CIDM/ECON 6308 Data Analytics HW2

(60 points in total; Due 11:59pm CST, February 19, 2023)

DSB Chapter 2 (pp.35-38) mentions a few analytics techniques such as Statistics and Database querying. HW2 is designed to refresh and sharpen your Statistics and SQL querying skills. SQL is one of important technical skills that managers are recommended to own because almost every organization has database. You do not need to be a master of SQL, but you need to know the basic format and clauses of SQL queries.
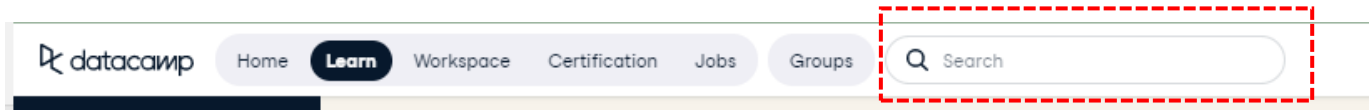
Learning objectives

- Understanding different types of data
- Understanding different data collection methods
- Sharpening your SQL querying skills by practicing
- Retrieving required information by database querying
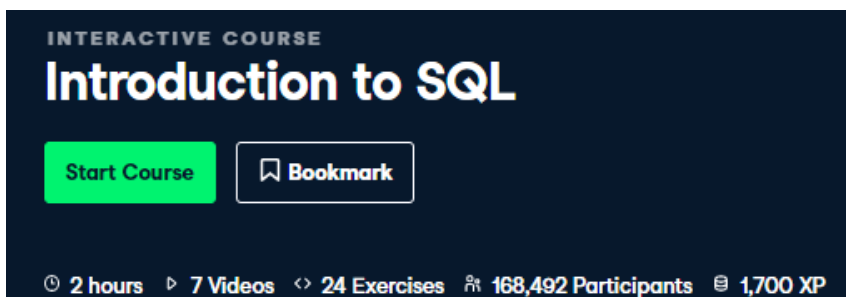
Instructions

This individual homework assignment includes two parts. Part 1 requires you to complete a 4-hour course on DataCamp and Part 2 asks you to practice SQL on W3Schools. In order to help you check your queries in Part 2, I design at least one question for each query so that you can check your performance by answering those questions via HW2-Query (20 points in total) and then decide if you want to resubmit your answers. You have two attempts in total and the higher one will be counted into your grade. In addition, please compile the screenshot of your Statement of Accomplishment) in Part 1 and screenshots of your query and results for five questions in Part 2 via HW2-Screenshot (40 points).

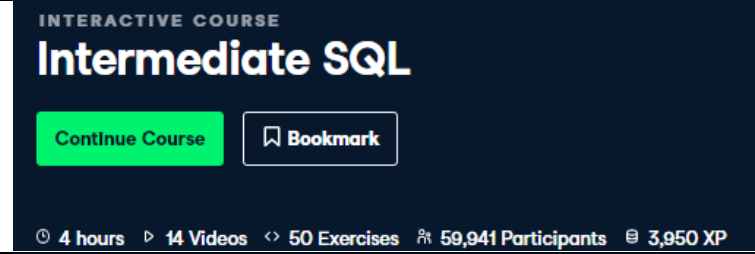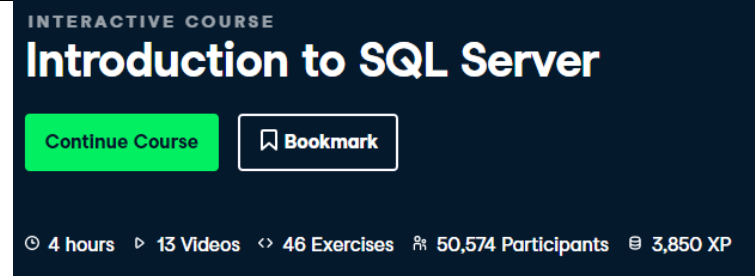**Part 1: Completing An Interactive Course on DataCamp (20 points)**
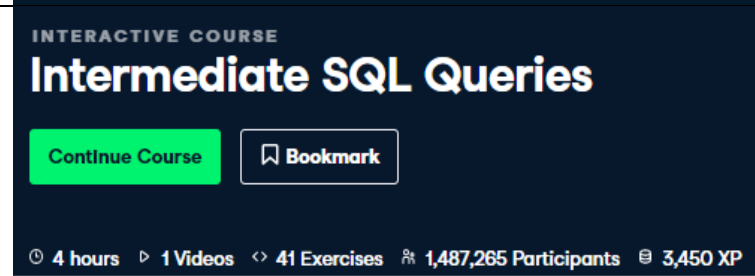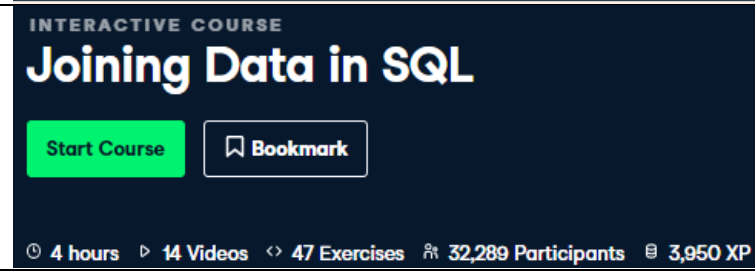Instruction: please type the course name in the search box and then choose the appropriate course and then take it.

