

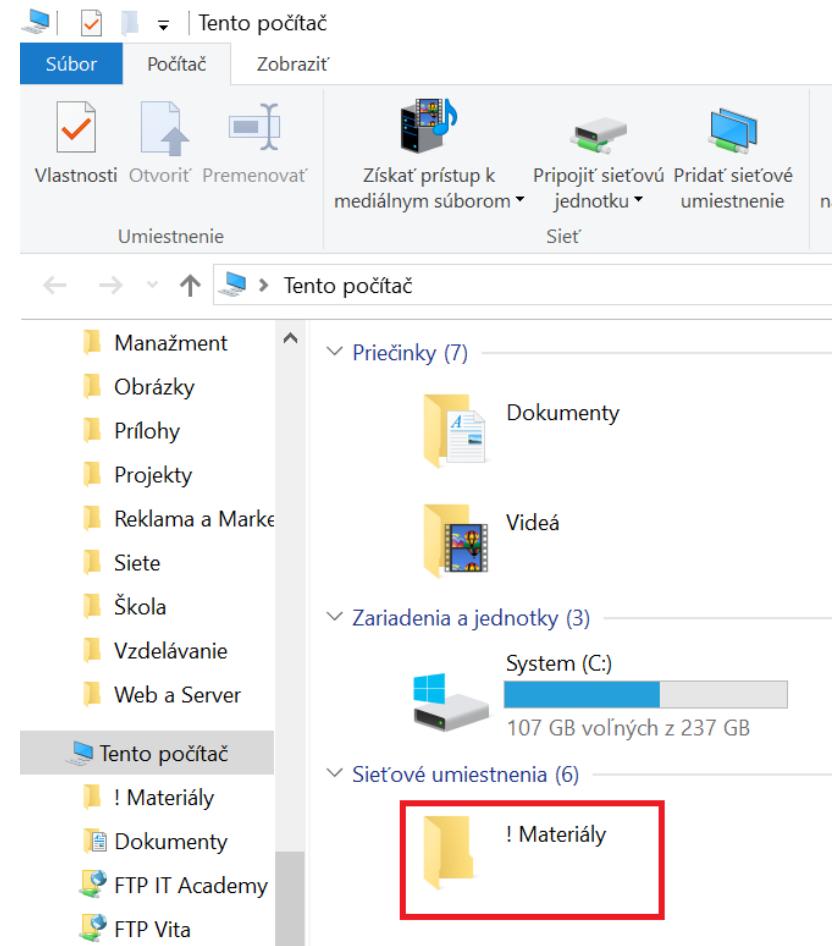
# Oracle PL/SQL

## I. Začiatočník



# Ako začneme?

1. Zapíš sa do prezenčky (ak chceš materiály a certifikát):
  - <https://www.it-academy.sk/prezencka/> (heslo: **GR271**)
2. Pridaj si ma na LinkedIn:
  - [www.linkedin.com/in/miroslav-reiter](https://www.linkedin.com/in/miroslav-reiter)
3. Stiahni si materiály:
  - <https://1drv.ms/u/s!AlrLrycbTQ1azIdcQQsmQRLBspwoRQ?e=C4cJbD>





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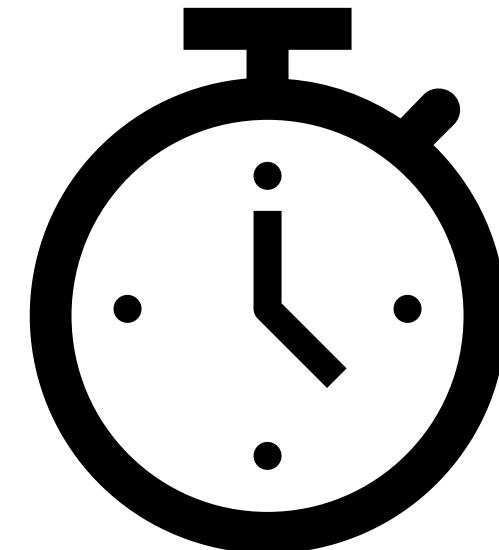
CODE for AMERICA

Supporting



# Úvodné informácie

- Časový rozvrh
- Prestávky
- Mobilné telefóny a zariadenia
- Otázky na úvod?



# Predstavenie

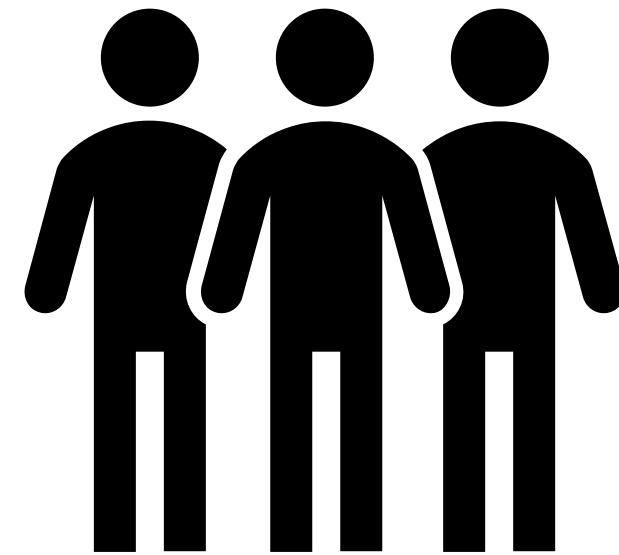
Vaše meno

Pracovná náplň/rola

Skúsenosti v IT

Skúsenosti s SQL a PL/SQL

Vaše hobby



# O lektorovi - Miroslav Reiter

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Google,  
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ISTQB tréner

