

Database In Finance: SQL

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Introduction

- **What is SQL**
- Dataset Overview
- SQLite Online IDE

**YES I DO HAVE A
SPECIAL SKILL SET...**

WHAT? NO... WHAT THE HELL IS SQL?

SQL FUNDAMENTALS: What is SQL?

SQL is Structured Query Language, which is a computer language for storing, manipulating and retrieving data stored in a relational database.

SQL is the standard language for Relational Database System.

SQL FUNDAMENTALS: What is SQL?

>> All the Relational Database Management Systems (RDMS) like MySQL, MS Access, Oracle, Sybase, Informix, Postgres and SQL Server use SQL as their standard database language.

Also, they are using different dialects, such as

- MS SQL Server using T-SQL,
- Oracle using PL/SQL,
- MS Access version of SQL is called JET SQL (native format) etc.

>> Versions

SQL FUNDAMENTALS: SQL Query Examples

```
SQLQuery3.sql - T61...14 (T61\boksi (57)) * X
SELECT p.Name AS ProductName,
NonDiscountSales = (OrderQty * UnitPrice),
Discounts = ((OrderQty * UnitPrice) * UnitPriceDiscount)
FROM Production.Product AS p
INNER JOIN Sales.SalesOrderDetail AS sod
ON p.ProductID = sod.ProductID
ORDER BY ProductName DESC;

SELECT 'Total income is', ((OrderQty * UnitPrice) * (1.0 - UnitPriceDiscount)), ' for ',
p.Name AS ProductName
FROM Production.Product AS p
INNER JOIN Sales.SalesOrderDetail AS sod
ON p.ProductID = sod.ProductID
ORDER BY ProductName ASC;

SELECT DISTINCT pp.LastName, pp.FirstName
FROM Person.Person pp JOIN HumanResources.Employee e
ON e.BusinessEntityID = pp.BusinessEntityID WHERE pp.BusinessEntityID IN
(SELECT SalesPersonID
FROM Sales.SalesOrderHeader
WHERE SalesOrderID IN
(SELECT SalesOrderID
FROM Sales.SalesOrderDetail
WHERE ProductID IN
(SELECT ProductID
FROM Production.Product p
WHERE ProductNumber = 'BK-M688-42')));

SELECT ProductID, AVG(OrderQty) AS AverageQuantity, SUM(LineTotal) AS Total
FROM Sales.SalesOrderDetail
GROUP BY ProductID
HAVING SUM(LineTotal) > $1000000.00
AND AVG(OrderQty) < 3;

SELECT pp.FirstName, pp.LastName, e.NationalIDNumber
FROM HumanResources.Employee AS e WITH (INDEX(AK_Employee_NationalIDNumber))
JOIN Person.Person AS pp on e.BusinessEntityID = pp.BusinessEntityID
WHERE LastName = 'Johnson';
```

```
1 Select * from Apps
```

SQL FUNDAMENTALS: SQL query structure

```
SELECT DISTINCT column_list  
FROM table_list  
JOIN table ON join_condition  
WHERE row_filter  
ORDER BY column  
LIMIT count OFFSET offset  
GROUP BY column  
HAVING group_filter;
```

- SELECT statement example is used to extract data
- Clauses: JOIN, WHERE, ORDER BY, LIMIT, GROUP BY, HAVING, etc.
- Good Practice is each clause starts from new line

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DATASET OVERVIEW: BROKERAGE DATASET SCHEMA

AccountManagers

Column

- AccountManagerID INTEGER
- AccountManager TEXT
- AccountManagerPhone TEXT

Customers

Column

- CustomerID INTEGER
- Customer INTEGER
- CustomerEmail TEXT
- CustomerSince TEXT
- AccountManagerID INTEGER
- CountryResidence TEXT
- CustomerClass TEXT
- PermitIDNeed TEXT
- CustomerAge INTEGER

PortfolioAmounts

Column

- AmountPosition REAL
- CustomerID INTEGER
- PortfolioPositionsID INTEGER

PortfolioPositions

Column

- PortfolioPositionsID INTEGER
- PortfolioPosition TEXT
- PositionType TEXT
- StockType TEXT



