

# Benchmark

## TPC-H 100



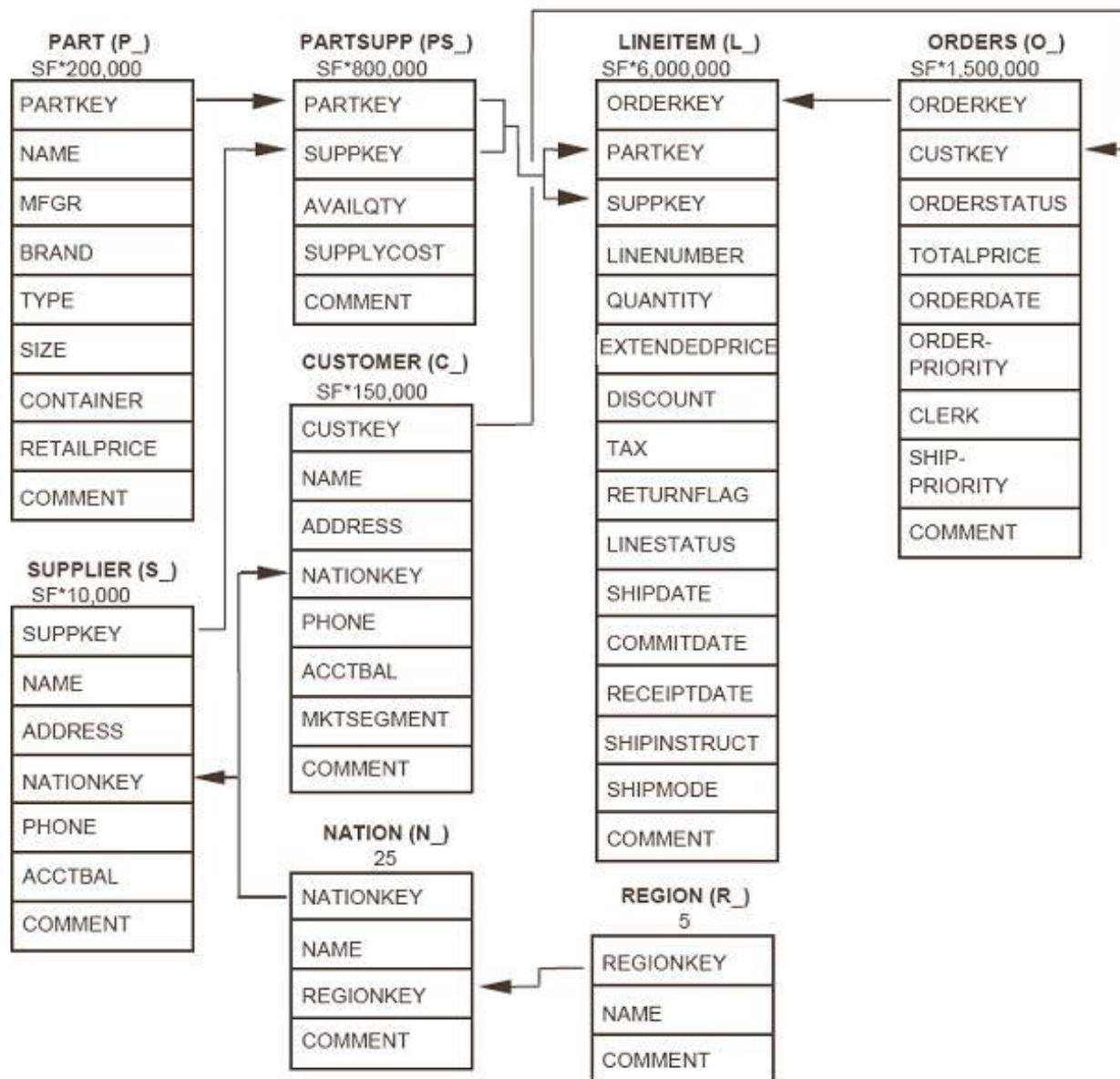
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**Transaction Processing Performance Council (TPC)** is a non-profit organization founded in 1988 to define transaction processing and database benchmarks and to disseminate objective, verifiable TPC performance data to the industry. TPC benchmarks are widely used today in evaluating the performance of computer systems.