[Optional] If this is your first time to use SQL, please first finish the following course, Introduction to SQL, which includes two chapters: Relational Databases and Querying, and then start the required course. If you have already used SQL before, you can skip this course.

[Required] Please take **one** of the following four courses.

Course	Chapters
INTERACTIVE COURSE **Intermediate SQL** Continue Course · Bookmark 4 hours · 14 Videos · 50 Exercises · 59,941 Participants · 3,950 XP	• Selecting columns • Filtering rows • Aggregate Functions • Sorting and grouping
INTERACTIVE COURSE **Introduction to SQL Server** Continue Course · Bookmark 4 hours · 13 Videos · 46 Exercises · 50,574 Participants · 3,850 XP	• SELECTion Box • Groups, strings, and counting things • Joining tables • You've got the power
INTERACTIVE COURSE **Intermediate SQL Queries** Continue Course · Bookmark 4 hours · 1 Videos · 41 Exercises · 1,487,265 Participants · 3,450 XP	• Selecting columns • Filtering rows • Aggregate Functions • Sorting and grouping
INTERACTIVE COURSE **Joining Data in SQL** Start Course · Bookmark 4 hours · 14 Videos · 47 Exercises · 32,289 Participants · 3,950 XP	• Introducing Inner Joins • Outer Joins, Cross Joins and Self Joins • Set Theory for SQL Joins • Subqueries

After completing the course you select, you will receive **Statement of Accomplishment** (you should receive a copy in your email as well). Please take a screenshot of it to show your completion to earn 20 points. If you do not know how to take a screenshot, please check this website: https://www.take-a-screenshot.org/. Your screenshot must meet the **three requirements** below.

The name here must be matched with your name on WTClass (if not please explain); otherwise, a zero point will be assigned.

The course name here must one of the four required ones; otherwise, a zero point will be assigned.

The date here must be between February 9 and 20, 2023; otherwise, a zero point will be assigned.

Part 2: SQL Database Querying (40 points: 20 points for your answers based on your queries and 20 points for your screenshots)

The following 15 queries will help you achieve this goal. Please complete all the 15 queries on W3Schools using this following link (Attention: Please use **Google Chrome** as your browser to avoid some technical malfunction or incompatibility): https://www.w3schools.com/sql/trysql.asp?filename=trysql_select_all

Instructions:

- Please use the file <u>Northwind Database.pdf</u> to get familiar with the structure of this database.
- Check whether your database on W3School is the same as the one in the right (each of your tables has the exactly same number of records as this picture shows), especially if you have used W3Schools database in your previous class. If yes, please go ahead to use it; otherwise, please click Restore Database to restore yours.
- In order to achieve a better learning performance, please understand those clauses and all the queries in the file <u>SQL lab Tutorial.pdf</u>. Then, type each of them by your own, rather than simply copy and paste the query directly from Lab Tutorial (sometimes, it may not work due to format issue). If you do not know what each statement means, please refer to https://www.w3schools.com/sql/default.asp and practice each of them before you work on your homework.
- Read each question carefully. Write your query and then run it on w3schools. Based on your results, please answer all the questions corresponding to each query via HW2-Query Submission Page.
- Five questions require you to <u>take a screenshot of your query and the result table</u> (if the result table has too many rows, please make sure your screenshot shows both your query and the very top of your result; if a query is too long, you are allowed to take up to two screenshots to show your query). Each of your screenshots must include date and time, as indicated in the next page.

Your Database:

Tablename	Records
Customers	91
Categories	8
Employees	10
OrderDetails	518
Orders	196
Products	77
Shippers	3
Suppliers	29

Restore Database

The number of results you get after you run your query

Date and Time for Windows Users

Date and Time for MAC users

In order to receive full points, you must follow the instruction, **answer all the questions** and provide all the required **screenshots** (screenshots from five questions in total) with **date and time (see the example above)**.

