IFB105: Database Management

Tutorial 7 – Introduction to SQL

Before you start!

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Make sure you have installed MySQL Workbench on your computer!

Instructions can be found in blackboard!

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Part 1 – Week 7 Summary

Activity 1

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Q1. What is SQL? What can SQL do?

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Activity 1

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Q2. There are many versions of SQL with different syntaxes. However, they all share the same major commands. Can share some of those commands that are common across all SQL versions?

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Activity 1

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Q3. What are the main datatypes supported by MySQL?

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The Importance of Knowing Data Types: The Story of Ariane 5

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On 4 June 1996, the maiden flight of the Ariane 5 launcher ended in a failure.

Only about 40 seconds after initiation of the flight sequence, at an altitude of about 3700 m, the launcher veered off its flight path, broke up and exploded.

The failure of the Ariane 501 was caused by the complete loss of guidance and attitude information 37 seconds after start of the main engine ignition sequence (30 seconds after lift-off). This loss of information was due to specification and design errors in the software of the inertial reference system.

The internal SRI software exception was caused* ***during execution of a data conversion from 64-bit floating point to 16-bit signed integer value****.* ***The floating point number which was converted had a value greater than what could be represented by a 16-bit signed integer. This made Ariane 5 explode!***

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Activity 1

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Q4. Assign to each column its respective datatype in MySQL

StaffBranch (Not 3NF)

staffNo	name	position	salary	branchNo	branchAddress	telNo
S1500	Tom Daniels	Manager	46000	B001	8 Jefferson Way, Portland, OR 97201	503-555-3618
S0003	Sally Adams	Assistant	30000	B001	8 Jefferson Way, Portland, OR 97201	503-555-3618
S0010	Mary Martinez	Manager	50000	B002	City Center Plaza, Seattle, WA 98122	206-555-6756
S3250	Robert Chin	Supervisor	32000	B002	City Center Plaza, Seattle, WA 98122	206-555-6756
S2250	Sally Stern	Manager	48000	B004	16 – 14th Avenue, Seattle, WA 98128	206-555-3131
S0415	Art Peters	Manager	41000	B003	14 – 8th Avenue, New York, NY 10012	212-371-3000

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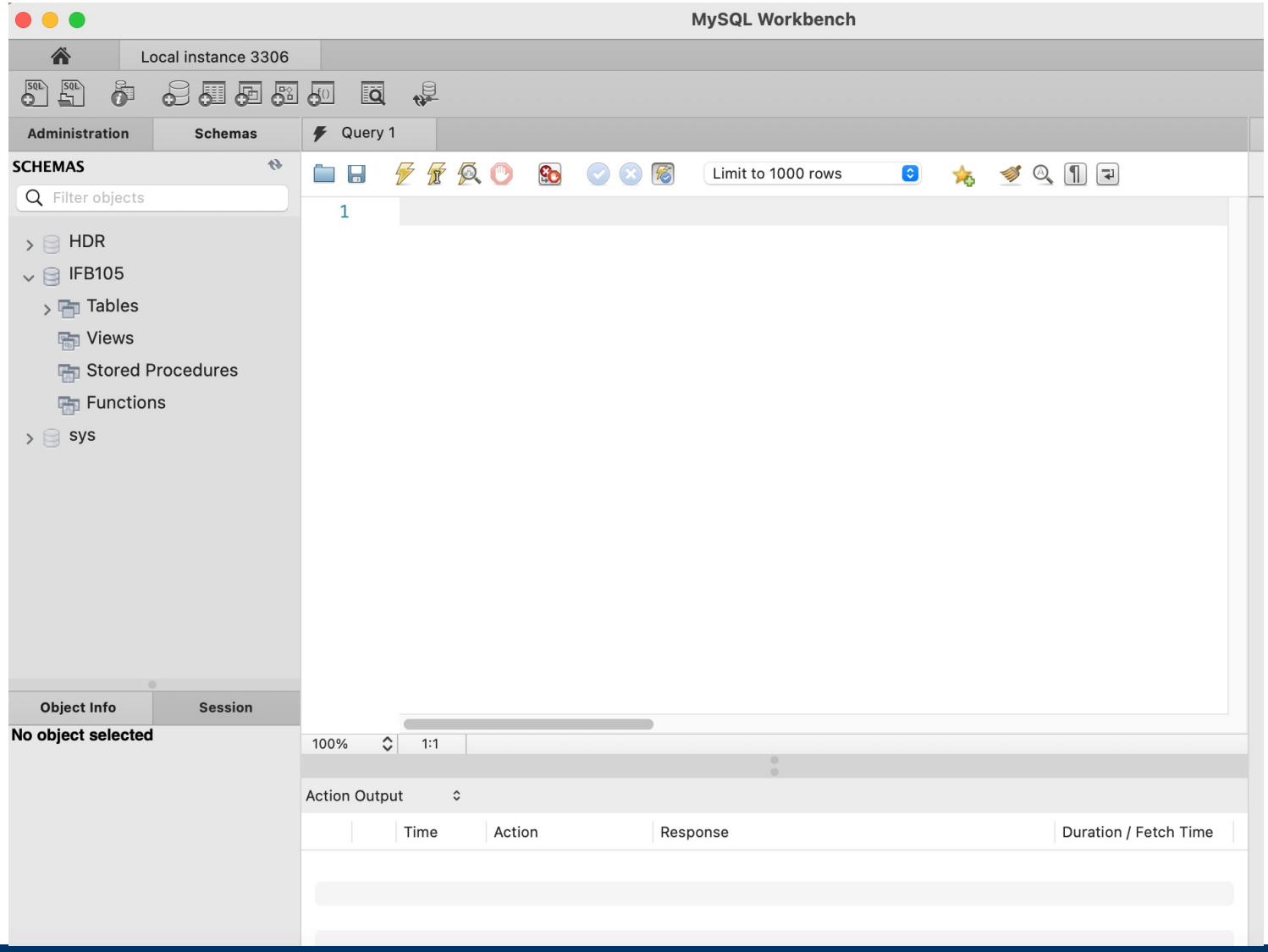
Activity 1

