BD - Lab 1

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Overview

Evaluare Laborator

Structura pe saptamani:

- 10/11 sapt. laboratoare
- 1 sapt. colocviu
- restul sapt. sunt pt recuperare (se recupereaza doar prezenta)

Structura punctajului pe laborator:

- 10% prezenta laboratoare
- 40% media obtinuta la activitatea pe laborator
- 50% colocviu laborator

Conditii promovare:

- minim 7 prezente laborator pt a intra in examen
- minim 50% punctajul pe laborator
- minim 50% punctajul pe colocviu

Activitate Laborator

Structura notelor:

Lab	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	*L11
Nota	P	P	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	N_{11}

Nota laborator:

$$Nota_{laborator} = 0.2 * Punctaj_{exercitii} * 0.8 * Punctaj_{test} \quad (1)$$

Reguli notare:

- se puncteaza doar laboratoarele unde se da test
- primele doua laboratoare nu se puncteaza

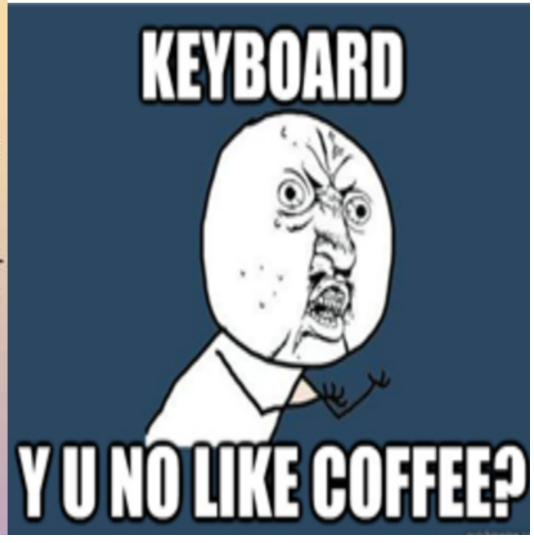
Nota finala:

$$Nota_{finala\ activitate\ laborator} = \frac{\sum_{i=3}^{i=11} N_i}{\#N_i}, \forall N_i \neq P \quad (2)$$