115  
certifikácií

83 príručiek a  
publikácií

12 škôl

52 projektov

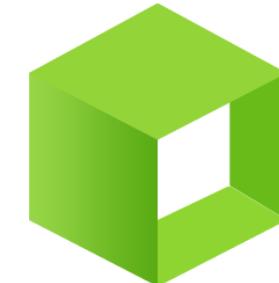


# Miroslav Reiter

1. PhDr. VŠM (Podnikovný manažment)
2. Ing. STU FEI (**Aplikovaná informatika**)
3. Mgr. UK FM (Strategický manažment a marketing)
4. Mgr. VŠM (**Manažérstvo kvality**)
5. Mgr. VŠEMVŠ (Verejná správa)
6. Mgr. DTI (Učiteľstvo ekonomických predmetov)
7. DiS. AMOS (Cestovný ruch)
8. MBA LIGS (Executive management)
9. DBA Humanum (**IT manažment**)
10. MPA IES (Verejná správa a samospráva krajov)
11. MSc. Humanum (**Bezpečnosť informačných systémov**)
12. Ing. Paed. IGIP



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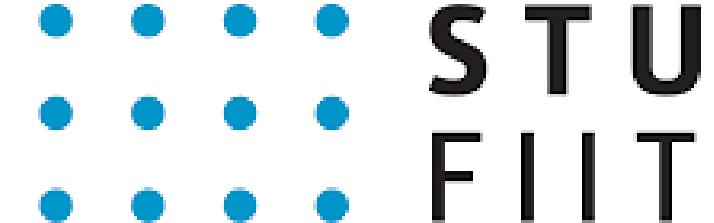


IT ACADEMY





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# Kde učím a vzdelávam?

# Vyber si online kurz

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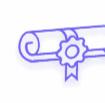
Zábavné online lekcie



Akreditované kurzy



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Online kurz Jazyk SQL I.  
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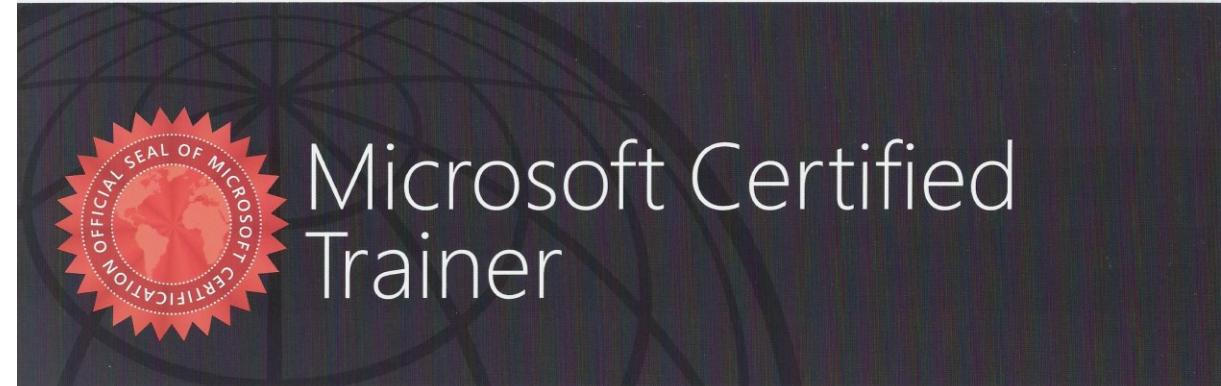
Online kurz JavaScript I.  
Začiatočník  
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# Miroslav Reiter

získava status  
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Automation

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MIROSLAV REITER

Has successfully completed the requirements to be recognized as a Microsoft Certified Trainer

N. S. Nadella  
Satya Nadella  
Chief Executive Officer

Microsoft  
CERTIFIED  
Trainer

# Vaše ciele a očakávania

Chcem sa certifikovať/získať certifikát

Chcem sa naučiť PL/SQL

Chcem sa naučiť konkrétny...

Chcem sa uliať/vypadnúť z práce

Chcem sa zabaviť

Chcem všetko...



# O firme - IT Academy

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kurzov

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príručiek,  
obsahu

Tvorba aplikácií  
a kampaní

Certifikácie a  
skúšky

Konzultácie

Automatizácia  
a vývoj aplikácií

# O nás

Naštartujte sa s nami v IT!



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# O nás



[digitalmarketinginstitute.com](http://digitalmarketinginstitute.com)



# Čo nás čaká a nemenie...

1. deň

Úvod do PL/SQL

Riadiace štruktúry

Spracovanie dát

Bloky

2. deň

Nástroje

Výnimky

Balíky

Kolekcie

Best practices | Faily | Fuckupy

# Ako efektívne písat' kód v jazyku PL/SQL?

---



# Volné miesta, platy, firmy

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- Ernst & Young
- T-Systems Slovakia
- BOGE
- ZSE
- CGI
- Henkel
- Swiss Re
- Accenture
- Profesia: **668 pozícii**
- Priemerný plat: **1 543/2 160 Eur**



