Logo

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**Relational & NOSQL Databases**

Graphical user interface, application

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**name:**

**course:**

**date:**

**Tutor Name:**

**SQL Server - TSQL Queries to support:**

**[insert database name]**

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**Advice from Module Leader for SQL Practitioner:**

*Delete instructions from your submitted document.*

*“The* ***2023 ICA SQL Template*** *to support you developing your own* ***Portfolio*** *to support Employability. You can also present your TSQL code and this document* *at* [***ExpoTalent 2023***](https://www.tees.ac.uk/schools/scedt/expotees/expotalent.cfm)*event. A* [***Developer Portfolio***](https://skilledev.com/software-developer-portfolio-examples/) *is important if you wish to demonstrate your work of excellence to Industry. Your assessment work is your ‘work experience’ for Employability.” Mansha Nawaz*

*I also recommend you use your works of excellence to support your CV or covering letter:*

**CV: SQL Server: Currently developing a range of T-SQL Queries for a worlds Movie Database to support the Business Functions for the likes of IMDb and Netflix ‘.**

**Covering letter or Interview Blurb: “I enjoyed working with a real database used by the likes of IMDb. It was challenging but can demonstrate a range of TSQL skills like presenting top 10 Movies or Actors based on the various categories or rankings. It is/was a bit of a challenge to categories movies in terms of their revenue in terms of percentage of overall total movie earnings for each category. Is it worth investing in Comedy or Action. Do romantic comedies earn more? Its all interesting and has me interested in also pursuing Data Science. I am more than happy to show you my SQL Server portfolio 😉.**

**Your** [**Developer Portfolio**](https://skilledev.com/software-developer-portfolio-examples/) **becomes your evidence and work experience!**

**Instructions for SQL Practitioner:**

**As a SQL Server practitioner you are to investigate new TU 2022 SQL Server Database Samples to provide a range of useful TSQL Demos to:**

1. Provide a useful insight into **ONE** of the new Database of your choice
2. We prefer you stick to one Database for Demo’s but have no issues if you decide on flipping across to others.
3. Present a set of TSQL Demos to support useful **Business Functions** [**User Requirements** or **User Stories]**
4. Provide a set of TSQL Demos - Queries and scripts supporting the User
5. Develop your TSQL skills as a practitioner and present your TSQL Portfolio of work

Document your best **TSQL Demos** from your supporting **.sql files**.

Utilise any format for your report - Word, Publisher, PowerPoints or hybrid document with mini videos or gifs. Consider embedding mini videos of you demonstrating your code as industry consider this exemplary skill (they prefer a simple normal unscripted audio in)

**How to write Business Functions to support the TSQL Queries you develop?**

Keep it simple and note we are only interested in obtaining desired data to support Business Functions. Provide supporting Business Function as simple User Stories or Requirements. See generic google search [User Story Examples](https://uk.search.yahoo.com/search;_ylt=Awr.htYFjV5jJUcoK1AM34lQ;_ylc=X1MDMTM1MTIxMjgxMgRfcgMyBGZyA21jYWZlZQRmcjIDc2ItdG9wBGdwcmlkAzFIb296SWszUnpxRGJBeEJFY1ROckEEbl9yc2x0AzAEbl9zdWdnAzEwBG9yaWdpbgN1ay5zZWFyY2gueWFob28uY29tBHBvcwMwBHBxc3RyAwRwcXN0cmwDMARxc3RybAMxOQRxdWVyeQN1c2VyJTIwc3RvcnklMjBleGFtcGxlcwR0X3N0bXADMTY2NzE0MDkzOQ--?p=user+story+examples&fr2=sb-top&fr=mcafee&type=E210GB714G0) 😉

A user story is usually written from the user’s perspective and follows the format:

**“As [a user persona], I want [to perform this action] so that [I can accomplish this goal].”**

* As a Purchase Manager I want to see Customers and their Orders
* As a User I want a line item totals and a Grand Total for each Customer Sales Order

**2022 Employability Guidance:**

**Graduate Developer Portfolio:** This work contributes to your of ‘evidence of work’.

We share good [***Developer Portfolio***](https://skilledev.com/software-developer-portfolio-examples/) with Industry especially those offering Develop Roles for YR2 placements or Final Year Graduates. We also share with our International SQL Training partners and the SQL Developer Community at large.