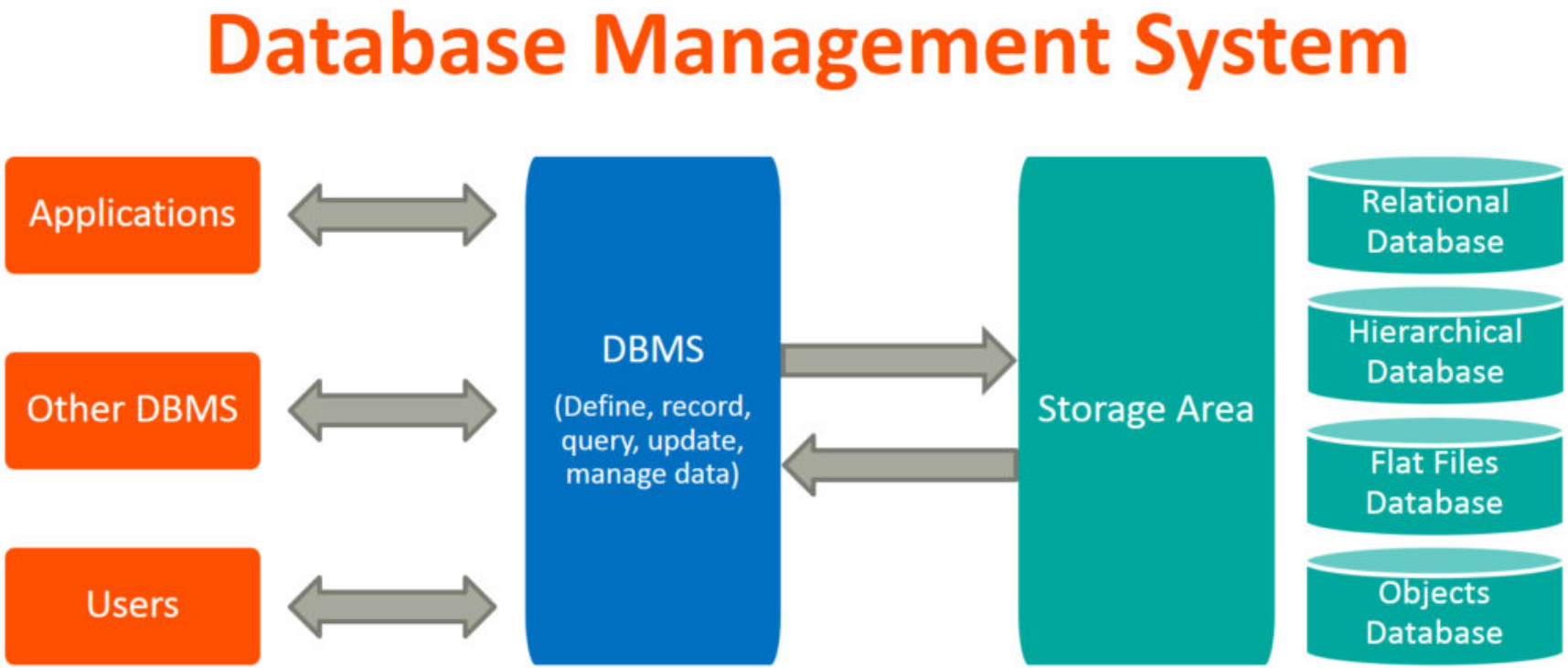
Reguli

DO's

DONT's

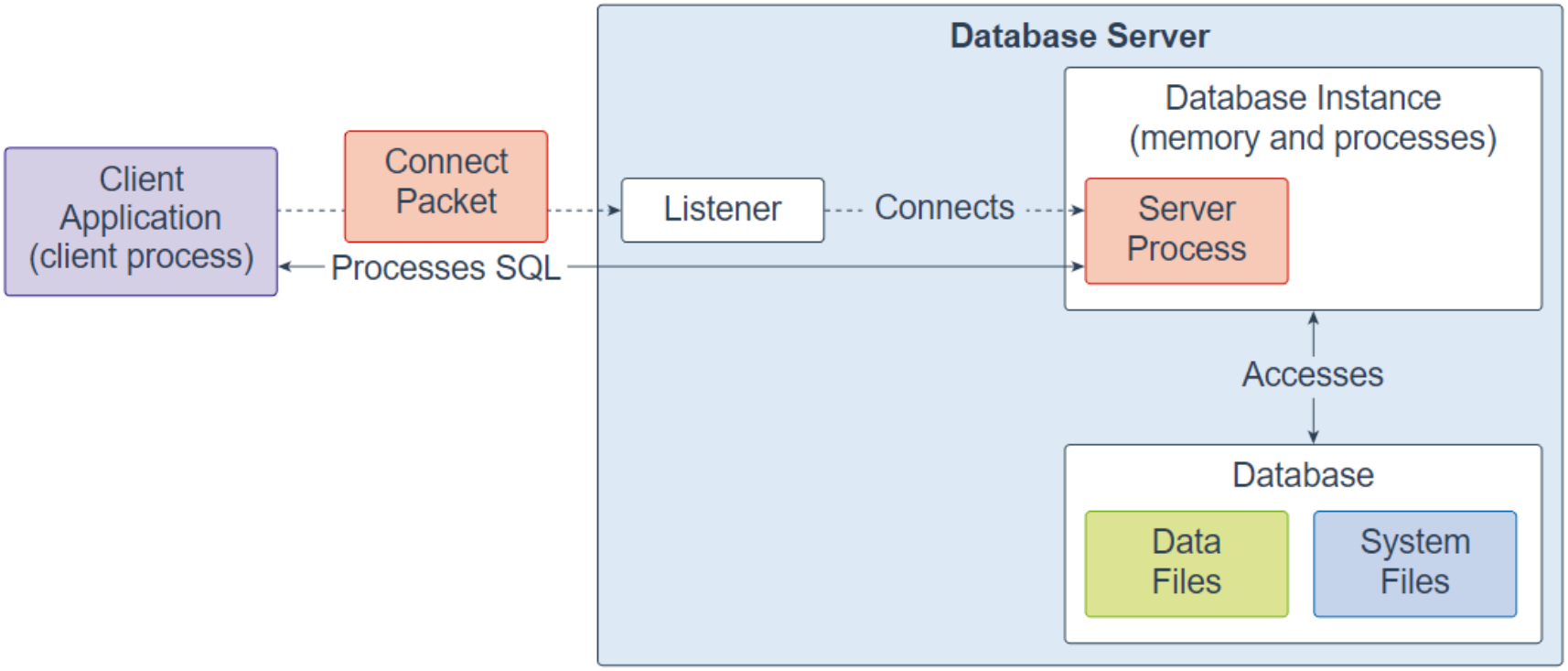


Diferenta intre BD si SGBD



[1] https://www.bmc.com/blogs/dbms-database-management-systems/

Logica Componentelor



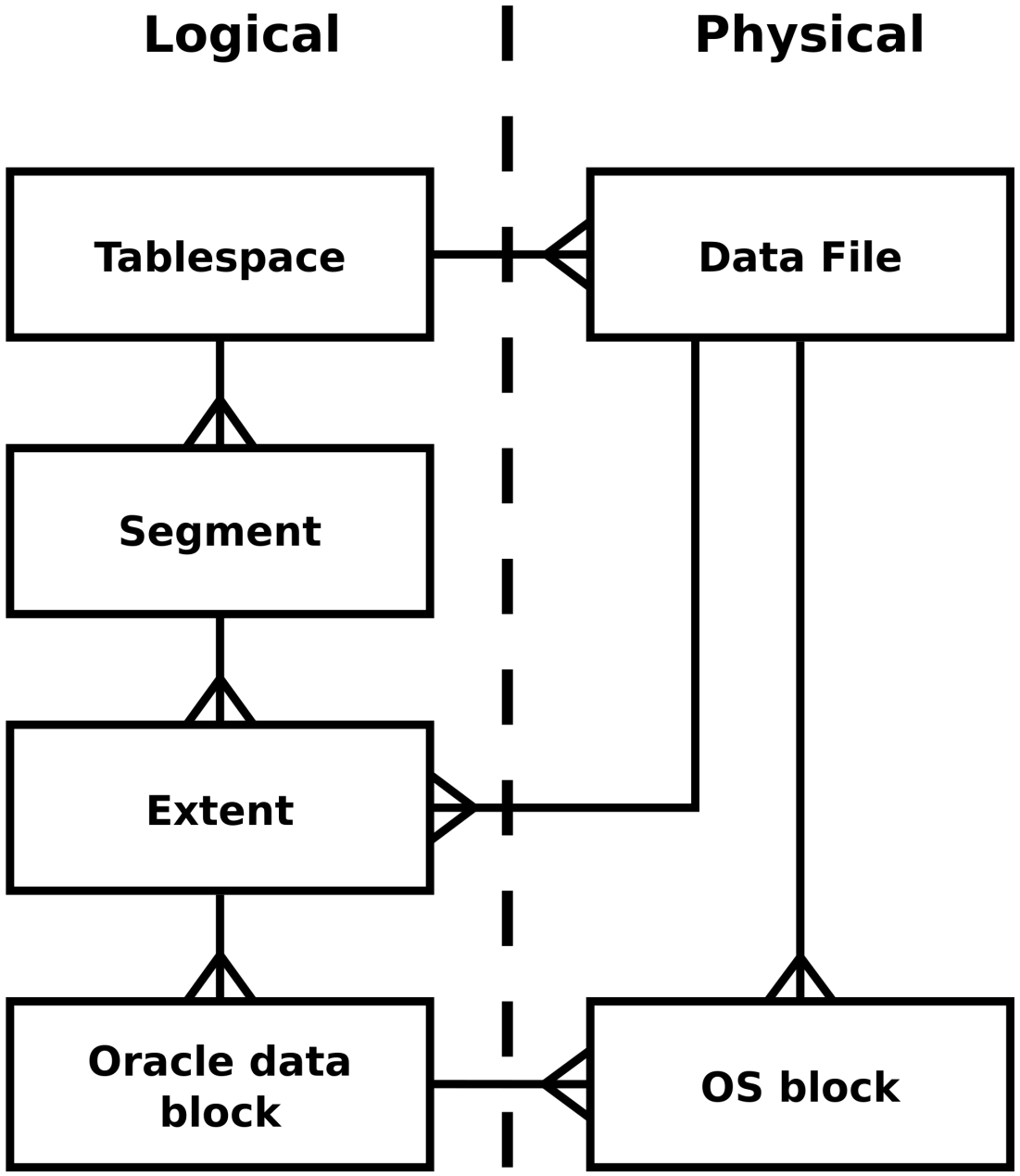
SGBD

- Relationale:
  - Oracle
  - Microsoft SQL Server
  - IBM DB2
  - MySQL
  - PostgreSQL
- NoSQL:
  - Orientate document(Document-oriented Database): MongoDB, Apache CouchDB
  - Graf(Graph Database): Neo4J
  - Cheie-valoare (Key-Value Database): Riak, Redis
  - Orientate obiect(Object database): Cach, ObjectDB
  - Orientate coloana(Column-oriented Database): Apache HBase, Cassandra