Databázový analytik, konzultant, vývojár

**Čo je PL/SQL a na čo je dobrý?**



# Čo je PL/SQL?

Procedurálne rozšírenie SQL od Oracle

ORACLE



Procedúry, Funkcie, Cykly, Podmienky

# Čo je PL/SQL?

Procedurálne rozšírenie SQL od Oracle

**ORACLE**



Procedúry, Funkcie, Cykly, Podmienky

# SQL jazyk – Rozšírenie o procedúry

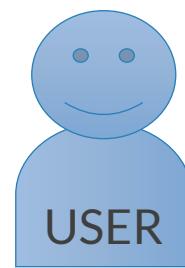
- Každý DB systém ma vlastný druh rozšírenia
- V relačných DB častokrát nájdeme aspoň tieto 2:
  - **PROCEDURE** – zoskupenie dopytov, výsledkom môže byť **tabuľka**
  - **FUNCTION** – zoskupenie dopytov, výsledkom je **skalárna hodnota**
- **Oracle – PL/SQL**
- Microsoft/Sybase – T-SQL
- MySQL – SQL/PSM (Persistent Stored Module)
- Sybase – Watcom-SQL
- PostgreSQL – PL/PSM

# Databázové Objekty

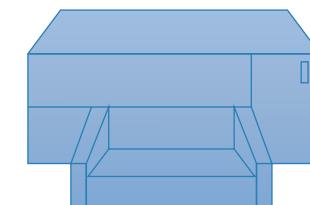
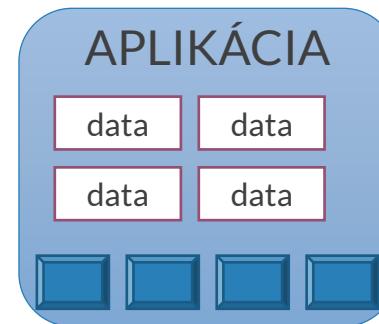
- **Databáza/Schéma** – zoskupenie objektov
- **Tabuľka** – štruktúrované zoskupenie dát
- **Index** – štruktúra dát zvyšujúca výkon a rýchlosť dopytov
  - Avšak na úkor diskových operácií a diskového priestoru
- **Procedúra, funkcia** – sekvencia dopytov
- **Pohľad** – predpripravený dopyt
- **Trigger** – špeciálna procedúra – vkladanie, aktualizácia a mazanie

# Databázové Objekty

ZDROJOVÝ KÓD  
MAKRÁ  
MODULY



FORMULÁRE  
FORMS



ZOSTAVY  
REPORTS

DOPYTY  
QUERIES

SQL, PL/SQL

TABUĽKY  
TABLES

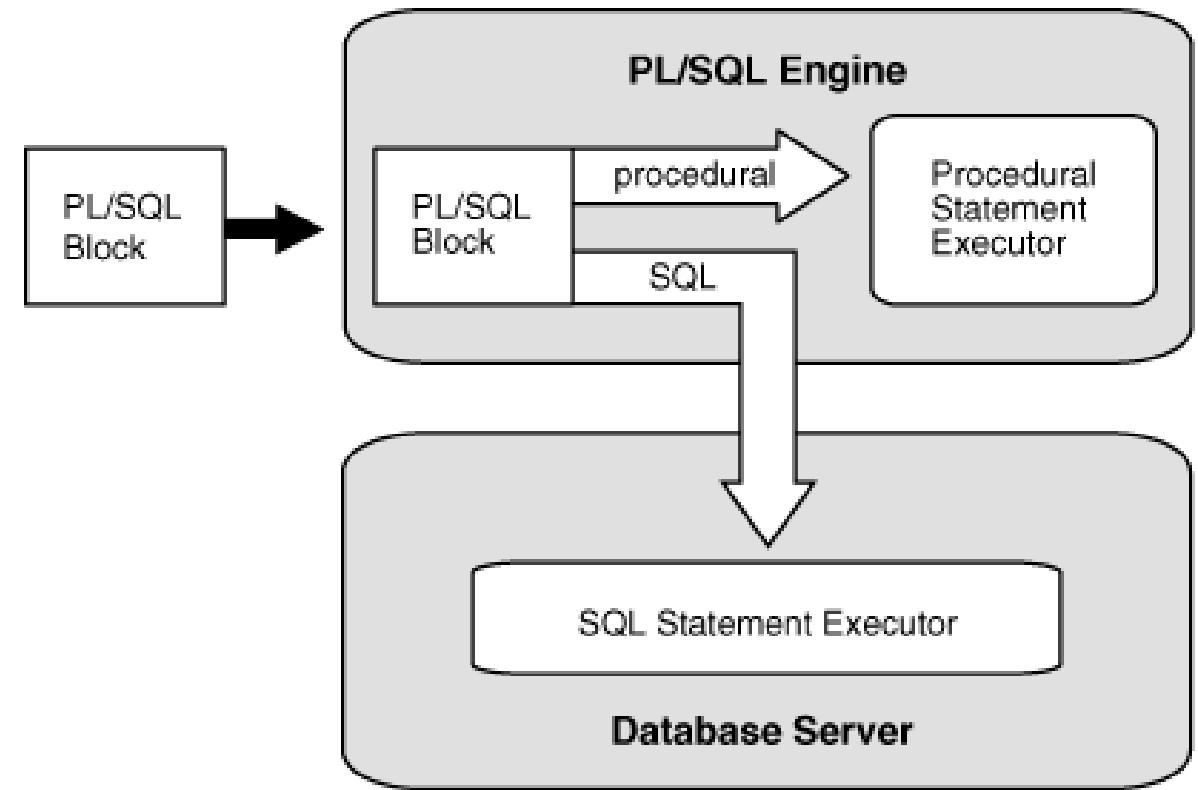
RDBMS

Databáza

SQL, PL/SQL

# PL/SQL Engine

- Kompilačný a runtime systém PL/SQL je engine, ktorý kompiluje a spúšťa jednotky PL/SQL
- Engine je možné nainštalovať do databázy alebo do nástroja na vývoj aplikácií, ako je napríklad Oracle Forms
- V oboch prostrediah engine PL/SQL akceptuje ako vstup akúkoľvek platnú jednotku PL/SQL.
- Engine spúšťa procedurálne príkazy, ale odosielá príkazy SQL do nástroja SQL v databáze