DATASET OVERVIEW: Customers

⋮ C...	Customer	CustomerEmail	Custom...	Acc...	Country...	CustomerClass	PermitID...	Customer...
1	16361014...	Integer.tincidunt@euismo...	2020-01-31	1	United Ki...	Top	Yes	26
2	16721110...	ac.nulla@metus.ca	2019-05-06	2	Canada	Top	Yes	25
3	16970813...	adipiscing@Integerin.ca	2018-08-12	3	France	Top	No	35
4	16211205...	ultrices.iaculis.odio@Nun...	2018-06-25	4	Canada	Middle	Yes	61
5	16561007...	Aliquam@porttitortellus.ca	2019-11-13	4	Germany	Middle	No	46
6	16841024...	luctus.Curabitur.egestas...	2020-07-30	5	France	Middle	No	64
7	16940829...	nulla@iacusvestibulumlo...	2019-05-26	1	Germany	Bottom	No	33
8	16581108...	aliquet@MaurisnullaInteg...	2020-07-13	1	Germany	Bottom	No	60

DATASET OVERVIEW: Account Managers

AccountManagerID	AccountManager	AccountManagerPhone
1	Redford	(559) 915-8906
2	Green	(314) 337-4964
3	Mellow	(470) 839-7098
4	Violet	(510) 524-5590
5	Blumfield	(489) 157-1767
6	Moran	(389) 102-6318
7	Mindigo	(102) 261-1052

DATASET OVERVIEW: Portfolio Amounts

AmountPosition	CustomerID	PortfolioPositionsID
6750.81	1	1
5355.9	1	2
8499.15	1	3
7871.49	1	5
8779.32	1	11
1742.4	2	1
6341.94	2	2
5018.31	2	11

DATASET OVERVIEW: DEMO S&P 500

Symbol	Name	Sector	Price	PriceToEarnings	Dividend_Yield
MMM	3M Company	Industrials	222.89	24.31	2.3328617
AOS	A.O. Smith Corp	Industrials	60.24	27.76	1.1479592
ABT	Abbott Laboratories	Health Care	56.27	22.51	1.9089824
ABBV	AbbVie Inc.	Health Care	108.48	19.41	2.4995599
ACN	Accenture plc	Information Technology	150.51	25.47	1.7144699
ATVI	Activision Blizzard	Information Technology	65.83	31.8	0.43190324
AYI	Acuity Brands Inc	Industrials	145.41	18.22	0.35118526
ADBE	Adobe Systems Inc	Information Technology	185.16	52.31	0
AAP	Advance Auto Parts	Consumer Discretionary	109.63	19.54	0.21832074
AAPL	Apple Inc	Information Technology	145.00	107	0

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SQLite Online IDE Overview

- SQLite section
 - Tables and columns
- Overview of the tables
- Code field
 - New tabs
 - Auto-suggestion, copy to IDE
 - Run
- Query Result View
 - Column Widths
- History
- Export CSV



Integrated Development Environment

ARCHIVE YOUR DATA

File >> Save History - SQLite

A screenshot of the SQL Online IDE interface. The 'File' menu is open, and the 'Save history - SQLite' option is highlighted with a red box. A red arrow points from this option to the 'Save history - SQLite' option in the table below.

1. SELECT * FROM demo

ID	Name	Hint
1	SQL Online	for Data Science
2	Chart	LINE-SELECT name, cos(id), sin(id) FROM demo;
3	Short CODE	s* tableName => SELECT * FROM tableName sf tableName...
4	SQLite 3.35.4	SQL OnLine on JavaScript
5	MultiVersion	3.28.0 to Last (load on settings)
6	[RightClick] mouse	Opens many additional features
7	Left-Panel, Table	[RightClick] mouse "Context menu" or [DbClick]
8	Tabs	mouse: [RightClick] , [MiddleClick] , [Wheel] , [LeftClick]
9	SQL Editor	autocomplete: [Ctrl-Space] or [Alt-Space]

PRACTICE: SQLite IDE

- Download the database file
- Upload database (File >> Open DB >> choose the downloaded file: brokerage.db)
- **Review tables (test Show Table option to open each table)**
- **Try to open new code tabs**
- **Try to save individual code tab**
- **Try to export CSV**
- **Try to save history**

Dataset Link:

https://bit.ly/data_db_finance also uploaded in the e-learn platform.