Oracle SQL

- paradigme programare:
  - declarativ: SQL
  - procedural + declarativ: PL/SQL
- are urmatoarele comenzi, grupate n 4 categorii:
  - Data Manipulation Language (DML): SELECT, INSERT, UPDATE, DELETE, MERGE
  - Data Definition Language (DDL): CREATE, ALTER, DROP, RENAME, TRUNCATE, COMMENT
  - Data Control Language (DCL): GRANT, REVOKE
  - Transaction Control Language (TCL): COMMIT, ROLLBACK, SAVEPOINT

BD - Structura

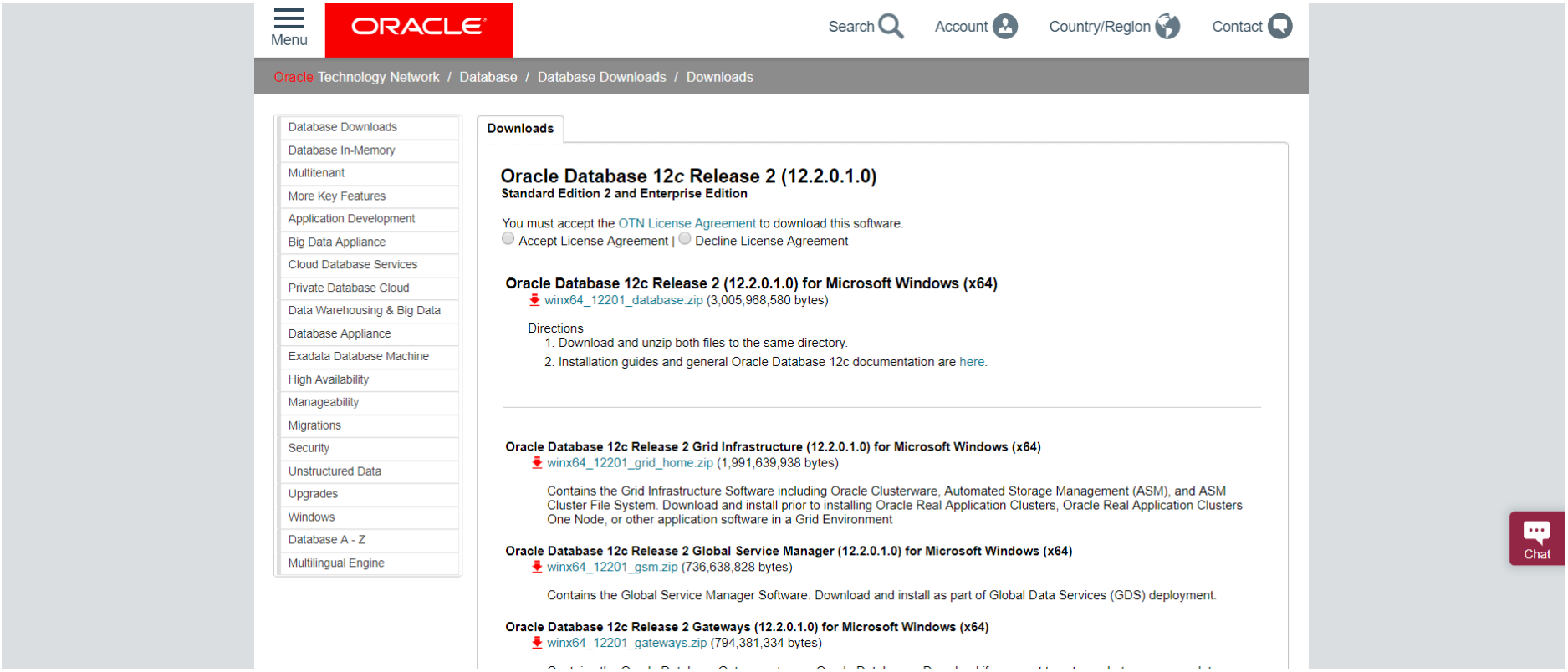


SQLPlus

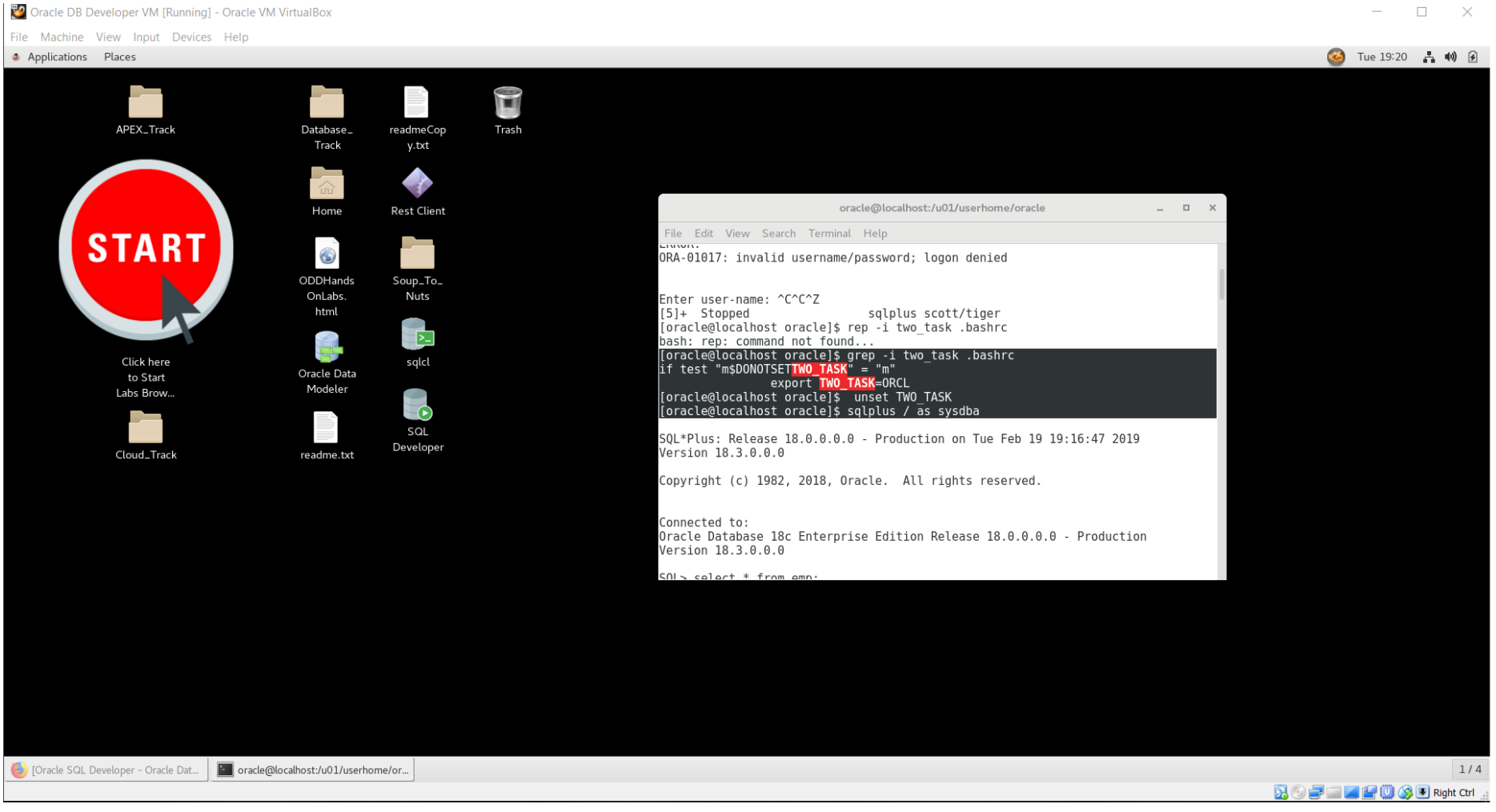
- interpretor in linie de comanda
- expune mai multe functionalitati:
  - comenzi SQL
  - proceduri PL/SQL
  - comenzi interne(e.g **help index**)
  - comenzi externe e.g **!pwd**)