**The TPC Benchmark™ H (TPC-H)** is a decision support benchmark. It consists of a suite of business oriented ad-hoc queries and concurrent data modifications. The queries and the data populating the database have been chosen to have broad industry-wide relevance. This benchmark illustrates decision support systems that examine large volumes of data, execute queries with a high degree of complexity, and give answers to critical business questions.

Item	Value
<b>OS Name</b>	Microsoft(R) Windows(R) Server 2003 Standard x64 Edition R2
<b>Version</b>	5.2.3790 Service Pack 2 Build 3790
<b>System Manufacturer</b>	Dell Inc.
<b>System Model</b>	PowerEdge 1950
<b>System Type</b>	x64-based PC
<b>Processor 4x</b>	EM64T Family 6 Model 23 Stepping 6 GenuineIntel ~2328Mhz
<b>Total Physical Memory</b>	8.186,64 MB
<b>HARD DISK</b>	DELL PERC 6/i SCSI Disk Device 464,50 GB

# TPC-H DATABASE SCHEMA



The database is populated using **DBGEN** program (database population generator).

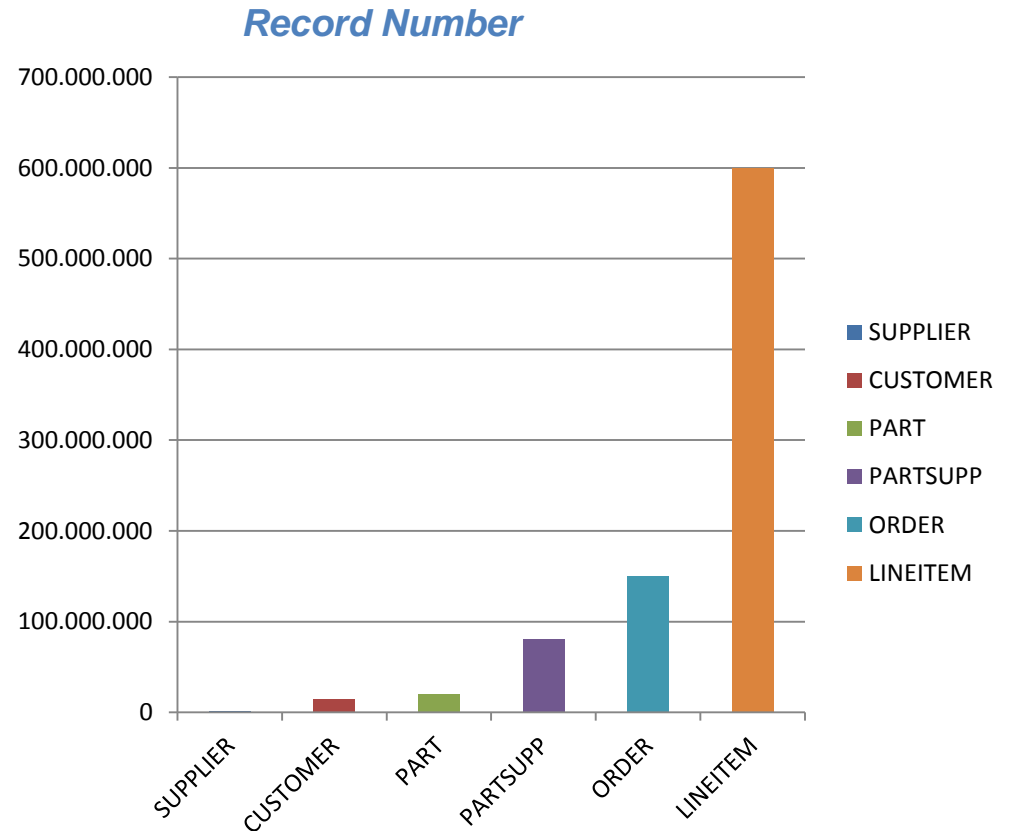
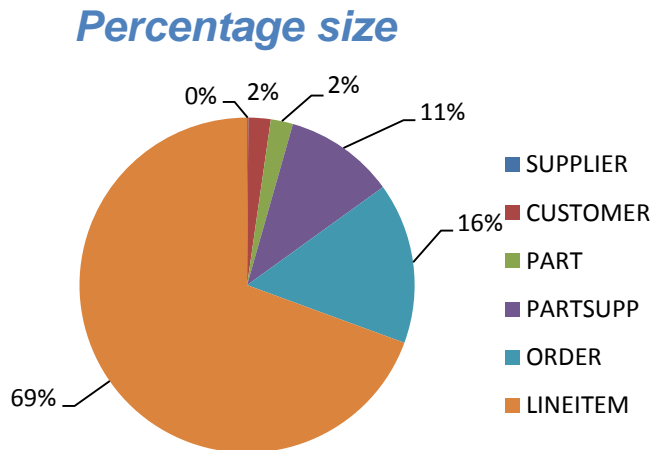
The TPC-H allows to choose the database size by defining the scale factor (SF).