General Overview of MySQL Workbench



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Part 2 – SQL

Before you start!

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Download and Load into MySQL Workbench the DREAMHOME DB

Blackboard > Learning Materials > Week 7 > Tutorial > Database

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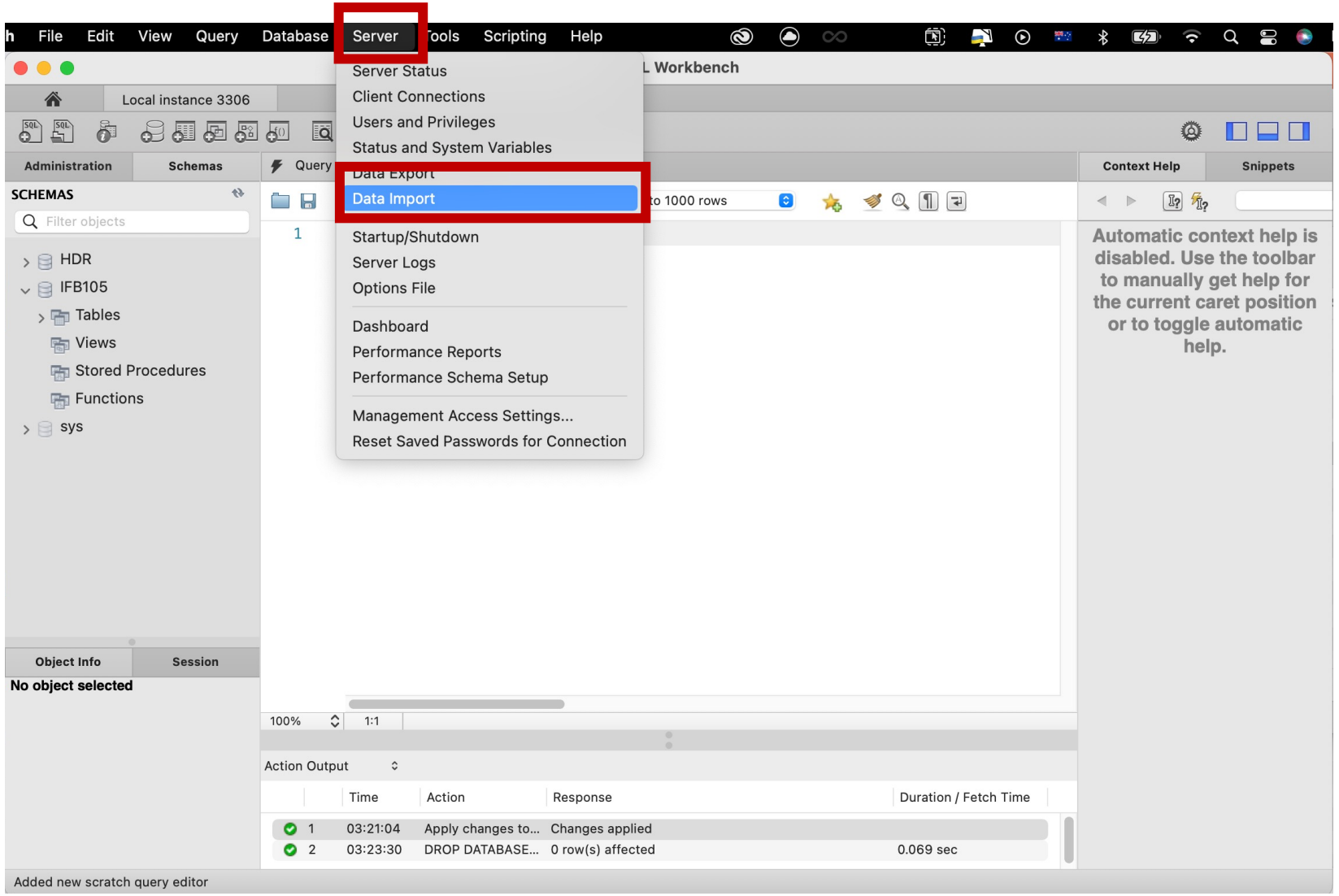
Before you start!