We do expect YR2 students to register for our Industry exhibition *at* [***ExpoTalent 2023***](https://www.tees.ac.uk/schools/scedt/expotees/expotalent.cfm)*event to showcase their* [***Developer Portfolio***](https://skilledev.com/software-developer-portfolio-examples/).

ExpoTalent 2023: I strongly recommend you present ICA TSQL Demos since industry is keen for you to present how you use SQL Server to develop supporting TSQL queries.

Focus also on your Semester 2 Group Projects. ‘assessment work in progress’. Your Mobile Apps / Websites will still be under construction. Industry is more interested in discussing your teams working rather than ‘finished’ product.

**Industry review and moderate your ICAs. We share good reports. Will it be your SQL Server work?**

A Grade ‘A’ or ‘B’ is good evidence to present along with other ICA work. Supporting comment need to be on your CV.

**ICA ,sql File Templates** are for you to utilise and scale your **SQL Server TSQL Coding Portfolio**.

* Utlise Data Diagram Views of Table(s) you work on, any TSQL Code, screenshot evidence in SSMS.
* Anything that makes your presentation fit for Industry.
* Reports, PowerPoints and/or mini-Videos on your SQL Server skills is ideal for your ICA SQL Portfolio.
* Remember you are to scope like the Lesson Demos, Lab Exercise - Solutions or sample Ica Demos on AdventureWorks provided.
* You may design your own PowerPoint, Report or Videos to present your evidence of each of the TSQL Modules.
* Remember SQL Server portfolio can be showcase at [***ExpoTalent***](https://www.tees.ac.uk/schools/scedt/expotees/expotalent.cfm)- **March 2023**
* **It is why new template has been provided.**
* **It adds to your** [***Developer Portfolio***](https://skilledev.com/software-developer-portfolio-examples/)**of work to present to prospective employers.**
* **Also utilise** [**Github**](https://docs.github.com/en/get-started) **as your repository for your** [***Developer Portfolio***](https://skilledev.com/software-developer-portfolio-examples/)

# SQL Server Practitioner Details:

*Please enter your details below:*

|  |  |  |
| --- | --- | --- |
| **SQL Server - TSQL Practitioner Details:** | | |
| A child holding a camera  Description automatically generated with medium confidence | Name: |  |
| Email Address: |  |
| Course: |  |
| Date: |  |
|  | Tutor: |  |

## SQL Server Practitioner Performance Rating:

*(Instructions: Complete this at the end. Simply adjust the red box to where you rate your TSQL skills. 😊 Base your performance rating on* ***ALL TSQL*** *content. If you are competent in TSQL 15-18 we consider you an Expert as a YR2 student and Industry ready. Some evidence but limited in quality for business functions] in TSQL 15-18 then you have the skills in place for YR2 placement. Command of most of TSQL 9-15 then you are intermediate and simply require more self-study).*

|  |
| --- |
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## Introduction to the SQL Practitioner:

*[Instructions: provide an overview (a sentence, paragraph or 2] on you and your aspirations as a junior – graduate developer. You will be asked at a job interview either in YR2 or YR3 so best practice your answer 😊]*

