

# Top 10 Features in Oracle Database for Developers

Over the years\*

\*has features from 10g onwards

# Oracle 10g (had R1 and R2)

## 'g' stands for grid, released in 2003

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- Automatic Storage Management (ASM): Simplifies the layout of data files, control files, and log files to optimize performance.
- Flashback Technology: Allows for point-in-time recovery and querying of data, providing a safety net against user errors and data corruptions.
- Data Pump: A faster, more flexible data movement utility compared to the traditional export/import tools.
- Regular Expression Support: Enhances searching capabilities within the database using complex pattern matching.
- SQL Model Clause: Introduces a new way to define multidimensional arrays and perform complex calculations.
- Recycle Bin: Permits the retrieval of dropped tables and their dependent objects until they are purged from the recycle bin.
- Automated Database Diagnostic Monitor (ADDM): Provides automated performance diagnostics and tuning recommendations.
- Grid Computing: Facilitates resource sharing and dynamic resource allocation across a grid of servers.
- Oracle Real Application Clusters (RAC): Enhances the scalability and availability of user applications.
- Server Manageability: Includes features like Automatic Workload Repository (AWR), Server-Generated Alerts, and Advisors for SQL Tuning.

# Oracle 11g (had R1 and R2)

## 'g' stands for grid, released in 2007

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- Enhancements to Regular Expression Built-in SQL Functions: New functions like REGEXP\_COUNT and enhancements to REGEXP\_INSTR and REGEXP\_SUBSTR.
- SIMPLE\_INTEGER Datatype: A subtype of PLS\_INTEGER that can increase the speed of integer arithmetic in natively compiled code.
- Sequences in PL/SQL Expressions: Allowed the use of sequences directly in PL/SQL expressions.
- Dynamic SQL Enhancements: Improvements in dynamic SQL capabilities for more flexible code.
- Generalized Invocation: Enhanced subprogram invocation with named and mixed notation.
- PL/SQL Native Compiler: Direct generation of native code from PL/SQL source code.
- New PL/SQL Compiler Warning (PLS-00436): Helps identify potential issues during compilation.
- Restriction in FORALL Statements Removed: More flexibility in writing bulk operations.
- Automatic Subprogram Inlining: Improves performance by automatically inlining subprograms.
- Trigger Enhancements: New capabilities for database triggers.

# Oracle 12c (had R1 and R2)

## ‘c’ stands for cloud, released in 2013

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- Increased Column Size Limits: The VARCHAR2, NVARCHAR2, and RAW data types allow for a larger number of characters than previous versions.
- JSON Support in the Database: Enhanced capabilities to store, process, and retrieve JSON data within the database.
- Lateral Clause for Inline Views: Allows the inclusion of columns from a subquery in the FROM clause.
- CROSS APPLY and OUTER APPLY Clauses: Enables joining a table to a row source returned by a subquery.
- New Optimization – Partial Join Evaluation: Improves performance by evaluating joins only when necessary.
- Cascading Truncate: Allows truncation of a parent table and its related child tables.
- Pluggable Databases: Facilitates the management of multiple databases as a single entity.
- Invisible Columns: Allows columns to be marked as invisible to applications and queries unless explicitly referenced.
- IDENTITY Columns: Simplifies the process of creating auto-incrementing columns for primary keys.
- Session Sequences: Provides session-specific sequences that do not require coordination across sessions.

# Oracle 18c

‘c’ stands for cloud, released in 2018

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This was an Innovation Release

# Oracle 19c

## ‘c’ stands for cloud, released in 2019

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- Automatic Indexing: AI-driven index management that optimizes performance without manual intervention.
- Active Data Guard DML Redirection: Allows DML operations on standby databases, redirecting changes to the primary database.
- SQL Quarantine: Prevents execution of resource-intensive SQL statements to maintain system performance.
- Database In-Memory: Enhancements to in-memory capabilities for faster analytics and reporting.
- Data Guard Multi-Instance Redo Apply: Supports the In-Memory Column Store in RAC databases, improving performance.
- Private Temporary Tables: Enables session-specific temporary tables that are dropped after the session or transaction ends.
- Hybrid Partitioned Tables: Facilitates partitioning across on-premise and cloud storage, optimizing costs and performance.
- Real-Time Statistics: Provides up-to-date statistics for the optimizer during DML operations.
- JSON Data Guide: Improves handling and querying of JSON data within the database.
- Blockchain Tables: Offers tamper-resistant and immutable tables for secure operations.