In the following test **SF=100** has been used.

The following table indicates the Cardinality and the Size of input file.

## Scale Factor =100

Table	Cardinality	Size INPUT (bytes)
SUPPLIER	1.000.000	143.891.134
CUSTOMER	15.000.000	2.478.868.830
PART	20.000.000	2.480.630.582
PARTSUPP	80.000.000	12.289.118.366
ORDER	150.000.000	17.943.515.672
LINEITEM	600.037.902	80.180.029.491
TOTALE		115.516.058.732

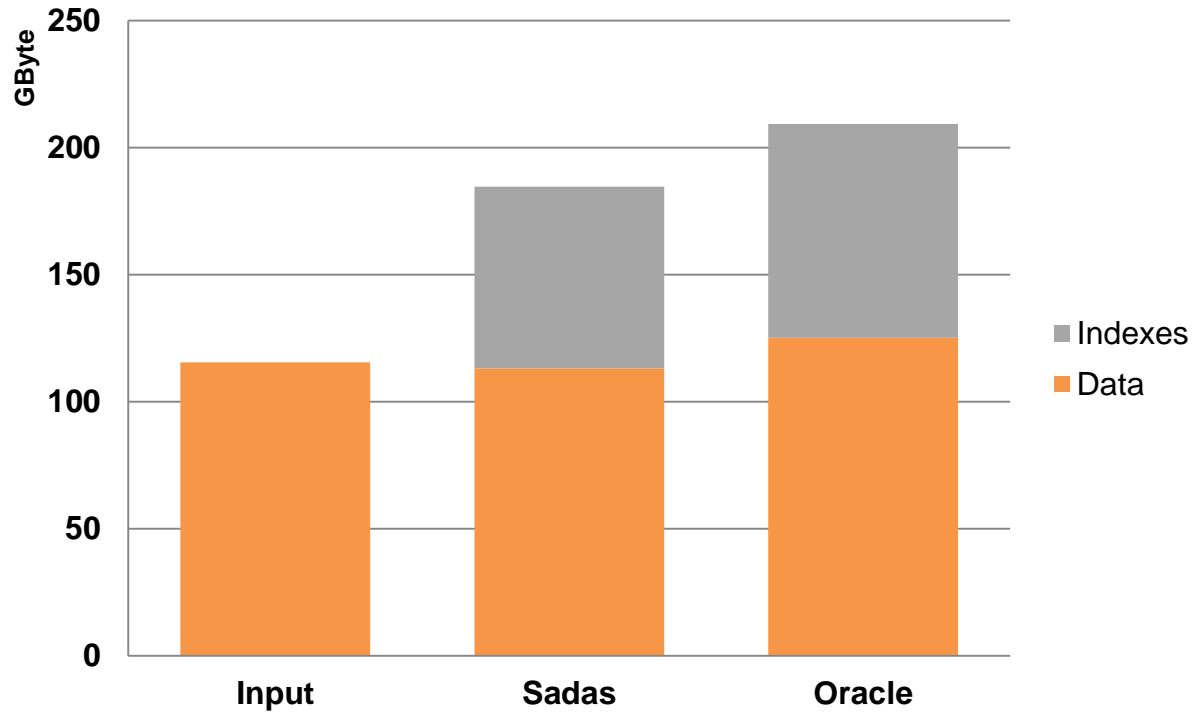


# Storage Space

## Storage space (bytes)

	Input	Sadas	Oracle	Ratio
Data	115.516.058.732	113.104.441.529	125.183.810.000	1,11
Indexes		71.501.859.878	84.160.390.000	1,18
Total	115.516.058.732	184.606.301.407	209.344.200.000	1,13