**Why you decided upon studying and pursuing your interests in becoming a graduate developer.**

## [Why you should learn SQL](https://uk.search.yahoo.com/search?fr=mcafee&type=E210GB714G0&p=why+learn+sql+server):

*[Instructions: provide an overview - a sentence, paragraph or 2]*

[why learn sql server for your career](https://uk.search.yahoo.com/search;_ylt=AwrkMhdupF1jeN0dDGQM34lQ;_ylc=X1MDMTM1MTIxMjgxMgRfcgMyBGZyA21jYWZlZQRmcjIDc2EtZ3Atc2VhcmNoBGdwcmlkAzR2TUdrUk16VFRhTElibVhqdlEyNUEEbl9yc2x0AzAEbl9zdWdnAzEwBG9yaWdpbgN1ay5zZWFyY2gueWFob28uY29tBHBvcwMyBHBxc3RyA3doeSBsZWFybiBzcWwgc2VydmVyBHBxc3RybAMyMARxc3RybAMzNgRxdWVyeQN3aHklMjBsZWFybiUyMHNxbCUyMHNlcnZlciUyMGZvciUyMHlvdXIlMjBjYXJlZXIEdF9zdG1wAzE2NjcxMjEzNzkEdXNlX2Nhc2UD?p=why+learn+sql+server+for+your+career&fr2=sa-gp-search&fr=mcafee&type=E210GB714G0)

**Why you recommend someone should learn SQL and what you should hope to gain from it.**

[graduate develop vacancy sql server](https://uk.search.yahoo.com/search;_ylt=AwrLBmzhQF5jIzEkjT0M34lQ;_ylc=X1MDMTM1MTIxMjgxMgRfcgMyBGZyA21jYWZlZQRmcjIDc2EtZ3Atc2VhcmNoBGdwcmlkA0ZpckM5UHNIUnllMkNlUDVLUFEuQkEEbl9yc2x0AzAEbl9zdWdnAzQEb3JpZ2luA3VrLnNlYXJjaC55YWhvby5jb20EcG9zAzEEcHFzdHIDZ3JhZHVhdGUgZGV2ZWxvcCB2YWNhbmN5IHNxbCAEcHFzdHJsAzI5BHFzdHJsAzM1BHF1ZXJ5A2dyYWR1YXRlJTIwZGV2ZWxvcCUyMHZhY2FuY3klMjBzcWwlMjBzZXJ2ZXIEdF9zdG1wAzE2NjcxMjE0NDMEdXNlX2Nhc2UD?p=graduate+develop+vacancy+sql+server&fr2=sa-gp-search&fr=mcafee&type=E210GB714G0)

*[Instructions: provide hyperlinks to 3 x Graduate Developer jobs requiring SQL that are appealing to you]*

# SQL Server Database Overview:

## SQL Server Database for Demos:

*Instructions: provide an overview of the SQL Server Database you are providing your TSQL Demos on. I have provided you an outline so feel free to personalise as you see fit.*

I am going to investigate the SQL Server Database [**insert Database name**] to develop range of useful TSQL Queries and Scripts to support **business functions** or **user requirements**.

The aim is to provide useful patterns of data to serve front end development technologies such as Web or Mobile Applications.

Provided below in this document are examples of my best TSQL Demos (Queries and Scripts) to support users of [**insert Database name**].

## SQL Server Database Diagrams:

*[Instructions: provide supporting ERD – or mini ERDs or Database Diagrams) and indicate the main Tables of interest for your supporting TSQL Demos]*

**SQL Practitioners TSQL Demos:**

## Introduction:

Provided below is an audit trail of my best examples of TSQL querying skills to support ‘business functions’ or user requirements for [*insert database name of interest*].

Instructions: I have provided **AdventureWorksLT2019 -TSQL Cheat Sheet** to support ICA Demos for TSQL Modules 03-08 and provided additional ICA Demos for TSQL Modules 09-18 using AdventureWorks2019.

You may merge Demo topics if required.

# TSQL Part 1: SQL Server Coding Basics

*Instructions: Please review the provided* ***AdvantureWorksLT2019******-TSQL Cheat Sheet****.*

*This covers ALL the basic TSQL skills from Modules 03 to 09. This will help new SQL Practitioner to become familiar with the basic SQL coding skills. You may then progress with TSQL Modules 09-18.*

*Provide similar comparable TSQL Demos using one of the ICA Server Databases. I have provided a simple entry for the 1st Demo 😉*

***YR2 students*** *who have completed TSQL Demos 03-08 can either scale some TSQL Code – no need for SSMS screenshots. Do note this content helps with your Portfolio.*

***YR2 - Direct Entry*** *or those carrying exemptions can add this content.*

*Main ICA content is regarded as* ***TSQL Modules 09-18*** *with TSQL 03-08 to be used as compensation to support Direct entry or YR1 exempt students.*

# TSQL03 to TSQL08: SQL Server Basics

Instructions: TSQL Modules [03-08] are optional for YR2 students who have successfully completed this activity in YR1 – SDD – SQL Server. Jump to the section for TSQL 09-18 Demos.