Unboxing Oracle

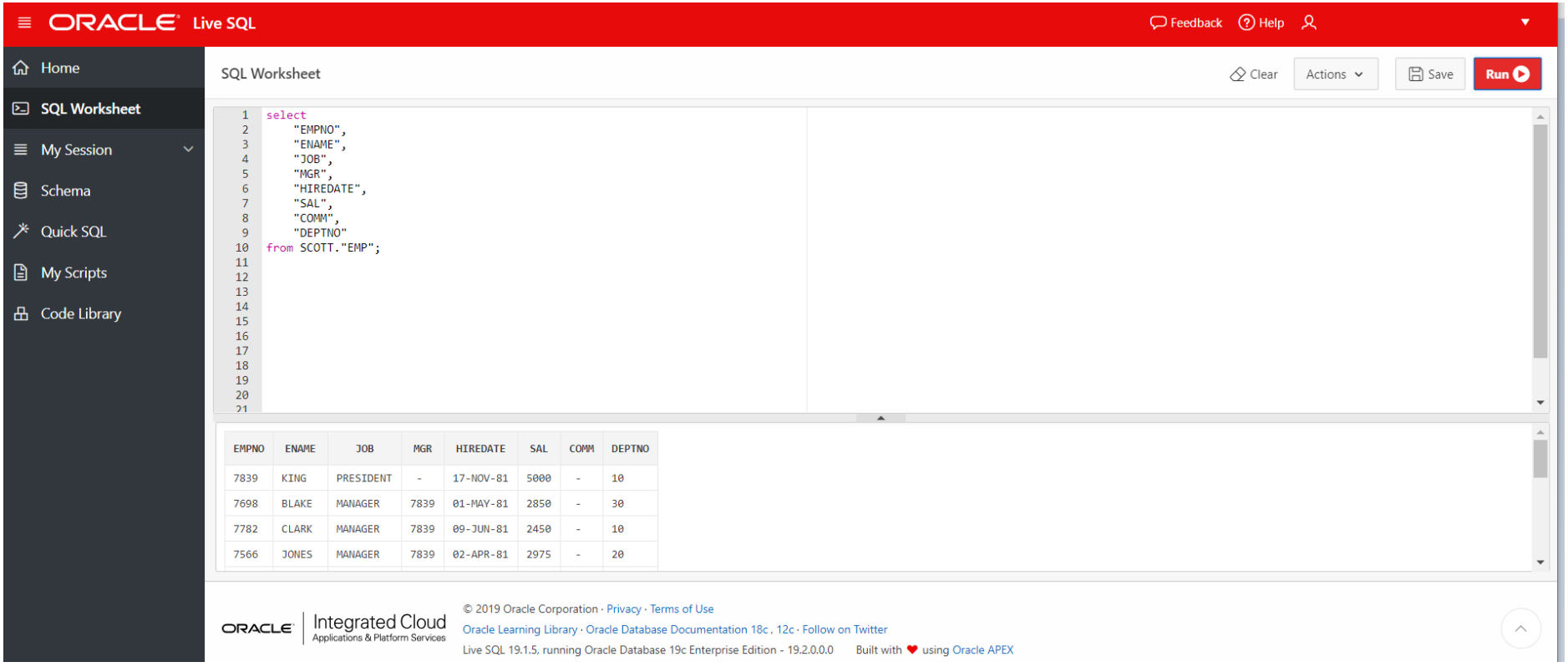
Raw Install


Menu
ORACLE
Search
Account
Country/Region
Contact
Oracle Technology Network / Database / Database Downloads / Downloads
Database Downloads
Database In-Memory
Multitenant
More Key Features
Application Development
Big Data Appliance
Cloud Database Services
Private Database Cloud
Data Warehousing & Big Data
Database Appliance
Exadata Database Machine
High Availability
Manageability
Migrations
Security
Unstructured Data
Upgrades
Windows
Database A - Z
Multilingual Engine
Downloads
Oracle Database 12c Release 2 (12.2.0.1.0)
Standard Edition 2 and Enterprise Edition
You must accept the OTN License Agreement to download this software.
Accept License Agreement | Decline License Agreement
Oracle Database 12c Release 2 (12.2.0.1.0) for Microsoft Windows (x64)
winx64_12201_database.zip (3,005,968,580 bytes)
Directions
1. Download and unzip both files to the same directory.
2. Installation guides and general Oracle Database 12c documentation are here.
Oracle Database 12c Release 2 Grid Infrastructure (12.2.0.1.0) for Microsoft Windows (x64)
winx64_12201_grid_home.zip (1,991,639,938 bytes)
Contains the Grid Infrastructure Software including Oracle Clusterware, Automated Storage Management (ASM), and ASM Cluster File System. Download and install prior to installing Oracle Real Application Clusters, Oracle Real Application Clusters One Node, or other application software in a Grid Environment
Oracle Database 12c Release 2 Global Service Manager (12.2.0.1.0) for Microsoft Windows (x64)
winx64_12201_gsm.zip (736,638,828 bytes)
Contains the Global Service Manager Software. Download and install as part of Global Data Services (GDS) deployment.
Oracle Database 12c Release 2 Gateways (12.2.0.1.0) for Microsoft Windows (x64)
winx64_12201_gateways.zip (794,381,334 bytes)
Chat