Queensland University of Technology



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Before you start!

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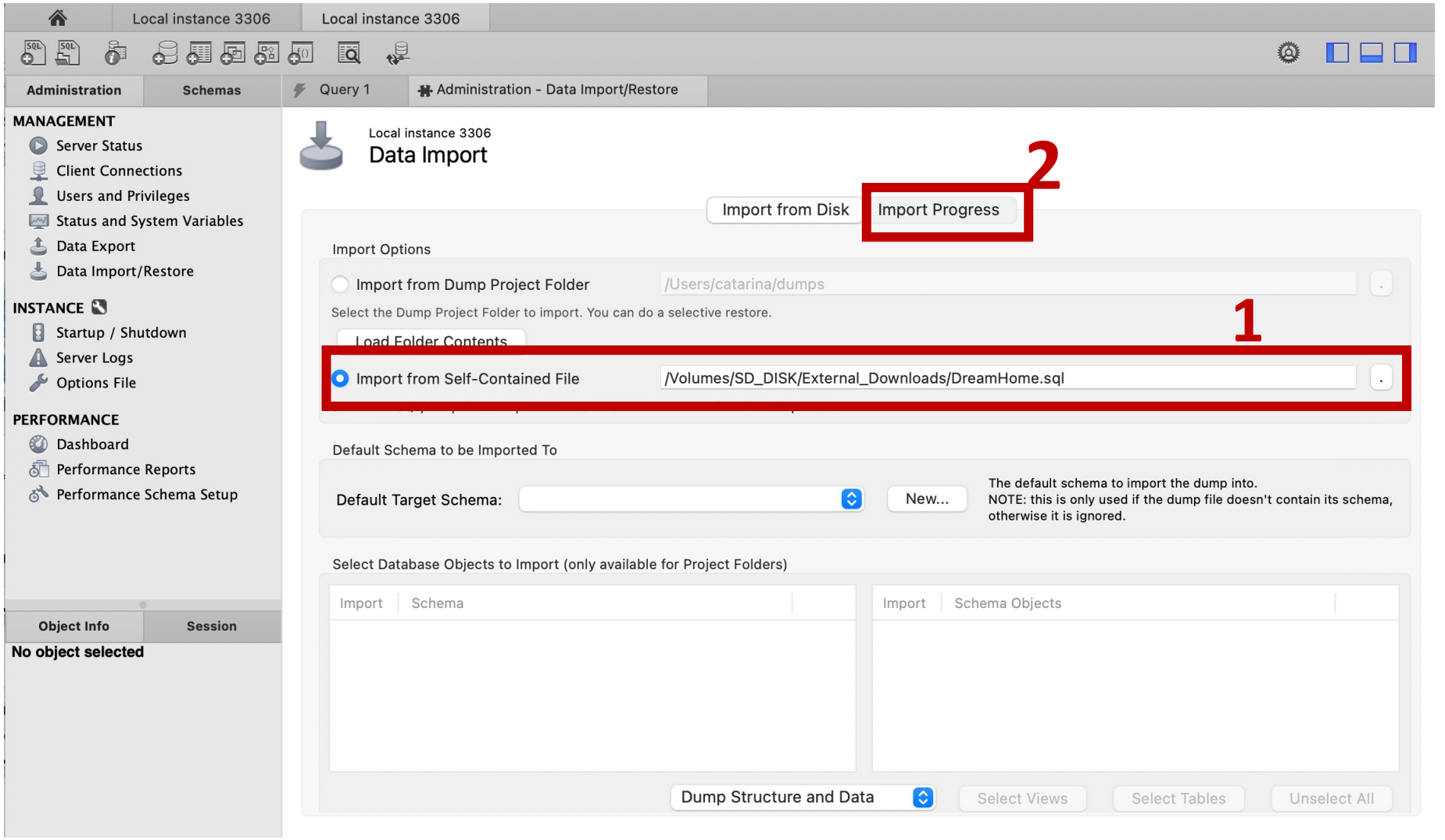