YR2 Direct Entry and those carrying YR1 compensations will find it more supportive to complete this section.

Do note it is your attempts on TSQL 09-18 which indicate your readiness for employability as a Graduate Developer.

This section covers the basics skills in using SSMS and scoping TSQL Queries either by code or by using the [Design Query in Editor](https://uk.search.yahoo.com/search;_ylt=AwrkNcIUMGBjOwE9UxsM34lQ;_ylu=Y29sbwNpcjIEcG9zAzEEdnRpZAMEc2VjA3Fydw--?type=E210GB714G0&fr=mcafee&ei=UTF-8&p=sql+server+design+query+in+editor&fr2=12642) how to use [Select](https://uk.search.yahoo.com/search;_ylt=AwrLApgXMGBj2Ks8V4AM34lQ;_ylc=X1MDMTM1MTIxMjgxMgRfcgMyBGZyA21jYWZlZQRmcjIDc2ItdG9wBGdwcmlkA081VzZURjNaUmllTVYyVGphdUhGTkEEbl9yc2x0AzAEbl9zdWdnAzQEb3JpZ2luA3VrLnNlYXJjaC55YWhvby5jb20EcG9zAzAEcHFzdHIDBHBxc3RybAMwBHFzdHJsAzI3BHF1ZXJ5A3NxbCUyMHNlcnZlciUyMHNlbGVjdCUyMHN0YXRlbWVudAR0X3N0bXADMTY2NzI0ODIxMw--?p=sql+server+select+statement&fr2=sb-top&fr=mcafee&type=E210GB714G0) statements to query data from table(s), [Join](https://uk.search.yahoo.com/search;_ylt=AwrIfJlTMGBjh2o8ntcM34lQ;_ylc=X1MDMTM1MTIxMjgxMgRfcgMyBGZyA21jYWZlZQRmcjIDc2ItdG9wBGdwcmlkA2FIX0I1S2w5U0d5b1MyOEkub0F4REEEbl9yc2x0AzAEbl9zdWdnAzAEb3JpZ2luA3VrLnNlYXJjaC55YWhvby5jb20EcG9zAzAEcHFzdHIDBHBxc3RybAMwBHFzdHJsAzI1BHF1ZXJ5A3NxbCUyMHNlcnZlciUyMGpvaW4lMjBzdGF0ZW1lbnQEdF9zdG1wAzE2NjcyNDgyNDE-?p=sql+server+join+statement&fr2=sb-top&fr=mcafee&type=E210GB714G0) across related tables, sort and filtering with [Where](https://uk.search.yahoo.com/search;_ylt=AwrLAphwMGBj3BQ9WhQM34lQ;_ylc=X1MDMTM1MTIxMjgxMgRfcgMyBGZyA21jYWZlZQRmcjIDc2ItdG9wBGdwcmlkA0VIWHZ5SHJwUlBDOHZQVTBwVGhHdUEEbl9yc2x0AzAEbl9zdWdnAzAEb3JpZ2luA3VrLnNlYXJjaC55YWhvby5jb20EcG9zAzAEcHFzdHIDBHBxc3RybAMwBHFzdHJsAzI2BHF1ZXJ5A3NxbCUyMHNlcnZlciUyMHdoZXJlJTIwc3RhdGVtZW50BHRfc3RtcAMxNjY3MjQ4MzAw?p=sql+server+where+statement&fr2=sb-top&fr=mcafee&type=E210GB714G0), modifying data and using built in functions for [insert database name]:

*[Instructions: Use AdvantureWorksLT2019 -TSQL Cheat Sheet for examples on this section]*

|  |  |
| --- | --- |
| **.sql File for**  **TSQL03-08 Demos:** | [insert a hyperlink to the corresponding .sql file] |

## Module 3: Writing SELECT Queries with single Table

**Why write Select queries?**

The purpose of the SELECT statement is to query database tables, apply logical manipulation to the data, and result a result set.

