

# SQL Language Pocket Reference

Collection (abstract data type)

*Pribyl, Bill; Dawes, Chip (1999). "Collections in PL/SQL". Oracle PL/SQL Language Pocket Reference (4 ed.). Sebastopol, California: O'Reilly Media, Inc*

In computer programming, a collection is an abstract data type that is a grouping of items that can be used in a polymorphic way.

Often, the items are of the same data type such as int or string. Sometimes the items derive from a common type; even deriving from the most general type of a programming language such as object or variant.

Although easily confused with implementations in programming languages, collection, as an abstract concept, refers to mathematical concepts which can be misunderstood when the focus is on an implementation. For example, a priority queue is often implemented as a heap, while an associative array is often implemented as a hash table, so these abstract types are often referred to by this preferred implementation, as a "heap" or a "hash", though this is incorrect conceptually.

Hierarchical and recursive queries in SQL

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A hierarchical query is a type of SQL query that handles hierarchical model data. They are special cases of more general recursive fixpoint queries, which compute transitive closures.

In standard SQL:1999 hierarchical queries are implemented by way of recursive common table expressions (CTEs). Unlike Oracle's earlier connect-by clause, recursive CTEs were designed with fixpoint semantics from the beginning. Recursive CTEs from the standard were relatively close to the existing implementation in IBM DB2 version 2. Recursive CTEs are also supported by Microsoft SQL Server (since SQL Server 2008 R2), Firebird 2.1, PostgreSQL 8.4+, SQLite 3.8.3+, IBM Informix version 11.50+, CUBRID, MariaDB 10.2+ and MySQL 8.0.1+. Tableau has documentation describing how CTEs can be used. TIBCO Spotfire does not support CTEs, while Oracle 11g Release 2's implementation lacks fixpoint semantics.

Without common table expressions or connected-by clauses it is possible to achieve hierarchical queries with user-defined recursive functions.

Steven Feuerstein

*Oracle PL/SQL Language Pocket Reference, Fourth Edition, O'Reilly Media, October 2007, ISBN 0-596-51404-2 with Bill Pribyl. Oracle PL/SQL Programming*

Steven Feuerstein is an author focusing on the Oracle database PL/SQL language, having published several books on this language through O'Reilly Media. Feuerstein has worked with Oracle Database technology - and worked twice for Oracle Corporation - since 1987, and has been developing software since 1980.

C Sharp (programming language)

*ISBN 978-1617294532. Drayton, Peter; Albahari, Ben; Neward, Ted (2002). C# Language Pocket Reference. O'Reilly. ISBN 0-596-00429-X. Petzold, Charles (2002). Programming*

C# ( see SHARP) is a general-purpose high-level programming language supporting multiple paradigms. C# encompasses static typing, strong typing, lexically scoped, imperative, declarative, functional, generic, object-oriented (class-based), and component-oriented programming disciplines.

The principal inventors of the C# programming language were Anders Hejlsberg, Scott Wiltamuth, and Peter Golde from Microsoft. It was first widely distributed in July 2000 and was later approved as an international standard by Ecma (ECMA-334) in 2002 and ISO/IEC (ISO/IEC 23270 and 20619) in 2003. Microsoft introduced C# along with .NET Framework and Microsoft Visual Studio, both of which are technically speaking, closed-source. At the time, Microsoft had no open-source products. Four years later, in 2004, a free and open-source project called Microsoft Mono began, providing a cross-platform compiler and runtime environment for the C# programming language. A decade later, Microsoft released Visual Studio Code (code editor), Roslyn (compiler), and the unified .NET platform (software framework), all of which support C# and are free, open-source, and cross-platform. Mono also joined Microsoft but was not merged into .NET.

As of January 2025, the most recent stable version of the language is C# 13.0, which was released in 2024 in .NET 9.0

## Microsoft Access

*relative compatibility with SQL (structured query language)—queries can be viewed graphically or edited as SQL statements, and SQL statements can be used directly*

Microsoft Access is a database management system (DBMS) from Microsoft that combines the relational Access Database Engine (ACE) with a graphical user interface and software-development tools. It is part of the Microsoft 365 suite of applications, included in the Professional and higher editions or sold separately.

Microsoft Access stores data in its own format based on the Access Database Engine (formerly Jet Database Engine). It can also import or link directly to data stored in other applications and databases.

Software developers, data architects and power users can use Microsoft Access to develop application software. Like other Microsoft Office applications, Access is supported by Visual Basic for Applications (VBA), an object-based programming language that can reference a variety of objects including the legacy DAO (Data Access Objects), ActiveX Data Objects, and many other ActiveX components. Visual objects used in forms and reports expose their methods and properties in the VBA programming environment, and VBA code modules may declare and call Windows operating system operations.

## List of Microsoft codenames

*for SQL Server 2008&quot;. MSDN. Microsoft. October 2010. Archived from the original on March 9, 2022. Retrieved November 11, 2010. &quot;ChannelWeb: Next SQL Server*

Microsoft codenames are given by Microsoft to products it has in development before these products are given the names by which they appear on store shelves. Many of these products (new versions of Windows in particular) are of major significance to the IT community, and so the terms are often widely used in discussions before the official release. Microsoft usually does not announce a final name until shortly before the product is publicly available. It is not uncommon for Microsoft to reuse codenames a few years after a previous usage has been abandoned.