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Before you start!

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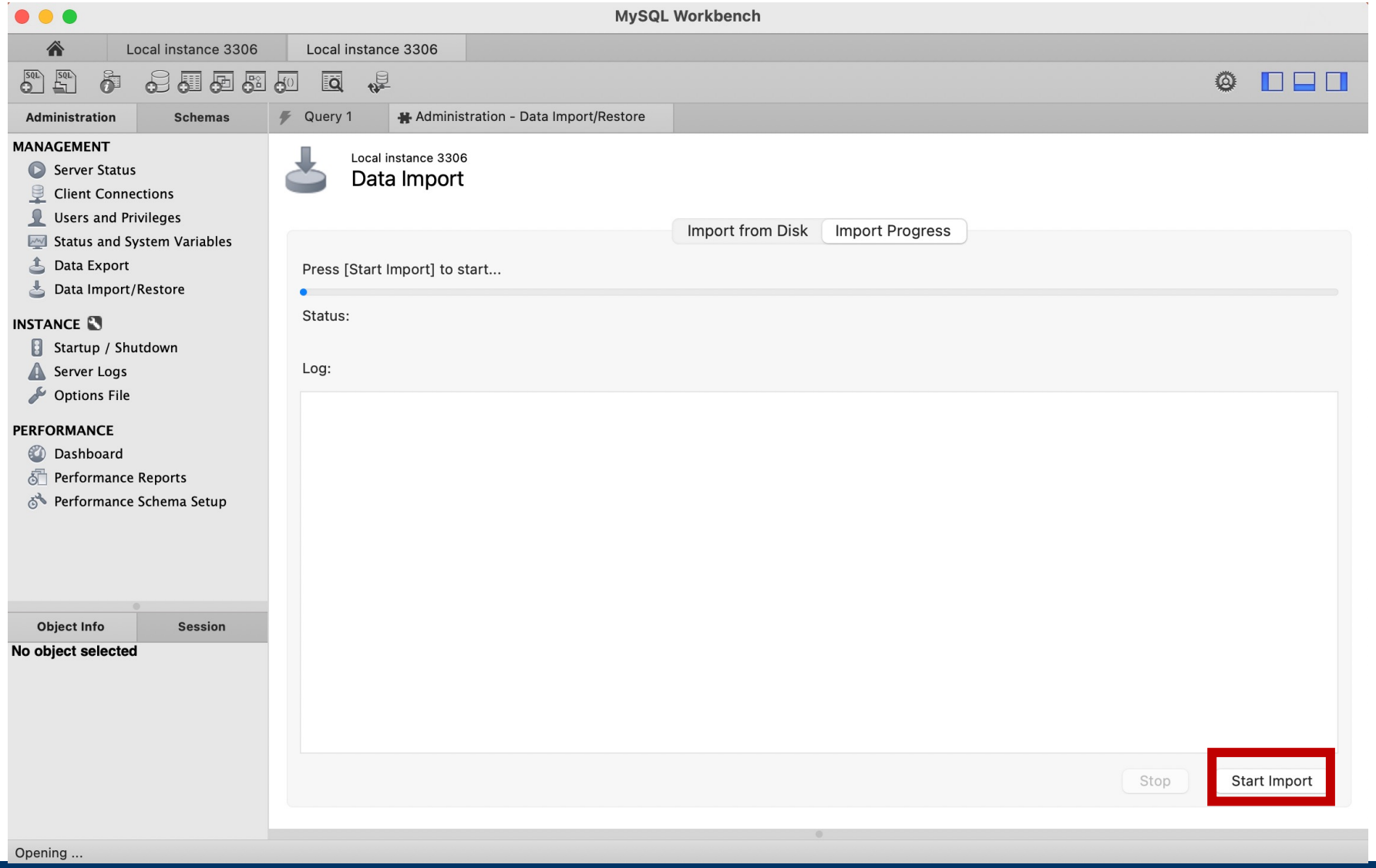

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Before you start!