### Demo A1: Writing Simple SELECT Query

[Instructions: utilise the structure by presenting your TSQL Demo code and results as follows]

|  |
| --- |
| **TSQL Demo Code and SSMS Screenshot Results or Evidence:** |
| USE AdventureWorksLT2019;  GO  -- Select and execute the following query to retrieve all columns,  -- all rows from SalesLT.ProductCategory table  SELECT \*  FROM SalesLT.ProductCategory;    -- Step 7: Simple SELECT query with calculated column  -- Select and execute the following query to manipulate columns from the Sales.OrderDetails table.  -- Note the lack of name for the new calculated column.  SELECT SalesOrderID, ProductID, UnitPrice, OrderQty, (UnitPrice \* OrderQty)  FROM SalesLT.SalesOrderDetail; |

### Demo A2: Eliminating Duplicates with DISTINCT

### Demo A3: Using Column and Table Aliases Lesson

### Demo A4: Writing Simple CASE Expressions

## Module 4: Joining and Querying Multiple Tables

**Why use Joining and Querying Multiple Tables?**

By making multiple queries and joining the data in code will make multiple requests to your database, one for each table you need data from. The advantage of using a join in the SQL query will reduce the number of connection made to just one. This is especially advantageous if your database server is on a separate machine.

### Demo B1: How to provide data from 2 related tables with a Join

### Demo B2: How to Query with Inner Joins

### Demo B3: How to Query with Outer Joins

### Demo B4: How Query with Cross Joins and Self Joins

## Module 5: Sorting and Filtering Data

### Demo C1: How to Sort Data

### Demo C2: How to Filter Data with Predicates

### Demo C3: How to Filter Data with TOP and OFFSET-FETCH

### Demo C4: How to work with Unknown Values

## Module 6: Working with Data Types

### Demo D1: Working with Data Type examples

### Demo D2: Working with Character Data

### Demo D3: Working with Date and Time Data

## Module 7: Using DML to Modify Data

Why use Using DML to Modify Data?

DML is an abbreviation for Data Manipulation Language. Represents a collection of programming languages explicitly used to make changes to the data

### Demo E1: Adding Data to Tables

### Demo E2: Modifying and Removing Data

### Demo E3: Generating Automatic Column Values

## Module 8: Using Built-In Functions

Why do programmers use built in functions?

TSQL and programming languages use functions. The biggest reasons are functions allow you to do calculation and break programming into more manageable pieces.

### Demo F1: Writing Queries with Built-In Functions

### Demo F2: Using Conversion Functions

### Demo F3: Using Logical Functions

### Demo F4: Using Functions to Work with NULL

# TSQL Part 2: SQL Server Coding Functions and Features

The primary means of manipulating data in SQL is the Transact-Structured Query Language (T-SQL), a rich and complex scripting language with a great degree of flexibility.

This section provides a demonstration T-SQL code to support a range of typical business functions for [insert database name].

The aim is to provide a rich set of data to support the user requirements.

# TSQL09: Group and Aggregating Data

|  |  |
| --- | --- |
| **TSQL Module 9: Grouping and Aggregating Data**  What grouping or aggregating data demos can you recommend for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: Using Aggregate Functions |  |
| ICA Demo 2: Using the GROUP BY Clause |  |
| ICA Demo 3: Filtering Groups with HAVING |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why we use Grouping or Aggregating in SQL?**

Grouping is very useful for summarizing data that has repeated values. It is often used in conjunction with the aggregators MIN, MAX, COUNT, SUM and AVG.

GROUP BY collects identical values together in the column it is applied to. Then an aggregator can be used on another column based on those groupings.