# Oracle 21c

'c' stands for cloud, released in 2021

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This was an Innovation Release

# Oracle 23ai

‘ai’ stands for artificial intelligence, released in 2023

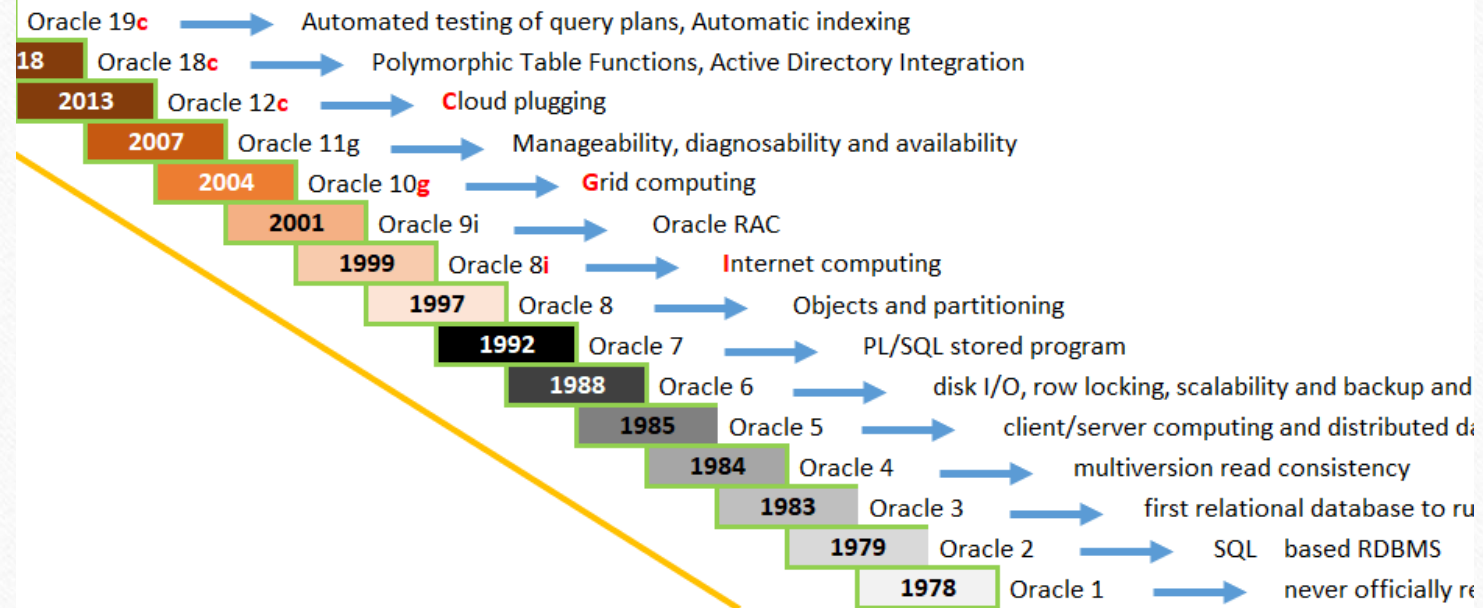
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- Wide Tables: Now supports up to 4,096 columns in a table, which can simplify application design for certain workloads.
- Transparent Application Continuity: Protects applications from outages at various layers, ensuring zero downtime for database clients.
- Automatic Transaction Rollback: Assigns priorities to transactions and automatically rolls back lower-priority transactions if they block higher-priority ones beyond a set timeout.
- Aliases in GROUP BY Clause: Introduces the ability to use aliases in the GROUP BY clause of a SELECT statement.
- FROM Clause - Now Optional: Simplifies SQL queries by making the FROM clause optional where applicable.
- Boolean for SQL: Adds native Boolean data type support for SQL, enhancing logical operations within the database.
- IF [NOT] EXISTS DDL Clause: Provides a new DDL clause to check the existence of database objects before attempting to create or drop them.
- New Table Value Constructor: Allows the creation of table values within a SELECT statement, improving data manipulation capabilities.
- Multivalue INSERTs: Enables inserting multiple values with a single INSERT statement, increasing efficiency for batch operations.
- RETURNING Clause of UPDATE and MERGE Statement: Enhances the RETURNING clause to provide more flexibility in retrieving data after DML operations.



# History of Oracle at a glance

## History of Oracle Database Versions



# Sources

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[Search Engine](#)

[Oracle Database Documentation](#)

[Oracle Base](#)

# Thanks

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