## Storage space

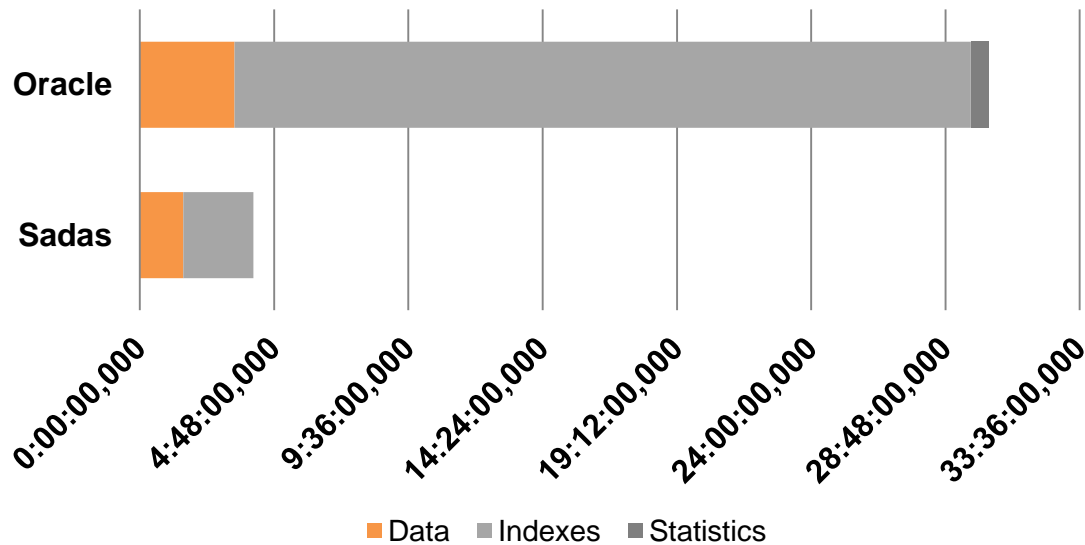


# Loading Times

*Loading times (hh.mm.ss,xxx)*

	Sadas	Oracle	Ratio
Data	01.33.04,501	03.23.25,390	2,19
Indexes	02.30.54,062	26.19.03,189	10,46
Statistics		00.38.08,000	
	04.03.58,563	30.20.36,579	7,46

*Loading times (hh.mm.ss,xxx)*



## Sadas Engine

In Sadas Engine the indexes are created automatically for all attributes and the join-Index for all foreign keys.

For fields Comment indexes are created only where needed (Group by clause, Where clause or join).