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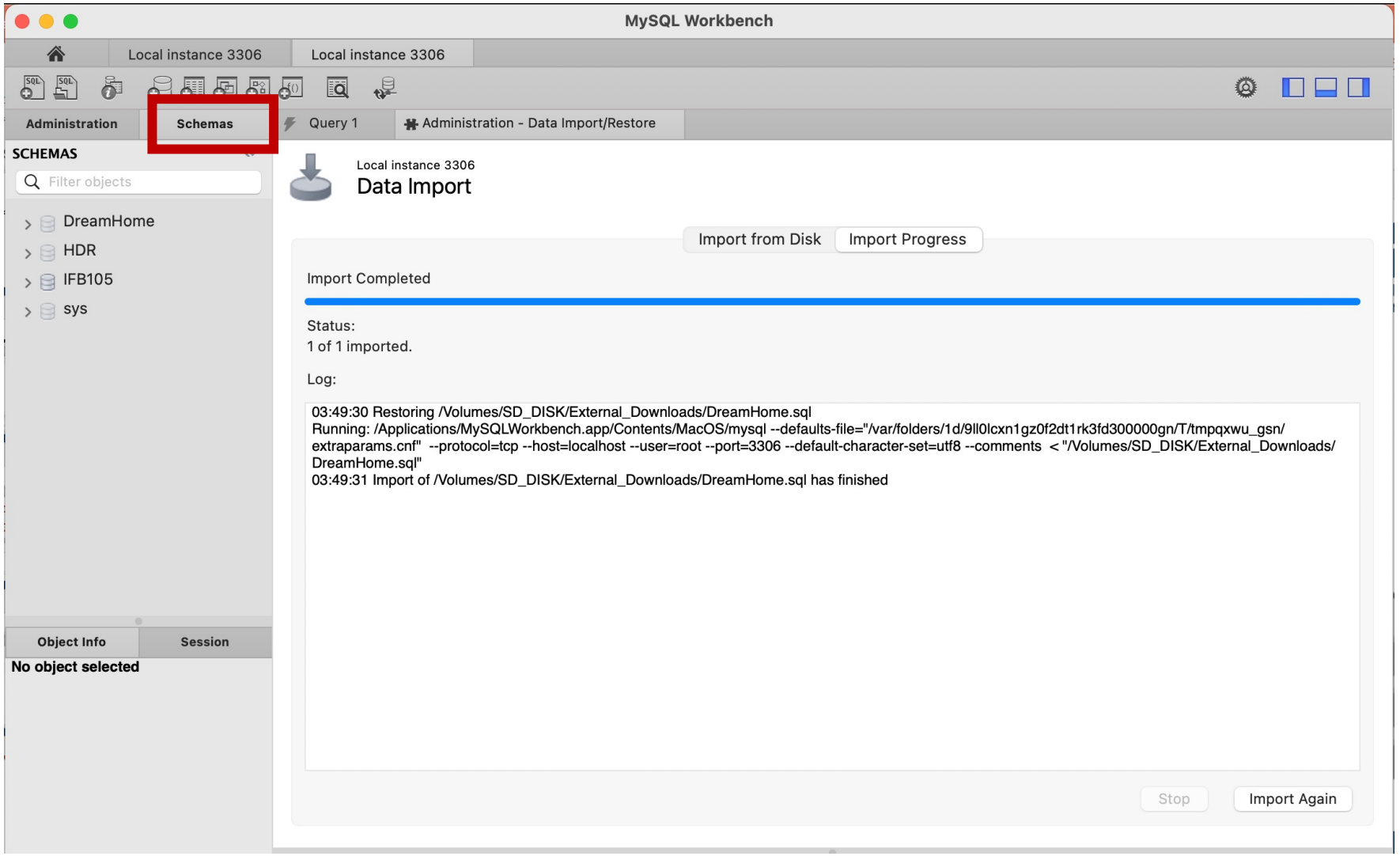