## ICA Demo 1: Using Aggregate Functions

*[Instructions: copy and paste the following structure for each of your demos!]*

|  |  |
| --- | --- |
| **.sql File for Demos:** | [insert a hyperlink to the corresponding .sql file] |

|  |
| --- |
| **Useful Resources:** |
| [insert a hyperlink to useful resources for this section] |

|  |
| --- |
| **Business Function:** |
| As a user I would be interested in knowing the following aggregated data [insert columns] from the table [insert table].  I have provided a range of [insert list of aggregated functions used in your demos] |

|  |
| --- |
| **TSQL Demo Code:** |
|  |

|  |
| --- |
| **TSQL Demo - SSMS Screenshot Results or Evidence:** |
|  |

## ICA Demo 2: Using the GROUP BY Clause

|  |  |
| --- | --- |
| **.sql File for Demos:** | [insert a hyperlink to the corresponding .sql file] |

|  |
| --- |
| **Business Function:** |
| As a user I would be interested in |

|  |
| --- |
| **Useful Resources:** |
| [insert a hyperlink to useful resources for this section] |

|  |
| --- |
| **TSQL Demo Code:** |
|  |

|  |
| --- |
| **TSQL Demo - SSMS Screenshot Results or Evidence:** |
|  |

## ICA Demo 3: Filtering Groups with HAVING

|  |  |
| --- | --- |
| **.sql File for Demos:** | [insert a hyperlink to the corresponding .sql file] |

|  |
| --- |
| **Useful Resources:** |
| [insert a hyperlink to useful resources for this section] |

|  |
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| **Business Function:** |
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| **TSQL Demo Code:** |
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| **TSQL Demo - SSMS Screenshot Results or Evidence:** |
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# TSQL10: Using Subqueries

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| **TSQL Module 10: Using Subqueries**  What subqueries demos can you recommend for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: Writing Self-Contained Subqueries |  |
| ICA Demo 2: Writing Correlated Subqueries |  |
| ICA Demo 3: Using the EXISTS Predicate with Subqueries |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why we use Subqueries in SQL?**

A subquery is a query that appears inside another query statement. In SQL, it's possible to place a SQL query inside another query known as subquery.

For example, SELECT \* FROM Customers WHERE age = (SELECT MIN(age) FROM Customers)

## ICA Demo 1: Writing Self-Contained Subqueries

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| **.sql File for Demos:** | [insert a hyperlink to the corresponding .sql file] |

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| **Useful Resources:** |
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## ICA Demo 2: Writing Correlated Subqueries

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| **Useful Resources:** |
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| **Business Function:** |
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| **TSQL Demo Code:** |
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## ICA Demo 3: Using the EXISTS Predicate with Subqueries

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# TSQL11: Using Table Expressions

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| **TSQL Module 11: Using SQL Views** **and Common Table Expressions CTE**  What Views and CTE demos can you recommend Views and CTE for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: Using Views |  |
| ICA Demo 2: Using Inline TVFs |  |
| ICA Demo 3: Using Derived Tables |  |
| ICA Demo 4: Using CTEs |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why we use Views in SQL?**

A view is a virtual table based on the result-set of an SQL statement. A view contains rows and columns, just like a real table. Eg: Joining tables customers & orders on the custID to create a view of Customer-Orders.

Views are used to restrict data access. A View contains no data of its own, but it is like a window through which data from related tables can be viewed or changed. There are 2 types of Views in SQL: Simple View and Complex View.

The second type of user-defined function, the inline table-valued function, is like a view. Both are wrapped for a stored SELECT statement. An inline table-valued user-defined function retains the benefits of a view and adds parameters.