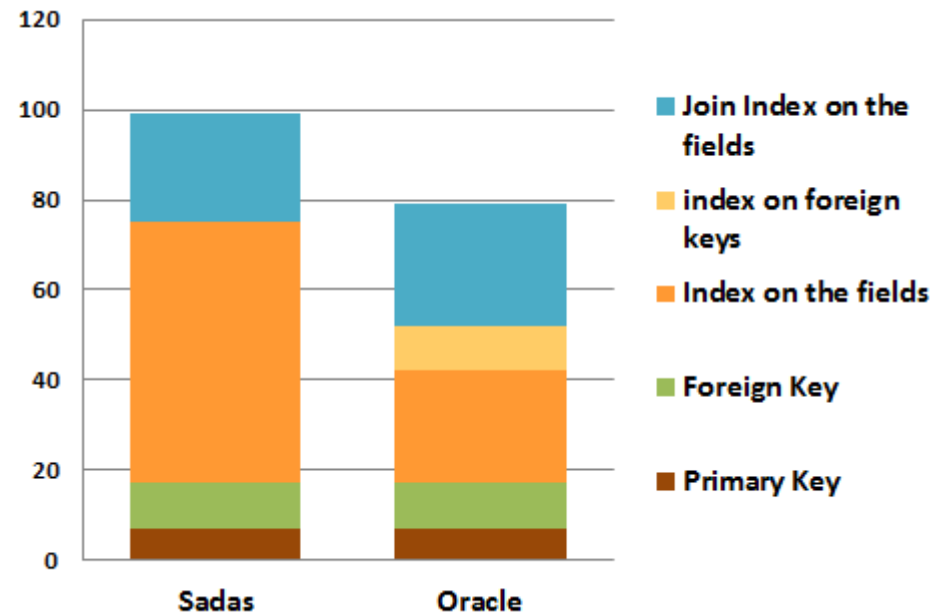
### Indexes

Index	Sadas	Oracle
Primary Key	7	7
Foreign Key	10	10
Index on the fields	58	25
Index on foreign keys		10
Join Index on the fields	24	27
Total	99	79

## Oracle

To optimize the performance of Oracle 79 indexes are created (primary keys, foreign keys and join index)