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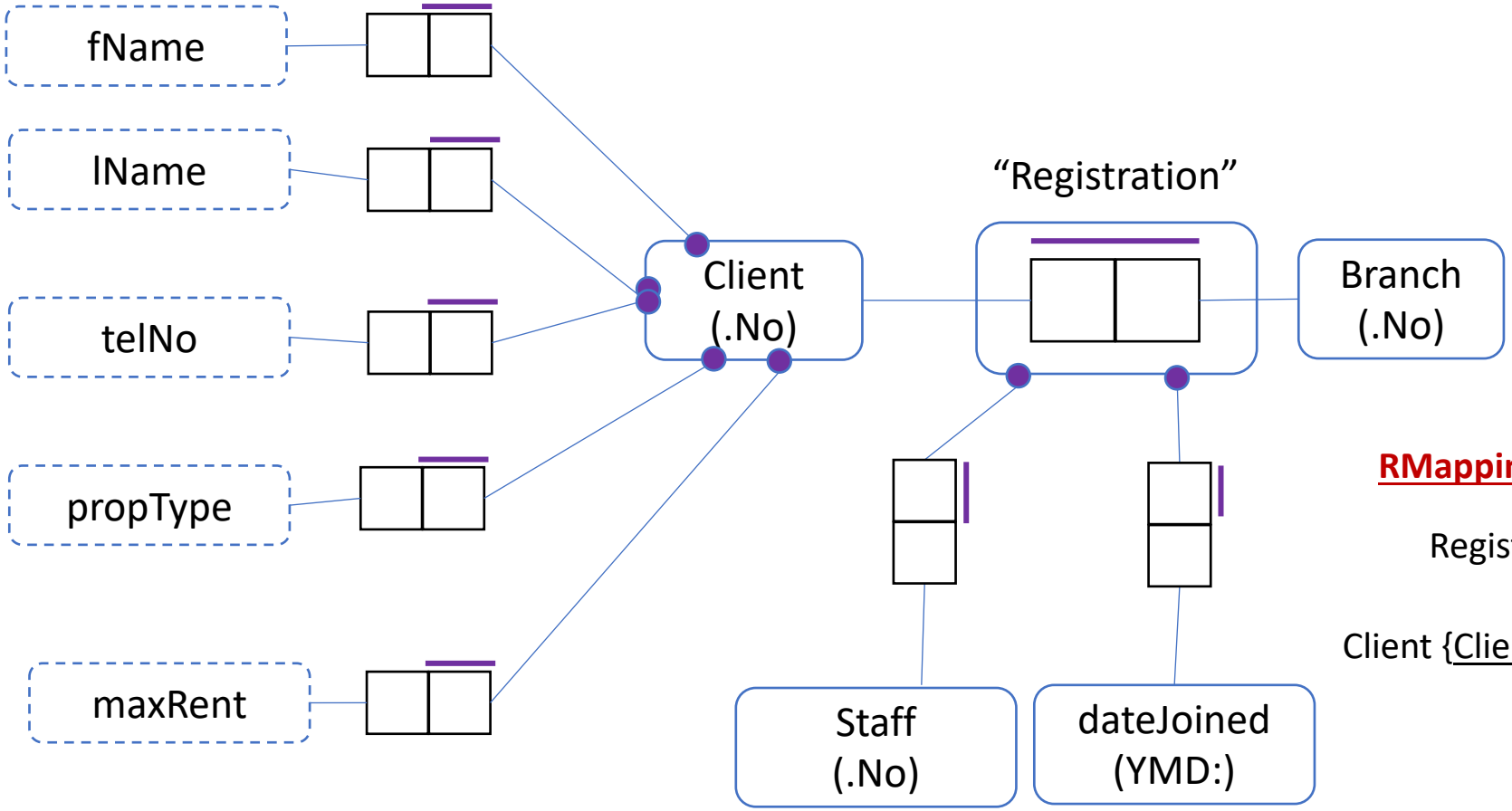
Task 1

Consider the following ORM diagram and respective Rmapping .



RMapping

Registration {ClientNo, branchNo, StaffNo, dateJoined}

Client {ClientNo, fname, lname, telNo, propType, maxRent}

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Task 1

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Load the DreamHome DB to your DBMS.
Using the ORM diagram and Rmapping from the previous slide answer the following questions.

