Discussion IST769 Unit A - Introduction

## Agenda

1. Your Questions
2. DB/SQL Review

FRONT MATTER:

* Azure Labs invite: <https://labs.azure.com/register/qlgn13k5>   
  OR  
  Did you install docker as per instructions: <https://github.com/mafudge/advanced-databases>
* Code Share: <https://codeshare.io/eVXbOJ>
* Azure Data Studio: <https://learn.microsoft.com/en-us/azure-data-studio/download-azure-data-studio#download-azure-data-studio>
* RUN MSSQL DATABASE

Open terminal

Type: **cd advanced-databases**

Type: **docker-compose up mssql**

(You should see logs)

* CONNECT TO DATABASE

Open Azure Data Studio

Click on connections (top left)

Click new Connection (first one next to servers)

In the connection Panel:

Server: **localhost**

Authentication Type: **sql Login**

User Name: **sa**

Password: **SU2orange!**

Click Connect

Trust Server Cert

QUERY:

CTRL + N

* LOAD NORTHWIND DATABASE Scripts:

CTRL + O  
Select **datasets/northwind/mssql/up-0-create-database.sql**

|> Run (F5 key)

CTRL + O  
Select **datasets/northwind/mssql/up-1-schema-and-data.sql**

|> Run (F5 key)

## 1. Your Questions

Ask your questions here

* Can you go over clustered/non-clustered index?
* Can explain how does the index work and why default most of the query in azure data studio are in clustered index scan not in seek .
* What is the difference between ‘docker compose’ and ‘docker-compose’ command?
* Can the course video be played at 1.5x or 2x?
* When I use ‘JOIN’, Index search/seek is used, but when i used ‘LEFT JOIN’ It uses cluster index search/seek instead, can you explain why?
* ???

## 2. Relational Database/SQL Review

**SQL Operations**

1. Order the steps of this SELECT statement, first to last
2. What is a map?
3. Which operation performs a map?
4. What is a reduce?
5. Which operation performs a reduce?

**Advanced SQL**

1. What problem does an SQL common table expression solve?
2. What problem does an SQL window function solve?

**Database Indexing and Query Plans**

1. What is a query plan?

How the query actually gets executed

1. What is an index?
2. What is the difference between a clustered and non-clustered index?
3. How do you know when an index is being used?
4. What is the difference between a scan and a seek?
5. SELECT c, sum(g) FROM x GROUP BY c  
   SELECT a,b FROM x WHERE c=7  
   Write one index to cover both queries.

**CREATE INDEX ix\_somthing ON x**

**(c)**

**INCLUDE (a,b,g)**

**Database Transactions**

1. What is a database transaction?
2. What is Atomicity?
3. What is Consistency?
4. What is Isolation?
5. What is Durability?
6. What is a Rollback?