### Indexes





# Query processing time



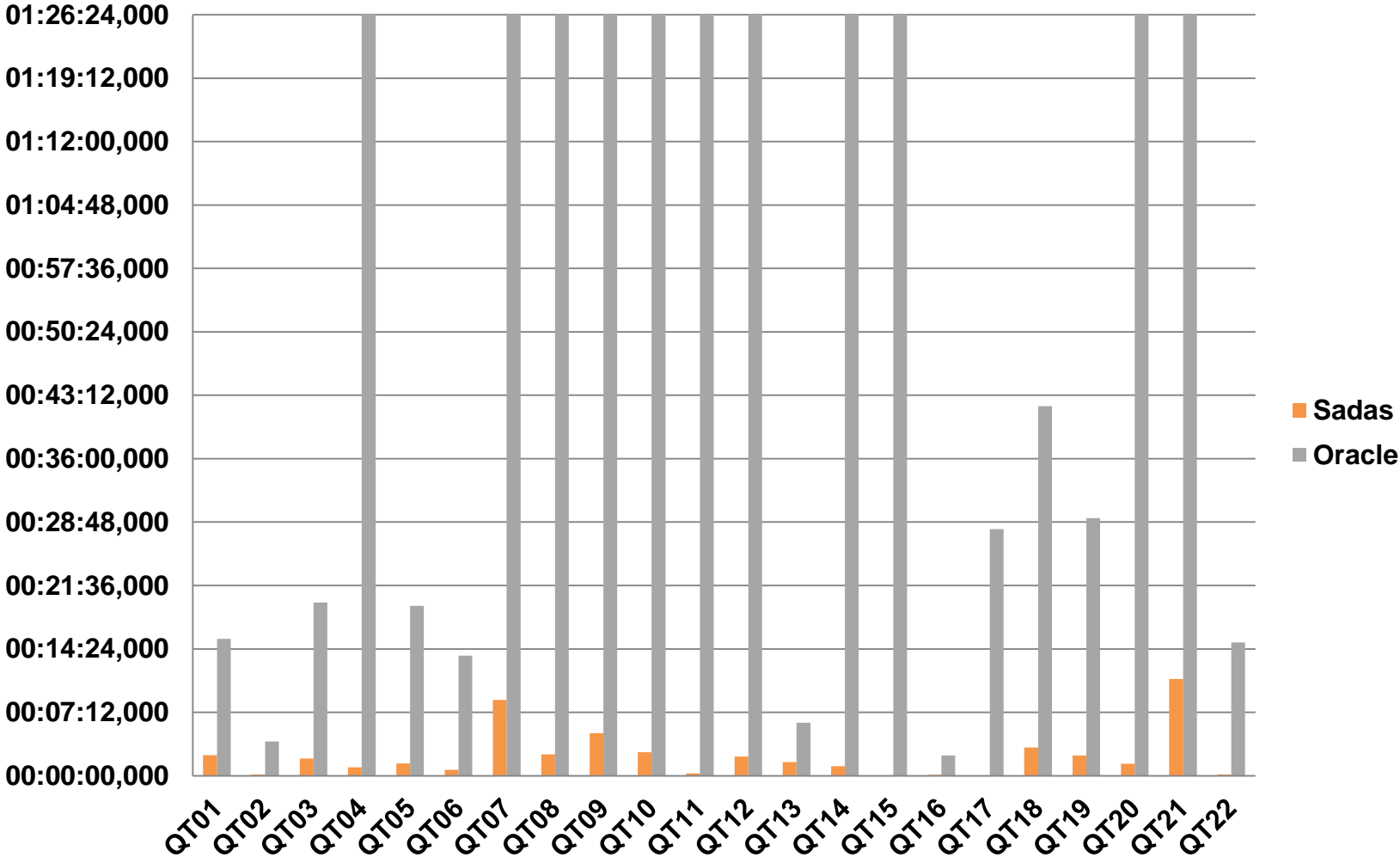
Query	Sadas	Oracle	Ratio	Description
QT01	0.02.20,188	0.15.32,734	6,6535	1 TABLE, 1 CONSTRAINT, 5 AGGREGATE
QT02	0.00.07,922	0.03.52,984	29,41	5 TABLE, 4 JOIN, 3 CONSTRAINT, 1 AGGREGATE
QT03	0.01.57,563	0.19.39,672	10,034	3 TABLE, 2 JOIN, 3 CONSTRAINT, 1 AGGREGATE
QT04	0.00.56,922	5.50.07,422	369,06	2 TABLE, 1 JOIN, 3 CONSTRAINT, 1 AGGREGATE
QT05	0.01.23,016	0.19.16,719	13,934	5 TABLE, 4 JOIN, 3 CONSTRAINT, 1 AGGREGATE
QT06	0.00.40,200	0.13.38,078	20,364	1 TABLE, 4 CONSTRAINT, 1 AGGREGATE
QT07**	0.08.36,200	<b>More than 1 day</b>		6 TABLE, 5 JOIN, 5 CONSTRAINT, 1 AGGREGATE
QT08**	0.02.25,500	<b>More than 1 day</b>		7 TABLE, 6 JOIN, 3 CONSTRAINT, 2 AGGREGATE
QT09**	0.04.49,700	<b>More than 1 day</b>		6 TABLE, 5 JOIN, 1 CONSTRAINT, 1 AGGREGATE
QT10	0.02.39,800	4.42.20,203	106,02	4 TABLE, 3 JOIN, 3 CONSTRAINT, 1 AGGREGATE
QT11*	0.00.15,900	3.36.23,782	815,46	3 TABLE, 2 JOIN, 1 CONSTRAINT, 1 AGGREGATE
QT12	0.02.10,600	4.48.09,031	132,37	2 TABLE, 1 JOIN, 5 CONSTRAINT, 2 AGGREGATE
QT13**	0.01.33,000	0.06.00,641	3,88	2 TABLE, 1 JOIN, 1 CONSTRAINT, 2 AGGREGATE
QT14	0.01.05,300	7.15.07,281	399,82	2 TABLE, 1 JOIN, 2 CONSTRAINT, 2 AGGREGATE
QT15*	0.00.02,900	<b>More than 1 day</b>		2 TABLE, 1 JOIN, 3 CONSTRAINT, 2 AGGREGATE
QT16**	0.00.06,300	0.02.18,672	22,08	3 TABLE, 2 JOIN, 4 CONSTRAINT, 1 AGGREGATE
QT17**	0.00.00,400	0.27.59,937	3980,9	2 TABLE, 1 JOIN, 4 CONSTRAINT, 2 AGGREGATE
QT18*	0.03.11,500	0.41.57,734	13,15	3 TABLE, 3 JOIN, 2 AGGREGATE
QT19	0.02.18,000	0.29.14,375	12,71	UNION 3 SELECT,EACH WITH: 2 TABLE, 1 JOIN, 7 CONSTRAINT, 1 AGGREGATE 3
QT20**	0.01.22,100	5.35.27,500	245,2	5 TABLE, 3 JOIN, 5 CONSTRAINT, 1 AGGREGATE
QT21*	0.10.59,700	22.17.49,504	121,67	4 TABLE, 3 JOIN, 4 CONSTRAINT, 1 AGGREGATE
QT22**	0.00.09,000	0.15.08,422	100,76	2 TABLE 1 JOIN, 2 CONSTRAINT, 3 AGGREGATE
<b>Total***</b>	<b>0.33.17,378</b>	<b>57.20.04,691</b>	<b>103,3</b>	

