

*Participate to this unique 2 day seminar in Brussels
on October 25-26, 2012 !*

SQL and Relational Theory: **How to Write Accurate SQL Code**

*a **Chris Date** Master Class*



Chris Date is the world's best known relational advocate. In this seminar, he shows you how to write SQL code that's logically correct; how to avoid various SQL traps and pitfalls; and, more generally, how to use SQL as if it were a true relational language.

I didn't know there was so much I didn't know!

—attendee at a recent offering of this seminar

ABOUT THIS SEMINAR

SQL is ubiquitous. But SQL is complicated, difficult, and error prone (much more so than SQL advocates would have you believe), and testing can never be exhaustive. So to have any hope of writing correct SQL, you must follow some discipline. What discipline? *Answer:* The discipline of using SQL relationally. But what does this mean? Isn't SQL relational anyway?

Well, of course SQL is the standard language for use with relational databases—but that doesn't make it relational! The sad truth is, SQL departs from relational theory in all too many ways; duplicate rows and nulls provide two obvious examples, but they're not the only ones. To be a profound professional, you need to understand relational theory (what it is and why); you need to know about SQL's departures from that theory; and you need to know how to avoid the problems they can cause. In a word, you need to use SQL relationally. Then you can behave as if SQL truly were relational, and you can enjoy the benefits of working with what is, in effect, a truly relational system.

Of course, a seminar like this wouldn't be needed if everyone already used SQL relationally—but they don't. The relational model first saw the light of day in 1969—yet here we are, over 40 years later, and it still doesn't seem to be very well understood by the database community at large. Partly for such reasons, this seminar uses the relational model itself as an organizing principle; it discusses various features of the model in depth, and shows in every case how best to use SQL to implement the feature in question.

TOPIC OUTLINE

1. Setting the scene
 - ✓ Codd's relational model
 - ✓ SQL terminology vs. relational terminology
 - ✓ Model vs. implementation
 - ✓ Properties of relations
 - ✓ Base vs. derived relations
 - ✓ Relations vs. relvars
 - ✓ *The Third Manifesto* and **Tutorial D**
 - ✓ Wittgenstein's dictum
2. Types and domains
 - ✓ Domains are types
 - ✓ Types and operators
 - ✓ System vs. user defined types
 - ✓ Scalar vs. nonscalar types
 - ✓ Scalar types in SQL
 - ✓ SQL type checking and coercion
 - ✓ "Possibly nondeterministic" expressions
 - ✓ SQL row and table types
3. Tuples and relations, rows and tables
 - ✓ What's a tuple?
 - ✓ Rows in SQL
 - ✓ What's a relation?
 - ✓ Relations are n -dimensional
 - ✓ Relational comparisons
 - ✓ TABLE_DUM and TABLE_DEE
 - ✓ Tables in SQL
 - ✓ A column naming discipline
4. No duplicates, no nulls
 - ✓ What's wrong with duplicates?
 - ✓ Avoiding duplicates in SQL
 - ✓ What's wrong with nulls?
 - ✓ Avoiding nulls in SQL
 - ✓ A remark on outer join
 - ✓ Implications and ramifications
5. Base relvars, base tables
 - ✓ Data definition
 - ✓ Updating is set level
 - ✓ Relational assignment
 - ✓ D_INSERT, I_DELETE, and other shorthands
 - ✓ Candidate and foreign keys
 - ✓ Predicates and propositions
 - ✓ *The Closed World Assumption*
6. SQL and relational algebra I: The original operators
 - ✓ Importance of closure
 - ✓ Relation type inference rules
 - ✓ Attribute renaming
 - ✓ Restriction, projection, join
 - ✓ Union, intersection, difference
 - ✓ Primitive operators
7. SQL and relational algebra II: Additional operators
 - ✓ WITH and complex expressions
 - ✓ What expressions mean
 - ✓ Evaluating SQL expressions
 - ✓ Expression optimization
 - ✓ Semijoin and semidifference
 - ✓ Extend
 - ✓ Image relations
 - ✓ Aggregation and summarization
8. SQL and constraints
 - ✓ Type constraints
 - ✓ Type constraints in SQL
 - ✓ Database constraints
 - ✓ Database constraints in SQL
 - ✓ The role of transactions
 - ✓ Immediate vs. deferred checking
 - ✓ Multiple assignment
 - ✓ Constraints vs. predicates
 - ✓ **The Golden Rule**
 - ✓ Correctness vs. consistency
9. SQL and logic I: Relational calculus
 - ✓ Natural language is often ambiguous
 - ✓ Propositions and predicates
 - ✓ Connectives
 - ✓ Truth functional completeness
 - ✓ Quantification: EXISTS, FORALL, UNIQUE
 - ✓ Range variables and correlation names
 - ✓ Calculus expressions
 - ✓ Queries and constraints
 - ✓ SQL support
 - ✓ Transforming expressions
 - ✓ Relational completeness
10. SQL and logic II: Using logic to write SQL code
 - ✓ Important identities
 - ✓ SQL and implication
 - ✓ SQL and FORALL
 - ✓ Correlated subqueries
 - ✓ Naming subexpressions
 - ✓ Dealing with ambiguity
 - ✓ Using COUNT
 - ✓ ALL or ANY comparisons
 - ✓ GROUP BY and HAVING
11. The relational model
 - ✓ Why databases must be relational
 - ✓ Theory is practical
 - ✓ The relational model defined
 - ✓ What a database *really* is
 - ✓ The relational model vs. others
 - ✓ Essentiality