Oct 2022	Oct 2021	Change	Programming Language	Ratings	Change
1	1		 Python	17.08%	+5.81%
2	2		 C	15.21%	+4.05%
3	3		 Java	12.84%	+2.38%
4	4		 C++	9.92%	+2.42%
5	5		 C#	4.42%	-0.84%
6	6		 Visual Basic	3.95%	-1.29%
7	7		 JavaScript	2.74%	+0.55%
8	10		 Assembly language	2.39%	+0.33%
9	9		 PHP	2.04%	-0.06%
10	8		 SQL	1.78%	-0.39%
11	12		 Go	1.27%	-0.01%
12	14		 R	1.22%	+0.03%
13	29		 Objective-C	1.21%	+0.76%
14	13		 MATLAB	1.18%	-0.02%

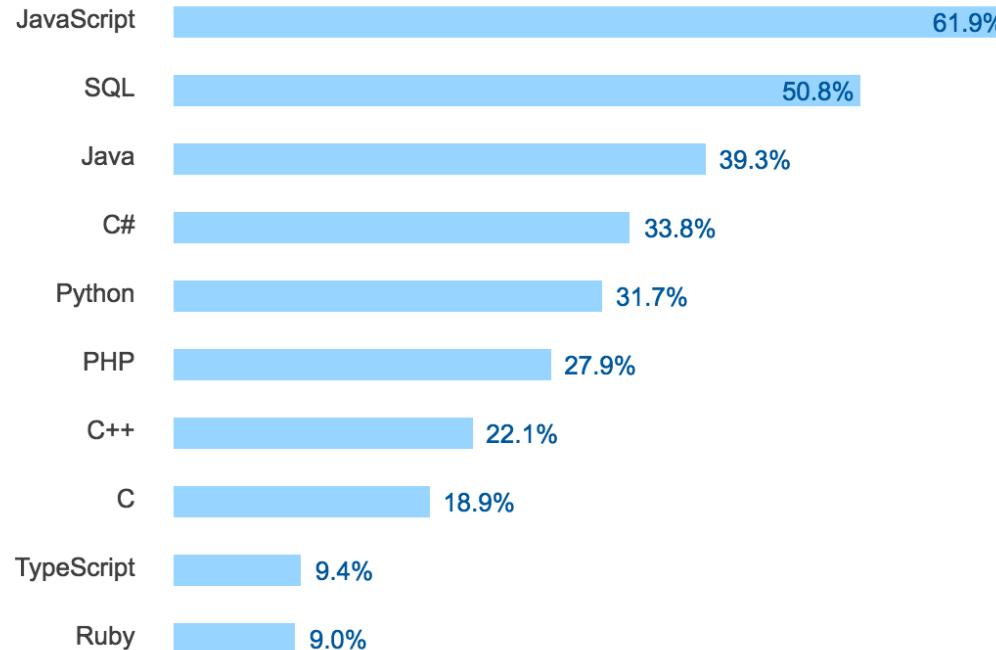
## Other programming languages

The complete top 50 of programming languages is listed below. This overview is published unofficially, because it could be the case that we missed a language. If you have the impression there is a programming language lacking, please notify us at [tpci@tiobe.com](mailto:tpci@tiobe.com). Please also check the [overview of all programming languages](#) that we monitor.

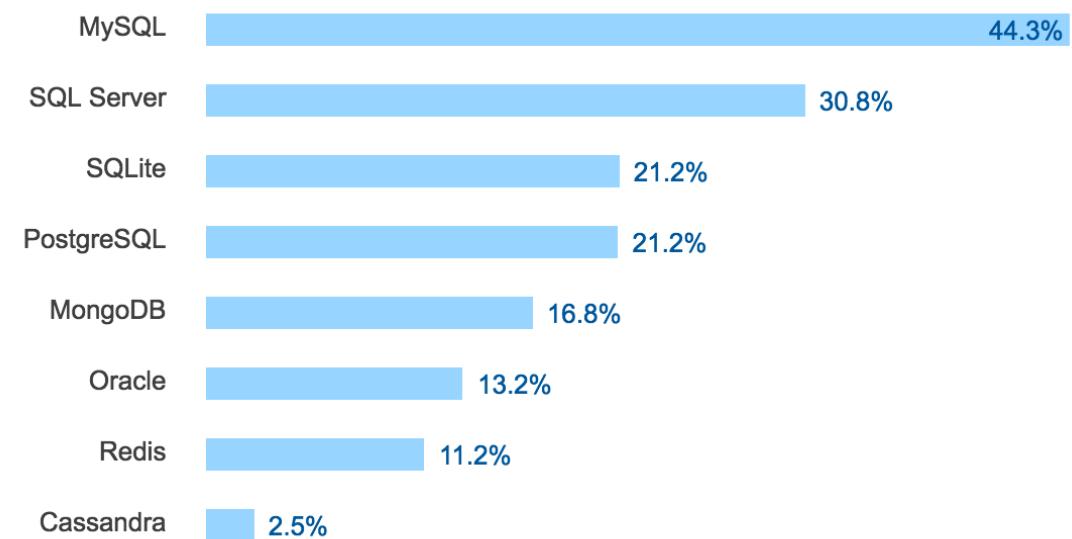
Position	Programming Language	Ratings
21	SAS	0.69%
22	Perl	0.69%
23	Scratch	0.67%
24	Lua	0.58%
25	PL/SQL	0.52%
26	Lisp	0.44%
27	Julia	0.43%
28	Kotlin	0.43%
29	Scala	0.42%
30	COBOL	0.39%
31	Ada	0.38%
32	(Visual) FoxPro	0.35%
33	Dart	0.35%
34	Prolog	0.30%
35	ABAP	0.28%
36	PowerShell	0.25%