## ICA Demo 1: Using Views

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| **Useful Resources:** |
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## ICA Demo 2: Using Inline TVFs

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| **Useful Resources:** |
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| **Business Function:** |
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## ICA Demo 3: Using Derived Tables

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| **Business Function:** |
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| **TSQL Demo Code:** |
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| **TSQL Demo - SSMS Screenshot Results or Evidence:** |
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## ICA Demo 4: Using CTEs

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| **Useful Resources:** |
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| **TSQL Demo Code:** |
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| **TSQL Demo - SSMS Screenshot Results or Evidence:** |
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# TSQL12: Using Views and Set Operators

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| **TSQL Module 12: Using Views and Set Operators**  What data from related tables would provide useful as Views and CTE for supporting business functions or User? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: Writing Queries using Union Intersect Except set operators |  |
| ICA Demo 2: More on set operators |  |
| ICA Demo 3: Create inline Table-valued Function |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why we use set operators in SQL?**

Set operators are used to combine results from two or more SELECT statements. They combine the same type of data from two or more tables. This looks like SQL joins although there is a difference. SQL joins are used to combine columns whereas Set operators are used to join rows from multiple SELECT queries.

## ICA Demo 1: Writing Queries using Union Intersect Except set operators

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## ICA Demo 2: More on set operators

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| **Useful Resources:** |
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## ICA Demo 3: Create inline Table-valued Function

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# TSQL13: Using Window Ranking, Offset, and Aggregate Functions

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| **TSQL Module 13: Using CTE Views, Windows Ranking and Partition By**  What Views and CTE demos can you recommend Views and CTE for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA TSQL Demo 1 - Partition By Row Number function |  |
| ICA TSQL Demo 2 - Windows Ranking (or Windows Rank with partition |  |
| ICA TSQL Demo 3 - OVER Clause (or CTE Function with Over |  |
| ICA TSQL Demo 4 - Writing Aggregate function in Partition By |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why we use Rank & Offset in SQL?**

The RANK() function is a window function could be used in SQL Server to calculate a rank for each row within a partition of a result set.

The OFFSET argument is used to identify the starting point to return rows from a result set.

## ICA TSQL Demo 1 - Partition By Row Number function

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## ICA TSQL Demo 2 - Windows Ranking (or Windows Rank with partition

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| **Useful Resources:** |
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## ICA TSQL Demo 3 - OVER Clause (or CTE Function with Over)

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## ICA TSQL Demo 4 - Writing Aggregate function in Partition By

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# TSQL14: Pivoting and Grouping Sets

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| TSQL Module 14: Pivoting and Grouping Sets  What Pivot and Grouping Sets demos can you recommend for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: Working with Grouping Sets |  |
| ICA Demo 2: Writing Queries with PIVOT and UNPIVOT |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why do we use Grouping Sets in SQL?**

GROUPING SETS are groups, or sets, of columns by which rows can be grouped together. Instead of writing multiple queries and combining the results with a UNION, you can simply use GROUPING SETS. GROUPING is used to distinguish the null values that are returned by ROLLUP, CUBE or GROUPING SETS from standard null values. For example, I may want to group Customers in City or Country and rank them in ‘total sales’.

**Why do we use pivot in SQL?**

You can use the PIVOT and UNPIVOT relational operators to change rows to a column & columns to a row as another table. PIVOT rotates a table-valued expression by turning the unique values from one column in the expression into multiple columns in the output. Grouping Sets are always good to also provide as Pivot Tables.

## ICA Demo 1: Working with Grouping Sets

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| **Useful Resources:** |
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| **TSQL Demo Code:** |
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## ICA Demo 2: Writing Queries with PIVOT and UNPIVOT

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# TSQL Part 3: SQL Server Programming

Instructions: TSQL Modules [15-18] are what indicate your readiness as a Graduate Developer.

If you are to demonstrate a strong understanding in this section, you are deemed industry ready. It is simply a matter of ‘self study’ to become competent by end of your YR3.

The previous section demonstrated range of TSQL queries and scripts (code) to support **business functions** and **user requirements**.

This section demonstrates the ability to further develop T-SQL into programmable routines. The aim is to become proficient in providing a great deal more functionality and THE ability to manipulate the data to support business functions. This section covers:

* How to invoke TSQL queries and scripts as Stored Procedures.
* How to use input parameters with Stored Procedures.
* How to handle errors
* How to combine into programmable transactions

# TSQL15: Executing Stored Procedures

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| **TSQL Module 15: Executing Stored Procedures**  What Stored Procedure demos can you recommend for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: T-SQL Stored Procedure |  |
| ICA Demo 2: T-SQL Stored Procedures with Parameters |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why we use stored procedure instead of query?**

It is how we develop programs as procedures. A stored procedure is invoked as a function call instead of a SQL query. Stored procedures can have parameters for both passing values into the procedure and returning values from the call. Results can be returned as a result set, or as an OUT-parameter cursor.