Pre-built VM


Oracle DB Developer VM [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places
Tue 19:20
APEX_Track
Database_ Track
readmeCop y.txt
Trash
Home
Rest Client
START
ODDHands OnLabs. html
Soup_To_ Nuts
Click here to Start Labs Brow...
Oracle Data Modeler
sqlcl
Cloud_Track
readme.txt
SQL Developer
oracle@localhost:/u01/userhome/oracle
File Edit View Search Terminal Help
ORA-01017: invalid username/password; logon denied
Enter user-name: ^C^C^Z
[5]+ Stopped sqlplus scott/tiger
[oracle@localhost oracle]$ rep -i two_task .bashrc
bash: rep: command not found...
[oracle@localhost oracle]$ grep -i two_task .bashrc
if test "m$DONOTSETTWO_TASK" = "m"
export TWO_TASK=ORCL
[oracle@localhost oracle]$ unset TWO_TASK
[oracle@localhost oracle]$ sqlplus / as sysdba
SQL*Plus: Release 18.0.0.0.0 - Production on Tue Feb 19 19:16:47 2019
Version 18.3.0.0.0
Copyright (c) 1982, 2018, Oracle. All rights reserved.
Connected to:
Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 - Production
Version 18.3.0.0.0
[Oracle SQL Developer - Oracle Dat...
oracle@localhost:/u01/userhome/or...
1 / 4
Right Ctrl

LiveSQL


ORACLE Live SQL
Feedback
Help
Home
SQL Worksheet
My Session
Schema
Quick SQL
My Scripts
Code Library
SQL Worksheet
Clear
Actions
Save
Run
select
"EMPNO",
"ENAME",
"JOB",
"MGR",
"HIREDATE",
"SAL",
"COMM",
"DEPTNO"
from SCOTT."EMP";
EMPNO ENAME JOB MGR HIREDATE SAL COMM DEPTNO
7839 KING PRESIDENT - 17-NOV-81 5000 - 10
7698 BLAKE MANAGER 7839 01-MAY-81 2850 - 30
7782 CLARK MANAGER 7839 09-JUN-81 2450 - 10
7566 JONES MANAGER 7839 02-APR-81 2975 - 20
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Live SQL 19.1.5, running Oracle Database 19c Enterprise Edition - 19.2.0.0.0
Built with using Oracle APEX

Algebra Relationala

- frameword teoretic pt. modelarea si interogarea datelor intr-o tabela
- publicat in paper-ul “A Relational Model of Data for Large Shared Data Banks“, E. F. Codd, 1970
- are la baza urmatoarele primitve:
  - proiectia
  - selectia
  - produsul cartezian
  - reuniune
  - intersectia

Proiectia(π)

- operatia care afiseaza selectiv anumite coloane din una sau mai multe tabele
- ex. $\pi_{Artist,Genre}(SONGS)$

SONGS			
SongID	**Title**	**Artist**	**Genre**
1	Lacrimosa	Mozart	Classic
2	Under Pressure	Queen	Rock
3	Billie Jean	Michael Jackson	Pop
4	I Want to Break Free	Queen	Rock

Artist	**Genre**
Mozart	Classic
Queen	Rock
Michael Jackson	Pop
Queen	Rock

Slectia sau Restrictia(σ)

- este operatia care preia si afiseaza toate liniile(sau liniile care indeplinesc anumite una sau mai multe conditii) din una sau mai multe tabele
- ex. $\sigma_{Genre=Rock}(SONGS)$

SONGS			
SongID	**Title**	**Artist**	**Genre**
1	Lacrimosa	Mozart	Classic
2	Under Pressure	Queen	Rock
3	Billie Jean	Michael Jackson	Pop
4	I Want to Break Free	Queen	Rock

SongID	**Title**	**Artist**	**Genre**
2	Under Pressure	Queen	Rock
4	I Want to Break Free	Queen	Rock

Produsul($\times$)

- este operatia care preia si afiseaza toate liniile(sau liniile care indeplinesc una sau mai multe conditii) din una sau mai multe tabele
- ex. USERS$\times$SONGS

SONGS			
SongID	**Title**	**Artist**	**Genre**
1	Lacrimosa	Mozart	Classic
2	Under Pressure	Queen	Rock
3	Billie Jean	Michael Jackson	Pop
4	I Want to Break Free	Queen	Rock