# Štatistiky Stackoverflow

## Najpoužívanejšie jazyky



## Najpoužívanejšie DB



# Možnosti prístupu k databáze

Súbor na disku

Samostatný server

Distribuované  
databázové  
úložisko – Cloud,  
pole serverov, ...



## Oracle Database

Related Products

## Data Integration

## Other Databases

## Big Data

## Enterprise Manager

Home / Database / Oracle / Oracle Database

# Oracle Database Documentation

Oracle Database is the world's most popular database. Available on cloud and on-premises platforms, [Oracle Database 19c](#) is the most recent long term release, with an extended support window. [Oracle Database 21c](#) is the latest innovation release, initially available on Oracle cloud through Autonomous Database Free Tier and Database Cloud Service.

Oracle Database 21c



## Learn About Oracle Database

[Oracle Interactive Technical Architecture Diagrams](#)

[Get Started](#)

[What's New](#)

[Oracle Live SQL](#)

[Database Features and Licensing App](#)

## Topics

[Install and Upgrade](#)

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[Graph](#)

[Distributed Data](#)

[Machine Learning](#)

[JSON, XML, Full-Text](#)



# Základná štruktúra anonymných blokov

**DECLARE**

- Deklaračná sekcia
- v\_priezvisko **varchar2(10)** := 'Sangala'

**BEGIN**

- Výkonná/exekučná sekcia
- DBMS\_OUTPUT.PUT\_LINE(v\_priezvisko);

**EXCEPTION**

- Ošetrenie výnimiek/chýb
- **WHEN TOO\_MANY\_ROWS THEN**
- DBMS\_OUTPUT.PUT\_LINE('SELECT vrátil viacero riadkov');

**END;**

- Ukončenie bloku

# Výhody PL/SQL

Blokové štruktúry	Schopnosti procedurálneho jazyka	Lepší výkon	Spracovanie chýb
<ul style="list-style-type: none"><li>PL SQL pozostáva z blokov kódu, ktoré môžu byť vnorené do seba</li><li>Každý blok tvorí jednotku úlohy alebo logický modul</li><li>Bloky PL/SQL je možné uložiť do databázy a opäťovne použiť</li></ul>	<ul style="list-style-type: none"><li>PL SQL pozostáva z konštrukcií procedurálneho jazyka</li><li>Podmienené príkazy (if else príkazy) a slučky ako (cykly FOR)</li></ul>	<ul style="list-style-type: none"><li>PL SQL engine spracováva viacero SQL príkazov súčasne ako jeden blok, čím sa znižuje sieťová prevádzka</li></ul>	<ul style="list-style-type: none"><li>PL/SQL efektívne spracováva chyby alebo výnimky počas vykonávania programu PL/SQL</li><li>Akonáhle je výnimka zachytená, môžu sa vykonať špecifické akcie v závislosti od typu výnimky alebo sa môže zobraziť používateľovi so správou</li></ul>

# Prečo používať Balíčky (Packages)?

Logické  
Skupiny

Globálne  
Premenné

Session  
Data

Selektívna  
expozícia

Lepší dizajn  
aplikácie

Výkon



## SQL Worksheet

Clear

Find

Actions ▾

Save

Run

```
1 BEGIN
2     -- Najkratsi Ahoj Svet/Hello World skript
3     dbms_output.put_line('Ahoj Svet');
4 END;
5 /
```

Statement processed.

Ahoj Svet



Oracle SQL Developer

File Edit

Data Modeler

Analytic View

Bookmarks Ctrl+Shift+K

Breakpoints Ctrl+Shift+R

Cart

Change Management

Components Ctrl+Shift+P

Connections

DBA

Data Miner >

Show Only Editor Ctrl+Shift+Enter

**Dbms Output**

Debugger

Extension Diagnostics

Files

Find DB Object

Log Ctrl+Shift+L

Map View

Metrics Console

Migration Projects

OLAP

OWA Output

Processes

Properties Ctrl+Shift+I

REST Data Services

Recent Objects

Reports

SQL History F8

SSH

Snippets

Task Progress

Thumbnail Ctrl+Shift+T

TimesTen Scaleout

Editor

Show Toolbars

Show Status Bar

Refresh Ctrl+R

Full Screen

Window Help

Welcome Page X Kurz Oracle PL-SQL ~3 X

Kurz Oracle PL-SQL

Worksheet Query Builder

```
1 BEGIN
2     -- Najkratsi Ahoj Svet/Hello World skript
3     dbms_output.put_line('Ahoj Svet');
4 END;
```

Query Result X Script Output X

Task completed in 0,068 seconds

PL/SQL procedure successfully completed.