A stored procedure is a prepared SQL code that you can save, so the code can be reused repeatedly. So if you have an SQL query that you write over and over again, save it as a stored procedure call whenever we want to execute it.

## ICA Demo 1: T-SQL Stored Procedure

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## ICA Demo 2: TSQL Stored Procedures with Parameters

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# TSQL16: Programming with T-SQL

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| **TSQL Module 16: Programming with T-SQL**  What programming demos can you recommend for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: T-SQL programming and Stored Procedure |  |
| ICA Demo 2: T-SQL programming with Parameters |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why Programming with T-SQL?**

Programming T-SQL statements enables IT pros to build applications contained within SQL Server. These applications -- or objects -- can insert, update, delete or read data stored in a database.

## ICA Demo 1: T-SQL programming and Stored Procedure

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## ICA Demo 2: T-SQL programming with Parameters

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| **Useful Resources:** |
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# TSQL Module 17: Implementing Error Handling

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| **TSQL Module 17: Implementing Error Handling**  What error handling demos can you recommend for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: Implementing T-SQL Error Handling |  |
| ICA Demo 2: Implementing Structured Exception Handling |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why Error Handling in SQL?**

Error handling in SQL Server gives us control over the Transact-SQL code. For example, when things go wrong, we get a chance to do something about it and possibly make it right again. SQL Server error handling can be as simple as just logging that something happened, or it could be us trying to fix an error.

*1970s – Banking Systems: As a customer I am withdrawing money from a cashpoint. I enter my pin, view my balance, select how much I wish to withdraw, my balance is debited but I am issued no money … It happens. The system needs to roll back to last recovery point. How is this done?*

## ICA Demo 1: Implementing T-SQL Error Handling

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| **Useful Resources:** |
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| **TSQL Demo - SSMS Screenshot Results or Evidence:** |
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## ICA Demo 2: Implementing Structured Exception Handling

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| **TSQL Demo Code:** |
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# TSQL Module 18: Implementing Transactions

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| **TSQL Module 18: Implementing Transactions**  What transaction demos can you recommend for supporting business functions or Users of the Database? | Self-Assessment Rating  Insert value 1-5 |
| ICA Demo 1: Transactions |  |
| ICA Demo 2: Controlling Transactions |  |
| Overall TSQL Rating on this TSQL Module: |  |

**Why Are Transactions Necessary?**

Transactions are part of how SQL Server implements the [ACID properties](https://uk.search.yahoo.com/search;_ylt=AwrLAT5JV15ja3Qln0EM34lQ;_ylc=X1MDMTM1MTIxMjgxMgRfcgMyBGZyA21jYWZlZQRmcjIDc2ItdG9wBGdwcmlkA3BIckQ1MDlNU2J5YVQ0MzZZZVU3LkEEbl9yc2x0AzAEbl9zdWdnAzQEb3JpZ2luA3VrLnNlYXJjaC55YWhvby5jb20EcG9zAzAEcHFzdHIDBHBxc3RybAMwBHFzdHJsAzM1BHF1ZXJ5A3doYXQlMjBpcyUyMFNRTCUyMFNlcnZlciUyMEFDSUQlMjBwcm9wZXJ0aWVzJTIwBHRfc3RtcAMxNjY3MTI3NDk2?p=what+is+SQL+Server+ACID+properties+&fr2=sb-top&fr=mcafee&type=E210GB714G0) of a database (atomicity, consistency, isolation, and durability) along with mechanisms like locking and logging.

## ICA Demo 1: Transactions

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## ICA Demo 2: Controlling Transactions

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| **TSQL Demo Code:** |
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| **TSQL Demo - SSMS Screenshot Results or Evidence:** |
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# Appendix