USERS	
UserId	**Name**
77	Dorel
99	Gigel

UserId	Name	SongID	Title	Artist	Genre
77	Dorel	1	Lacrimosa	Mozart	Classic
77	Dorel	2	Under Pressure	Queen	Rock
77	Dorel	3	Billie Jean	Michael Jackson	Pop
77	Dorel	4	I Want to Break Free	Queen	Rock
99	Gigel	1	Lacrimosa	Mozart	Classic
99	Gigel	2	Under Pressure	Queen	Rock
99	Gigel	3	Billie Jean	Michael Jackson	Pop
99	Gigel	4	I Want to Break Free	Queen	Rock

Reuniunea($\cup$)

- este rezultatul obtinut prin afisarea liniilor comune si neconume dintre doua sau mai multe tabele
- ex. $\pi_{Title,Artist,Genre}(SONGS\_T1) \cup \pi_{Title,Artist,Genre}(SONGS\_T2)$

SONGS_T1			
SongID	**Title**	**Artist**	**Genre**
1	Lacrimosa	Mozart	Classic
2	Under Pressure	Queen	Rock
3	Billie Jean	Michael Jackson	Pop
4	I Want to Break Free	Queen	Rock

SONGS_T2			
SongID	**Title**	**Artist**	**Genre**
5	Lacrimosa	Mozart	Classic
6	Dream On	Aerosmith	Blues Rock

Title	**Artist**	**Genre**
Lacrimosa	Mozart	Classic
Under Pressure	Queen	Rock
Billie Jean	Michael Jackson	Pop
I Want to Break Free	Queen	Rock
Lacrimosa	Mozart	Classic
Dream On	Aerosmith	Blues Rock

Intersectia($\cap$)

- este rezultatul obtinut prin afisarea liniilor comune dintre dou sau mai multe tabele
- ex. $\pi_{Title,Artist,Genre}(SONGS\_T1) \cap \pi_{Title,Artist,Genre}(SONGS\_T2)$

SONGS_T1			
SongID	**Title**	**Artist**	**Genre**
1	Lacrimosa	Mozart	Classic
2	Under Pressure	Queen	Rock
3	Billie Jean	Michael Jackson	Pop
4	I Want to Break Free	Queen	Rock

SONGS_T2			
SongID	**Title**	**Artist**	**Genre**
5	Lacrimosa	Mozart	Classic
6	Dream On	Aerosmith	Blues Rock

Title	**Artist**	**Genre**
Mozart	Classic	Lacrimosa

Diferenta(\)

- este rezultatul obtinut prin afisarea liniilor care apartin numai unei singure tabele conform conditiilor specificate
- ex. $\pi_{Title,Artist,Genre}(SONGS\_T1) \setminus \pi_{Title,Artist,Genre}(SONGS\_T2)$

SONGS_T1			
SongID	**Title**	**Artist**	**Genre**
1	Lacrimosa	Mozart	Classic
2	Under Pressure	Queen	Rock
3	Billie Jean	Michael Jackson	Pop
4	I Want to Break Free	Queen	Rock

SONGS_T2			
SongID	**Title**	**Artist**	**Genre**
5	Lacrimosa	Mozart	Classic
6	Dream On	Aerosmith	Blues Rock

Title	**Artist**	**Genre**
Under Pressure	Queen	Rock
Billie Jean	Michael Jackson	Pop
I Want to Break Free	Queen	Rock

Join

- este de fapt produsul cartezian pe care se aplica selectia
- exista mai multe tipuri de join
- ex. SONGS $\bowtie_{NaturalJoin}$ FOLDERS

SONGS				
SongID	**Title**	**Artist**	**Genre**	**FolderId**
1	Lacrimosa	Mozart	Classic	1
2	Under Pressure	Queen	Rock	2
3	Billie Jean	Michael Jackson	Pop	3
4	I Want to Break Free	Queen	Rock	2

FOLDERS	
FolderId	**Path**
1	~/music/classic_songs
2	~/music/rock_songs
3	~/music/pop_songs

SongID	Title	Artist	Genre	FolderId	Path
1	Lacrimosa	Mozart	Classic	1	~/music/classic_songs
2	Under Pressure	Queen	Rock	2	~/music/rock_songs
3	Billie Jean	Michael Jackson	Pop	3	~/music/pop_songs
4	I Want to Break Free	Queen	Rock	2	~/music/rock_songs

Hacking the Code

The End