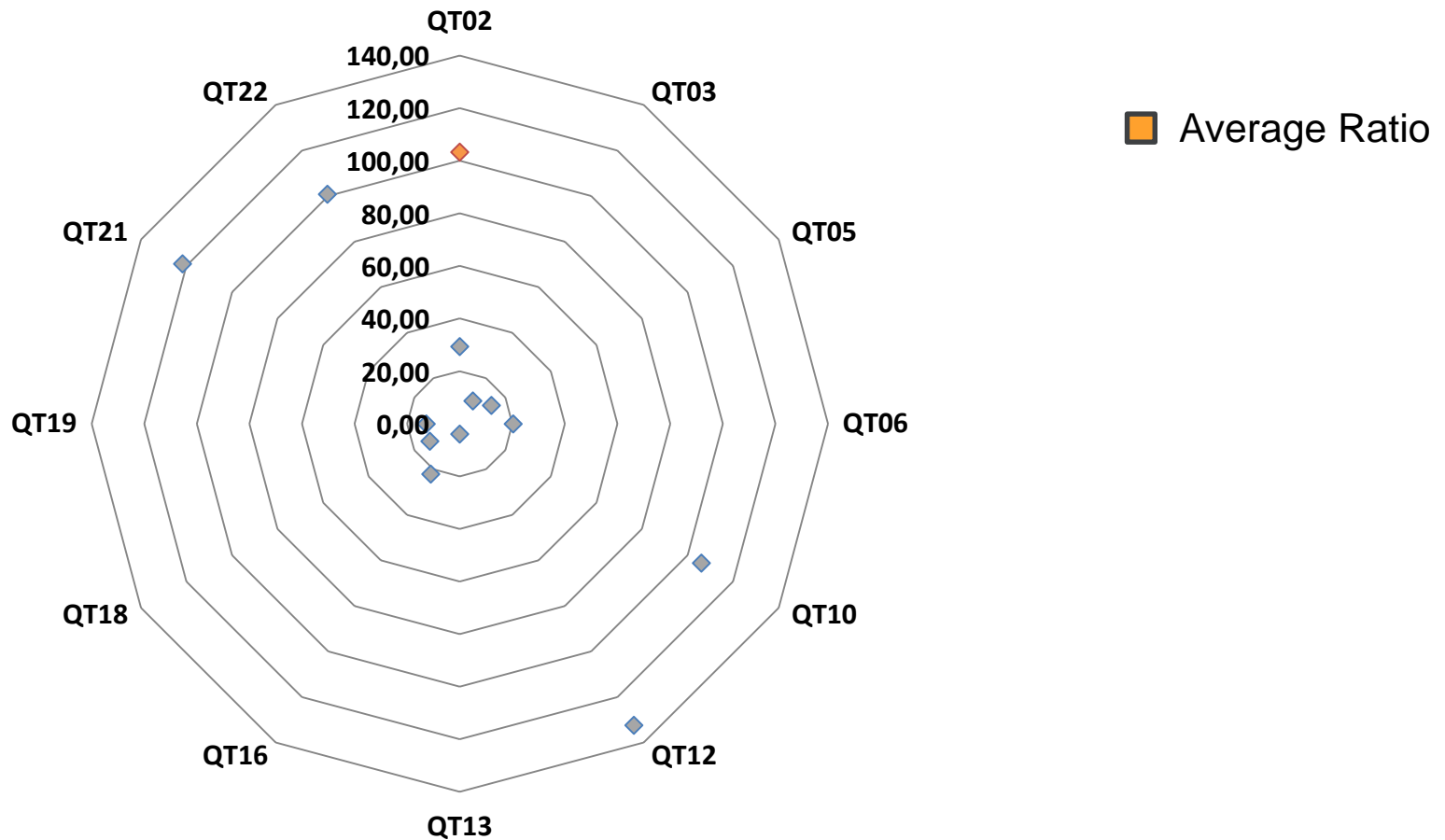
NB. The Total does not consider the queries for which Oracle takes more than 1 day.

# Query processing time



Query processing time (hh.mm.ss,xxx)





NB. The Average Ratio does not consider the queries for which Oracle takes more than 1 day.



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