Dbms Output X

Buffer Size: 20000

Kurz Oracle PL-SQL x

Ahoj Svet

Line 2 Column 6 Insert Modified Windows: CR/LF

5°C Fog ENG US 18:35 13. 11. 2022

Aggregate Functions

COUNT(\*)

COUNT([ALL | DISTINCT] expr)

MAX(expr)

MEDIAN(expr)

MIN(expr)

STDDEV(expr)

SUM(expr)

VARIANCE(expr)

# PL/SQL Packages and Types Reference



▶ 119 DBMS\_OUTLN

▼ 120 DBMS\_OUTPUT

120.1 DBMS\_OUTPUT Overview

120.2 DBMS\_OUTPUT Security Model

120.3 DBMS\_OUTPUT Operational Notes

120.4 DBMS\_OUTPUT Exceptions

120.5 DBMS\_OUTPUT Rules and Limits

120.6 DBMS\_OUTPUT Examples

▶ 120.7 DBMS\_OUTPUT Data Structures

▶ 120.8 Summary of DBMS\_OUTPUT Subprograms

▶ 121 DBMS\_PARALLEL\_EXECUTE

▶ 122 DBMS\_PART

▶ 123 DBMS\_PCLXUTIL

▶ 124 DBMS\_PDB

▶ 125 DBMS\_PDB\_ALTER\_SHARING

▶ 126 DBMS\_PERF

▶ 127 DBMS\_PIPE

▶ 128 DBMS\_PLSQL\_CODE\_COVERAGE

▶ 129 DBMS\_PREDICTIVE\_ANALYTICS

## 120 DBMS\_OUTPUT

The `DBMS_OUTPUT` package enables you to send messages from stored procedures, packages, and triggers. The package is especially useful for displaying PL/SQL debugging information.

This chapter contains the following topics:

- [Overview](#)
- [Security Model](#)
- [Operational Notes](#)
- [Exceptions](#)
- [Rules and Limits](#)
- [Examples](#)
- [Data Structures](#)
- [Summary of DBMS\\_OUTPUT Subprograms](#)

### 120.1 DBMS\_OUTPUT Overview

The package is typically used for debugging, or for displaying messages and reports to SQL\*DBA or SQL\*Plus (such as are produced by applying the SQL command `DESCRIBE` to procedures).

The `PUT Procedure` and `PUT_LINE Procedure` in this package enable you to place information in a buffer that can be read by another trigger, procedure, or package. In a separate PL/SQL procedure or anonymous block, you can display the buffered information by calling the `GET_LINE Procedure` and `GET_LINES Procedure`.

If the package is disabled, all calls to subprograms are ignored. In this way, you can design your application so that subprograms are available only when a client is able to process the information.





## SQL Worksheet

[Clear](#)[Find](#)[Actions ▾](#)[Save](#)[Run ▶](#)

```
1 BEGIN
2   DBMS_OUTPUT.PUT('1. riadok (put)... ');
3   DBMS_OUTPUT.PUT('stale 1. riadok (put)... ');
4   DBMS_OUTPUT.NEW_LINE;
5   DBMS_OUTPUT.PUT_LINE('2. riadok (new_line + put_line)... ');
6   DBMS_OUTPUT.PUT('TEST');
7   DBMS_OUTPUT.NEW_LINE;
8   DBMS_OUTPUT.PUT_LINE('4. riadok' || CHR(10) || '5. riadok priklad LF (chr10)');
9   DBMS_OUTPUT.PUT_LINE(CHR(10));
10  DBMS_OUTPUT.PUT_LINE('9. riadok');
11 END;
12 /
```

Statement processed.

1. riadok (put)... stale 1. riadok (put)...

2. riadok (new\_line + put\_line)...

TEST

4. riadok

5. riadok priklad LF (chr10)

9. riadok





## SQL Worksheet

Clear

Find

Actions ▾

Save

Run

```
1 REM Kurz_PL_SQL_I-D1_01_Ahoj_Svet
2 DECLARE
3     -- Deklaracia premennych
4     sprava varchar(10):='Ahoj svet';
5 BEGIN
6     /*
7         PL/SQL spustitelne prikazy
8         put, put_line (odriadkuje)
9     */
10    dbms_output.put_line('Hello World');
11    dbms_output.put_line(sprava);
12    -- EXCEPTION
13    -- Spracovanie vynimiek/chyb
14 END;
15 /
```

Kurz\_PL\_SQL\_I-D1\_01\_Ahoj\_Svet

Statement processed.

Hello World

Ahoj svet





## SQL Worksheet

Clear

Find

Actions ▾

Save

Run

```
1 DECLARE
2     v_datum_aktualny TIMESTAMP;
3     v_datum_aktualny2 TIMESTAMP := CURRENT_TIMESTAMP;
4 BEGIN
5     SELECT systimestamp INTO v_datum_aktualny FROM dual;
6     -- Vypis aktualneho datumu a zretazenie
7     DBMS_OUTPUT.PUT_LINE('Aktualne je (TIMESTAMP, Datum + Cas): ' || v_datum_aktualny);
8     DBMS_OUTPUT.PUT_LINE('Aktualne je (TIMESTAMP2, Datum + Cas): ' || v_datum_aktualny2);
9     DBMS_OUTPUT.PUT_LINE('Aktualne je (Datum + Cas): ' || TO_CHAR(SYSDATE, 'DD-MON-YYYY HH24:MI:SS'));
10    DBMS_OUTPUT.PUT_LINE('Aktualne je (Datum SK/CZ): ' || TO_CHAR(SYSDATE, 'DD.MON.YYYY'));
11    DBMS_OUTPUT.PUT_LINE('Aktualne je (Cas SK/CZ, ine casove pasmo/pasmo servera): ' || TO_CHAR(SYSDATE, 'HH:MI:SS'));
12 END;
13 /
```

Statement processed.

