Assignment 14: SQL Queries

(60 Points Total, 4 Points per question, 2 Points for SQL, 2 Points for answer)

Data available under Resources>Portland Data.

The portland_data.gpkg GeoPackage contains three data layers for Portland, Oregon:

- **neighborhoods**: boundaries of Portland neighborhoods
- **park_trees**: mapped trees in parks
- **street_trees**: mapped trees along streets

The neighborhood boundaries were obtained from the City of Portland [https://www.portlandoregon.gov/28130](https://www.portlandoregon.gov/28130) while the tree inventory data were obtained from the City of Portland Office of Parks & Recreation [https://www.portlandoregon.gov/parks/article/433143](https://www.portlandoregon.gov/parks/article/433143).

Use these data and the DB Manager within QGIS to answer the following questions. For each question, you will need to provide your answer and the SQL code you used to obtain it.

**Questions**

1. How many different genera are present in the park_trees dataset (Hint: Use "Genus" attribute)?
2. Which genus has the largest number of trees in the park_trees dataset (Hint: Use "Genus" attribute)?
3. How many genera have more than 200 trees present in the park_trees dataset (Hint: Use "Genus" attribute)?
4. How many trees in the park_trees dataset have a DBH larger than 45 and are in the Quercus genus (Hint: Use "DBH" and "Genus" attributes)?
5. How many different species are present in the Acer genus in the park_trees dataset (Hint: Use the "Genus" and "Genus_spec" attributes)?
6. How many trees in the park_trees dataset are in the Acer genus and in Poor condition? (Hint: Use the "Genus" and "Condition" attributes)?
7. Which species in the Acer genus has the highest average DBH for all trees of that species present in the park_trees dataset (Hint: Use the "Genus", "Genus_spec", and "DBH" attributes)?
8. How many trees in the park_trees dataset have a height between 50 and 80 (Hint: Use the "TreeHeight" attribute)?
9. How many trees in the park_trees dataset have a height between 50 and 80, a DBH larger than 30, and are in the Ulmus genus (Hint: Use the "TreeHeight", "DBH", and "Genus" attributes)?
10. How many trees in the park_trees dataset are in Fair Condition and are in the Betula or Pinaceae genus (Hint: Use the "TreeHeight", "DBH", and "Genus" attributes)?

11. Which neighborhood (as identified by the "NAME" attribute) has the largest number of trees in the park_trees dataset (Hint: use a spatial query)?

12. Which neighborhood (as identified by the "NAME" attribute) has the largest number of trees in the park_trees dataset that are of the genus Acer (Hint: use a spatial query and the "Genus" attribute)?

13. How many trees from the park_trees data set are within 50 meters of the centroid of any neighborhood (Hint: use a spatial query)?

14. Which neighborhoods touch or share a boundary with the 'VERNON' neighborhood (Hint: use a spatial query and the "NAME" attribute)?

15. How many neighborhoods have a portion of their land area within 2 kilometers of the 'VERNON' neighborhood (Hint: use a spatial query and the "NAME" attribute)?

**Deliverables**

Plain text document with answers to each question along with the SQL syntax used.