

Lab Six: Advanced Databases

At the end of this lab, you should have:

- practiced the design and use of **JOIN** clauses to join together tables;
- practiced the design and use of views to create shortcuts to viewing data;
- practiced the modelling and use of spatial data in a MySQL system;
- revised any outstanding relational database content.

You should also have answered the relevant questions at the end of the lab sheet. The above statements are the *learning outcomes* of this laboratory and will be achieved in concert with the other learning activities that you undertake for this unit.

Task One: Preparing and Joining Together Data

1. Add a new row to the **TransactionItem** table as shown below:

id	description	quantity	unitPrice	hasGst
5	Improved Widget	3	9.99	True (1)

2. Create and execute queries to join the **TransactionItem** table on to the **Transaction** table (with the latter as the 'first') on the **id / transactionItem**:
 - a. Rows that exist in both tables;
 - b. Rows that exist only within the **TransactionItem** table;
 - c. Rows that exist only within the **Transaction** table.

Task Two: Views on Data

3. Create three views on the database table, named and containing the content as stated below. After each time you have created the view, confirm the query used to create it:
 - a. A view named **TransactionsWithItems** which contains the **Transaction** and **TransactionItem** tables joined on common (matching) rows;
 - b. A view named **GstOnlyItems** which contains only **TransactionItem** rows (observations) that contain GST;
 - c. A view named **JanuaryTransactions** which contains only **Transaction** rows (observations) that are dated within January.

Task Three: Spatial Data and Databases

4. Create a new table (using appropriate values for data types and modifiers) named **Locations** that contains the following data, where the latitude and longitude of each place is stored as a **POINT** in a column named **geometry**:

id	name	longitude	latitude
1	Perth	115.850	-31.950
2	Joondalup	115.766	-31.745
3	Mandurah	115.723	-32.523
4	Armadale	116.015	-32.153

5. Write and execute a query that will return all rows from the `Locations` table that are located within forty kilometres of Crawley – located at -31.986 (S), 115.822 (E) – ensuring that the geometric data is displayed in a human-readable format.

Task Four: Revision

6. If there is any remaining time in the laboratory, please use it to finish off any work you have missed from previous labs, revise any content you wish to look at again or get any questions answered by your tutor.

This is the last practical on relational databases – while questions will happily be entertained into the future, you may wish to use this as an opportunity (ahead of the assessment) to ensure you have any questions answered that you wish to have answered.

End of activities. Please see the next page for the questions you may wish to answer.

Questions

Ensure you can answer these questions to cement your understanding of the lab.

1. Record down the three types of **JOINS** taught and utilised within this unit:
2. Record down the command format used for the following operations with **VIEWS**:

Create a View:

'Read' a View:

Update a View:

Delete a View:
3. Record down (in your script file) the commands for the rest of the practical.

End of Lab Six.