANY day in the table, on or after 3 o'clock, in the afternoon, **delete** all rows where the credit card number has 5 or more consecutive digits between 2 and 7 (both inclusive). For example 3742830**722333**6331 or 3742830**2235235**331 are examples of these credit card numbers.