Grading Rubrics for Screenshots:

Each screenshot is worth 4 points, please check if your screenshots and queries meet the requirements:

- Each screenshot must show date and time; otherwise, deduct 3 points.
- The date and time in each screenshot must be between February 9 and 20, 2022; otherwise, deduct 4 points.
- Each screenshot must show the result or the top of the result table; otherwise, deduct 2 points.
- Each query must use clauses required by each question such as using JOIN ON; otherwise, deduct 2 points for each missing or wrong clause.
- If you use a wrong SELECT statement (e.g., adding or missing an attribute), deduct 2 points.
- If you miss a screenshot, deduct 4 points.

The minimum point on each screenshot is zero. However, if identical screenshots are found from two or more students, a zero point will be assigned to all the involved students and such a case will be reported to the PEV COB Dean's office.

Here is the general format for an SQL SELECT statement:

SELECT column1, column2
FROM table1
[JOIN table2 ON table1.fieldq = table2.fieldr]   ……… ……… add this as needed
[JOIN table3 ON table2.fieldx = table3.fieldy] etc.   ……… ……… add this as needed
[WHERE "conditions"]   ……… ……… add this as needed
[GROUP BY "column-list"]   ……… ……… add this as needed
[HAVING "conditions"]   ……… ……… add this as needed
[ORDER BY "column-list" [ASC | DESC]]   ……… ……… add this as needed

Please complete the following 15 queries and answer all the required questions on HW2-Query: You may find the first 13 queries (or similar) in our SQL Lab Tutorial.

1. Write a query to show first names and last names of employees from the Employees table in the database. After you run your query, how many records do you get?

2. Write a query to pull all of the attributes from the Employees table. After you run your query, how many attributes do you get?

3. Write a query to show CustomerName and ContactName in the city of London from the Customers table. After you run your query, how many records do you get?

4. Write a query to find the average price for each supplier from the Products table. What is the highest average price in your result (round to two decimal places as needed)?

5. Write a query to find the number of suppliers with an average price greater than $28 in the Products table. How many suppliers in your result table?

6. Write a query to find the suppliers with an average price greater than $25 with supplierIDs greater than 5 (Sort SupplierIDs in ascending order). Run your query and answer the following questions:
    a. How many records do you get?
    b. What is the average price of the first record in your result (round to two decimal places as needed)?

7. Write a query to pull all the attributes of the product with product ID greater than 6, categoryID equal to 5, and price greater than 8 from the Products table. Run your query and answer the following questions:
    a. How many records do you get?
    b. Which product has the highest price in your result table? Type the product ID here.

8. Write a query to show SupplierID and SupplierName of suppliers with 1) SupplierID greater than 2 but smaller than 10 or 2) country equal to USA [Use WHERE OR] [Screenshot 1 with date and time]. Please indicate the number of records you get after you run your query.

9. Write a query to show supplierID and SupplierName of suppliers with SupplierID equal to 22, 25, 28, **or** 32 from the Suppliers table (please use WHERE OR). Please indicate the number of records you get after you run your query.

10. Write a query to show SupplierID and SupplierName of suppliers with SupplierID equal to 3, 13, 23, **or** 33. (Please use WHERE IN). [Screenshot 2 with date and time] Please indicate the number of records you get after you run your query.

11. Write a query to show SupplierID and SupplierName of suppliers with SupplierID greater than 12 but smaller than 30. Use WHERE BETWEEN AND. Hint: Please note that the clause between X and Y includes both X and Y, so you have to change it to between X+1 and Y-1 to satisfy the requirement]. How many records do you get after you run your query?

12. Write a query to pull the CustomerName, City, and PostalCode of all the customers' cities that start with "S" **and** postal codes that start with "9". After running your query, how many records do you get?

13. Write a query to show a list of OrderIDs and which employees (including their last name and first name) processed each order (organized alphabetically by employee last name). Use Where statement in this query [Screenshot 3 with date and time]. Please indicate the number of records you get after you run your query.

14. Write a query to show a list of OrderIDs and which shipper shipped each order (organized alphabetically by ShipperName). Use JOIN ON Statement in this query [Screenshot 4 with date and time]. Please answer the following questions:
    a. Take a look at the structure of the database, and then you will find that your query involves two tables. One of them is the Orders table, what is the other one? Type the table name there.
    b. Which attribute is used to connect the two tables? Please type the attribute name here (please do not include the table name in your answer).
    c. How many records do you get after you run your query?

15. Write a query to show a list of ProductID, ProductName, their category names and supplier's name (organized by product ID at an ascending order). Please use JOIN ON Statement [Screenshot 5 with date and time]. Please answer the following questions:
    a. Take a look at the structure of the database, and then you will find that your query should involve three tables: One of them is Products, what are the other two? Type their names, separated by a comma and space (e.g., Orders, Employees).
    b. How many records do you get after running your query?