Aktualne je (TIMESTAMP, Datum + Cas): 25-OCT-22 10.22.35.556609 AM  
Aktualne je (TIMESTAMP2, Datum + Cas): 25-OCT-22 03.22.35.556571 AM  
Aktualne je (Datum + Cas): 25-OCT-2022 10:22:35  
Aktualne je (Datum SK/CZ): 25.OCT.2022  
Aktualne je (Cas SK/CZ, ine casove pasmo/pasmo servera): 10:22:35





## SQL Worksheet

Clear

Find

Actions ▾

Save

Run

```
1 -- Upravit NLS_DATE_FORMAT na zobrazenie času
2 ALTER SESSION SET NLS_DATE_FORMAT='dd.mm.yyyy hh24:mi:ss';
3 BEGIN
4     -- yyyy-mm-dd hh24:mi:ss
5     dbms_output.put_line(SYSDATE);
6     -- Použitie SYSTIMESTAMP na zobrazenie vyššej presnosti času, napríklad milisekúnd
7     dbms_output.put_line(SYSTIMESTAMP);
8     dbms_output.put_line(TO_CHAR(SYSDATE,'dd.mm.yyyy hh24:mi:ss'));
9 END;
10 /
```

Statement processed.

Statement processed.

25.10.2022 13:05:19

25-OCT-22 01.05.19.432299000 PM +00:00

25.10.2022 13:05:19





## SQL Worksheet

Clear

Find

Actions ▾

Save

Run ▶

```
1 select * from scott.emp;
2
3 DECLARE
4 v_mzda_minimalna NUMBER;
5 v_priemerny_plat NUMBER;
6 v_pocet_zamestnancov NUMBER;
7 v_report_mzdy VARCHAR2(200);
8 BEGIN
9 SELECT COUNT(DISTINCT EMPNO), MIN(SAL), ROUND(AVG(SAL))
10 INTO v_pocet_zamestnancov, v_mzda_minimalna, v_priemerny_plat
11 FROM SCOTT."EMP";
12 v_report_mzdy:= 'V podniku je: ' || v_pocet_zamestnancov || ' zamestnancov, priemerna mzda je: ' ||
13 v_priemerny_plat || ' a najmensia mzda je: ' || v_mzda_minimalna;
14 DBMS_OUTPUT.PUT_LINE(v_report_mzdy);
15 END;
16 /
```

7654	MARTIN	SALESMAN	7698	28.09.1981 00:00:00	1250	1400	30
7844	TURNER	SALESMAN	7698	08.09.1981 00:00:00	1500	0	30
7876	ADAMS	CLERK	7788	23.05.1987 00:00:00	1100	-	20
7900	JAMES	CLERK	7698	03.12.1981 00:00:00	950	-	30
7934	MILLER	CLERK	7782	23.01.1982 00:00:00	1300	-	10

[Download CSV](#)

14 rows selected.

Statement processed.

V podniku je: 14 zamestnancov, priemerna mzda je: 2073 a najmensia mzda je: 800





## SQL Worksheet

[Clear](#)[Find](#)[Actions ▾](#)[Save](#)[Run ▶](#)

```
1 select * from scott.emp WHERE JOB = 'MANAGER';
2
3 DECLARE
4 v_mzda_minimalna NUMBER;
5 v_priemerny_plat NUMBER;
6 v_pocet_manazer NUMBER;
7 v_report_mzdy VARCHAR2(200);
8 BEGIN
9 SELECT COUNT(DISTINCT EMPNO), MIN(SAL), ROUND(AVG(SAL))
10 INTO v_pocet_manazer, v_mzda_minimalna, v_priemerny_plat
11 FROM SCOTT."EMP" WHERE JOB = 'MANAGER';
12 v_report_mzdy:= 'V podniku su: ' || v_pocet_manazer || ' manazeri, ich priemerna mzda je: ' ||
13 v_priemerny_plat || ' a najmensia mzda je: ' || v_mzda_minimalna;
14 DBMS_OUTPUT.PUT_LINE(v_report_mzdy);
15 END;
16 /
```

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7698	BLAKE	MANAGER	7839	01.05.1981 00:00:00	2850	-	30
7782	CLARK	MANAGER	7839	09.06.1981 00:00:00	2450	-	10
7566	JONES	MANAGER	7839	02.04.1981 00:00:00	2975	-	20

[Download CSV](#)

3 rows selected.

Statement processed.

V podniku su: 3 manazeri, ich priemerna mzda je: 2758 a najmensia mzda je: 2450





## SQL Worksheet

Clear

Find

Actions ▾

Save

Run ▶

```
1 SELECT * FROM scott.emp;
2 DECLARE
3     v_job_id scott.emp.EMPNO%TYPE;
4     v_job_pozicia scott.emp.JOB%TYPE;
5     v_max_mzda NUMBER;
6 BEGIN
7     v_job_id := '9999';
8     v_job_pozicia := 'DATABASE ANALYST/DEVELOPER';
9     v_max_mzda := 3000;
10    -- vkladanie udajov
11    INSERT INTO scott.emp VALUES (v_job_id, 'Sangala', v_job_pozicia, 7566, default, 10000, v_max_mzda, 20);
12    DBMS_OUTPUT.PUT_LINE('OK - Zaznam/riadok uspesne vlozeny');
13    -- uprava udajov
14    UPDATE scott.emp SET min_salary = ROUND(v_max_mzda/3) WHERE EMPNO = v_job_id;
15    DBMS_OUTPUT.PUT_LINE('OK - Udaj o mzde upraveny');
16    -- mazanie udajov
17    DELETE FROM scott.emp WHERE EMPNO = v_job_id;
18    DBMS_OUTPUT.PUT_LINE('OK - Udaje vymazane');
19    COMMIT;
20    -- ukončenie transakcie
21 END;
22 /
```

7900	JAMES	CLERK	7698	03.12.1981 00:00:00	950	-	30
7934	MILLER	CLERK	7782	23.01.1982 00:00:00	1300	-	10

Download CSV

14 rows selected.