Q1. Identify tables and table names (relations).

Q2. Identify columns and their data types (attributes and domains)

Q3. Identify constraints (NOT NULL, Primary key, Foreign Keys).

Registration

clientNo	branchNo	staffNo	dateJoined
CR76	B005	SL41	2004-04-02
CR56	B003	SG37	2004-04-11
CR74	B003	SG37	2004-11-16
CR62	B007	SA9	2004-03-07

Client

clientNo	fname	lname	telNo	preType	maxRent
CR56	Aline	Stewart	0141-848-1825	Flat	350
CR62	Mary	Tregear	0224-196720	Flat	600
CR74	Mike	Ritchie	01475-392178	House	750
CR76	John	Kay	0207-774-5632	Flat	425

Note:

- Registration:
  . The combination of clientNo and branchNo is the primary key of Registration table.
  . There are three foreign keys: Client (clientNo), Staff (staffNo), Branch (branchNo)
  ** Branch and Staff tables already exist in the DreamHome database.*

- Client:
  . clientNo is the primary key.
  . maxRent in table is a decimal type.

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Task 2

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Using the ORM diagram and Rmapping from Task 1, create the tables Client and Registration

MySQL Create table documentation: https://dev.mysql.com/doc/refman/8.0/en/create-table.html

CREATE TABLE *TableName* (

ColumnName1 DataType [Constraints…],

ColumnName2 DataType [Constraints…],

[…]

primary key (*ColumnName1, …*),

foreign key (*ColumnName*) references *Referenced_TableName* (*ColumnName*)
);

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Task 3

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Insert the following data into their respective tables

MySQL INSERT documentation: https://dev.mysql.com/doc/refman/8.0/en/insert.html

Registration

clientNo	branchNo	staffNo	dateJoined
CR76	B005	SL41	2004-04-02
CR56	B003	SG37	2004-04-11
CR74	B003	SG37	2004-11-16
CR62	B007	SA9	2004-03-07

Client

clientNo	fname	lname	telNo	preType	maxRent
CR56	Aline	Stewart	0141-848-1825	Flat	350
CR62	Mary	Tregear	0224-196720	Flat	600
CR74	Mike	Ritchie	01475-392178	House	750
CR76	John	Kay	0207-774-5632	Flat	425

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Task 4

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Visualise the data that you just inserted using a SELECT statement

MySQL SELECT documentation: https://dev.mysql.com/doc/refman/8.0/en/select.html

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Task 5

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[1] Create a table Visitor that has the following information:

- firstName (mandatory)
- lastName (mandatory)
- age (optional)

[2] Add the following visitors to your table:

- Mary Jane, 21 years;
- Peter Parker, 19 years;
- Tony Stark, ? years;

[3] Check the contents of the table

What should be the Primary Key in this scenario? (Hint: check the AUTO_INCREMENT method presented in the lectures)

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Task 6

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Consider the Visitor table that you just created.

[1] Update the age of Tony Starks to 44 years.

[2] Delete all information about "Mary Jane"

UPDATE documentation: https://dev.mysql.com/doc/refman/8.0/en/update.html
DELETE documentation: https://dev.mysql.com/doc/refman/8.0/en/delete.html

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Task 7

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Back to the DreamHome DB.
Add a new column (age, INT type) to Client table.

MySQL ALTER TABLE documentation: https://dev.mysql.com/doc/refman/8.0/en/alter-table.html

- **To add a new column to a table**:

ALTER TABLE table_name ADD new column_name datatype

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Task 8

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Rename the name of Client table to Client_old.

MySQL ALTER TABLE documentation: https://dev.mysql.com/doc/refman/8.0/en/alter-table.html

- **To rename the name of table**:

ALTER TABLE table_name RENAME TO new table_name

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Task 9

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Delete table “Client_old” and then table “Registration”. What happened?

MySQL DROP TABLE documentation: https://dev.mysql.com/doc/refman/8.0/en/drop-table.html

```
DROP TABLE table_name [RESTRICT | CASCADE];
```

- **Restrict option**: To prevent the parent table from being deleted if any other tables refer to it (foreign key).
- **Cascade option**: To always delete the parent table together with all the tables where they are referred (foreign key

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Task 10

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Delete table “Registration” and then “Client_old”.

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Part 3 – Assessment Project