WHO SHOULD ATTEND

- ✓ Database application designers and implementers
- ✓ Information modelers and database designers
- ✓ Data and database administrators
- ✓ Computer science professors specializing in database matters
- ✓ DBMS designers, implementers, and other vendor personnel
- ✓ Database consultants
- ✓ People responsible for DBMS product evaluation and acquisition

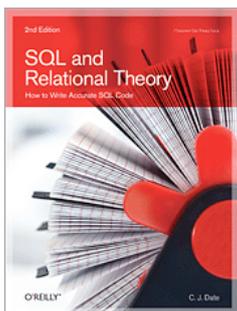
The seminar is *not* meant for beginners: Attendees will be expected to have at least an elementary familiarity with database concepts in general and the SQL language in particular.

OBJECTIVES

On completion of this seminar, attendees will:

- ✓ Have a solid understanding of relational theory
- ✓ Appreciate how that theory provides SQL's logical underpinnings
- ✓ Understand the breadth and depth of that theory
- ✓ Know how to formulate complex SQL code with confidence that it's correct
- ✓ Generally, be able to use SQL relationally

SPEAKER: Chris Date



C. J. Date is an independent author, lecturer, researcher, and consultant, specializing in relational database technology. He is best known for his book *An Introduction to Database Systems* (eighth edition, Addison-Wesley, 2004), which has sold well over 850,000 copies and is used by several hundred colleges and universities worldwide. He is also the author of many other books on database management, including most recently:

- ✓ From Morgan Kaufmann: *Temporal Data and the Relational Model* (coauthored with Hugh Darwen and Nikos A. Lorentzos, 2003)
- ✓ From Addison-Wesley: *Databases, Types, and the Relational Model: The Third Manifesto* (coauthored with Hugh Darwen, 2006)
- ✓ From Apress: *Date on Database: Writings 2000-2006* (2006) and *The Relational Database Dictionary, Extended Edition* (2008)
- ✓ From Trafford: *Logic and Databases: The Roots of Relational Theory* (2007) and *Database Explorations: Essays on The Third Manifesto and Related Topics* (coauthored with Hugh Darwen, 2010)
- ✓ From O'Reilly: *SQL and Relational Theory: How to Write Accurate SQL Code* (2nd edition, 2012) and *Database Design and Relational Theory: Normal Forms and All That Jazz* (2012)

Mr. Date was inducted into the Computing Industry Hall of Fame in 2004. He enjoys a reputation that is second to none for his ability to communicate complex technical subjects in a clear and understandable fashion.



PRACTICAL INFORMATION

SEMINAR LOCATION

SWORD Technologies
Tervurenlaan 270
B-1150 Brussels

DATE & HOUR

This is a two days seminar on:
Thursday October 25 from 9h until 16.30h
Friday October 26 from 9h until 16.30h

PARTICIPATION FEE

€ 590 (+ 21% VAT)

The fee includes all seminar documentation, lunch and coffee breaks.

HOW TO REGISTER

You are officially registered on receipt of the payment of the participation fee on the account of RE BVBA

You can pre-register by sending an e-mail to:

Tony.Claes@re.be

detailing your personal & company information.

Once pre-registered, you will receive detailed payment information and a provisional invoice.

EARLY REGISTRATION & DISCOUNTS

The participants registered before September 10, 2012 are entitled to a 15% discount.

For simultaneous registrations (one invoice), the 2nd and subsequent participants of the same company receive a 10% discount.

A 25% discount is given to participants from universities.

CANCELLATION POLICY

A full refund is given for any cancellation received more than 15 days before the seminar starts.

Cancellations less than 15 days prior to the event are liable for 50 % of the fee. Cancellations less than one week prior to the event date will be liable to the full fee.

CANCELLATION LIABILITY

In the case of cancellation of the event for any reason, RE BVBA's liability is limited to the return of the registration fee only.

ORGANIZATION

This seminar is organized by RE BVBA, Papenhof 15 B-3583 Beringen.

The seminar location is made available by SWORD Technologies, a company of the SWORD GROUP.