There has been some suggestion that Microsoft may move towards defining the real name of their upcoming products earlier in the product development lifecycle to avoid needing product codenames.

## Pick operating system

*extended procedural language and called it RPL. PROC, the procedure language was provided for executing scripts. A SQL-style language called ENGLISH allowed*

The Pick Operating System, also known as the Pick System or simply Pick, is a demand-paged, multi-user, virtual memory, time-sharing computer operating system based around a MultiValue database. Pick is used primarily for business data processing. It is named after one of its developers, Dick Pick.

The term "Pick system" has also come to be used as the general name of all operating environments which employ this multivalued database and have some implementation of Pick/BASIC and ENGLISH/Access queries. Although Pick started on a variety of minicomputers, the system and its various implementations eventually spread to a large assortment of microcomputers, personal computers, and mainframe computers.

Rust (programming language)

*general-purpose programming language emphasizing performance, type safety, and concurrency. It enforces memory safety, meaning that all references point to valid memory*

Rust is a text-based general-purpose programming language emphasizing performance, type safety, and concurrency. It enforces memory safety, meaning that all references point to valid memory. It does so without a conventional garbage collector; instead, memory safety errors and data races are prevented by the "borrow checker", which tracks the object lifetime of references at compile time.

Rust supports multiple programming paradigms. It was influenced by ideas from functional programming, including immutability, higher-order functions, algebraic data types, and pattern matching. It also supports object-oriented programming via structs, enums, traits, and methods.

Software developer Graydon Hoare created Rust as a personal project while working at Mozilla Research in 2006. Mozilla officially sponsored the project in 2009. The first stable release of Rust, Rust 1.0, was published in May 2015. Following a large layoff of Mozilla employees in August 2020, multiple other companies joined Mozilla in sponsoring Rust through the creation of the Rust Foundation in February 2021. In December 2022, Rust became the first language other than C and assembly to be supported in the development of the Linux kernel.

Rust has been noted for its adoption in many software projects, especially web services and system software. It has been studied academically and has a growing community of developers.

Lisp (programming language)

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Lisp (historically LISP, an abbreviation of "list processing") is a family of programming languages with a long history and a distinctive, fully parenthesized prefix notation.

Originally specified in the late 1950s, it is the second-oldest high-level programming language still in common use, after Fortran. Lisp has changed since its early days, and many dialects have existed over its history. Today, the best-known general-purpose Lisp dialects are Common Lisp, Scheme, Racket, and Clojure.

Lisp was originally created as a practical mathematical notation for computer programs, influenced by (though not originally derived from) the notation of Alonzo Church's lambda calculus. It quickly became a favored programming language for artificial intelligence (AI) research. As one of the earliest programming languages, Lisp pioneered many ideas in computer science, including tree data structures, automatic storage management, dynamic typing, conditionals, higher-order functions, recursion, the self-hosting compiler, and

the read–eval–print loop.

The name LISP derives from "LISt Processor". Linked lists are one of Lisp's major data structures, and Lisp source code is made of lists. Thus, Lisp programs can manipulate source code as a data structure, giving rise to the macro systems that allow programmers to create new syntax or new domain-specific languages embedded in Lisp.

The interchangeability of code and data gives Lisp its instantly recognizable syntax. All program code is written as s-expressions, or parenthesized lists. A function call or syntactic form is written as a list with the function or operator's name first, and the arguments following; for instance, a function *f* that takes three arguments would be called as (*f* *arg1* *arg2* *arg3*).

## Windows Mobile

*and was originally released as Pocket PC 2000. Microsoft introduced the Pocket PC keyboard-less PDAs in 2000, with Pocket PC 2000 being the software. It*

Windows Mobile is a discontinued mobile operating system developed by Microsoft for smartphones and personal digital assistants (PDA). Designed to be the portable equivalent of the Windows desktop OS in the emerging mobile/portable area, the operating system is built on top of Windows CE (later known as Windows Embedded Compact) and was originally released as Pocket PC 2000.

Microsoft introduced the Pocket PC keyboard-less PDAs in 2000, with Pocket PC 2000 being the software. It was based on version 3.0 of Windows CE, the operating system originally developed for the Handheld PC in 1996. The next versions were Pocket PC 2002 and Smartphone 2002, the latter of which would power a new category of keypad-based cell phone devices named Smartphone. With the release of Windows Mobile 2003, the software was rebranded to a single "Windows Mobile" for both Pocket PCs and Smartphones, and to connect the brand with its desktop counterpart. Support for SH-3 and MIPS processor architectures were dropped, focusing only on ARM. In the next major release, Windows Mobile 5.0 in 2005, Microsoft unified the separate developments of Pocket PC and Smartphone software into a single Windows Mobile codebase. Data could be synchronized with desktops using ActiveSync software, and later using Windows Mobile Device Center.

Windows Mobile 6.0 and 6.1 were the next major releases, in 2007 and 2008 respectively, by which time the hardware devices were also solely under the Windows Mobile banner. Along with the final major release, Windows Mobile 6.5, the first to be designed for use without a stylus on touchscreens, Microsoft also introduced the Windows Marketplace for Mobile for software distribution, for Windows Mobile 6.x devices. Following the success of newer mobile operating systems like iOS, Windows Mobile faded rapidly; in 2010, Microsoft announced the more modern and consumer-focused Windows Phone 7 as its replacement, and Windows Mobile has been deprecated since existing devices and software are incompatible with Windows Phone.

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