ORA-06550: line 10, column 20:

PL/SQL: ORA-01031: insufficient privileges





## SQL Worksheet

[Clear](#)[Find](#)[Actions ▾](#)[Save](#)[Run ▶](#)

```
1 SELECT * FROM scott.emp;
2
3 DECLARE
4   v_pozicia VARCHAR2(15);
5   v_meno VARCHAR2(15);
6 BEGIN
7   SELECT ENAME, JOB INTO v_meno, v_pozicia
8   FROM scott.emp
9   WHERE ENAME = 'CLARK';
10  DBMS_OUTPUT.PUT_LINE(v_meno || ' ma poziciu: ' || v_pozicia);
11 EXCEPTION
12   WHEN TOO_MANY_ROWS THEN
13     DBMS_OUTPUT.PUT_LINE('Váš príkaz SELECT vrátil viacero riadkov. Zváž použitie kurzora... ');
14 END;
15 /
-- Procedúra PL/SQL bola úspešne dokončená.
```

7900	JAMES	CLERK	7698	03-DEC-81	950	-	30
7934	MILLER	CLERK	7782	23-JAN-82	1300	-	10

[Download CSV](#)

14 rows selected.

Statement processed.

CLARK ma poziciu: MANAGER



# Jazyk PL/SQL – Dátové Typy



# Znakové Dátové Typy

- **VARCHAR2** uchováva reťazce s premenlivou dĺžkou. Pri deklarácii premennej treba zadať jej maximálnu dĺžku (1 – 32 767 bytov). Dĺžku je možné zadať aj počtom znakov, vtedy sa potrebný počet bytov preráta podľa najväčej dĺžky ktorú znaková sada databázy využíva pre nejaký znak.  
nazov\_premennej **VARCHAR2(max\_dlzka [BYTE|CHAR])**
- **CHAR** pre reťazce pevnej dĺžky, táto sa zadáva pri deklarácii obdobne ako pri VARCHAR2 v rozmedzí 1-32 767 bytov alebo korešpondujúci počet znakov. Ak sa nezadá dĺžka, premenná bude dlhá 1 znak, ak sa nezadá CHAR alebo BYTE, určí sa to z hodnoty inicializačnej premennej NLS\_LENGTH\_SEMANTICS.
- **NVARCHAR2** unicode obdoba VARCHAR2, uchováva premenné v znakovnej sade definovanej parametrom NLS\_NCHAR\_CHARACTERSET t.j. UTF-8 alebo UTF-16
- **NCHAR** unicode obdoba CHAR

# Číselné Dátové Typy (Reálne)

- **NUMBER** je najpoužívanejší číselný dátový typ, ukladá decimálne hodnoty od  $10^{-130}$  do  $10^{126}-1$  nazov\_premennej **NUMBER** [(precision, scale)]
- Ak zadáme precision a scale, premenná bude číslo s pevnou desatinnou čiarkou. Precision je celkový počet signifikantných číslic v rozmedzí 1 až 38. Scale je počet číslic za desatinnou čiarkou (ak je kladné) alebo pred ňou (záporné scale).
- Rozmedzie scale je -84 až 127. Hodnoty, ktoré presnosťou presahujú scale premennej do ktorej majú byť vložené, budú implicitne zaokrúhlené. Ak nezadáme precision ani scale, premenná bude číslo s pohyblivou desatinnou čiarkou s dĺžkou maximálne 40 číslic.
- **BINARY\_FLOAT** a **BINARY\_DOUBLE** sa používajú pre čísla s pohyblivou desatinnou čiarkou a jednoduchou alebo dvojitou presnosťou podľa normy IEEE-754. **BINARY\_FLOAT** zaberá 4 byty a ukladá čísla od 1,17549435E-38F do 3,40282347E+38F. **BINARY\_DOUBLE** zaberie 8 bytov a spracuje čísla od 2,2250748585072014E-308 do 1,7976931348623157E+308.
- **SIMPLE\_FLOAT** a **SIMPLE\_DOUBLE** (od ver. 11g) je ich rýchlejšia alternatíva, ktorá ale nepodporuje NULL hodnoty, predikáty IS NAN a IS INFINITY a nekontroluje podmienky pretečenia

# Číselné Dátové Typy (Celé)

- **PLS\_INTEGER** ukladá celočíselné hodnoty (signed integer) od -2 147 483 648 do 2 147 483 647.
- Hodnoty sú reprezentované natívnym integer formátom príslušnej hardvérovej platformy, celočíselné výpočty sa tak vykonávajú rýchlejšie ako pri dátovom type NUMBER. PLS\_INTEGER je náhradou a ekvivalentom staršieho typu BINARY\_INTEGER.
- **SIMPLE\_INTEGER** (od ver. 11g) je rýchlejšia alternatíva PLS\_INTEGER, nepodporuje však NULL hodnoty a nekontroluje podmienky pretečenia.

# Dátumové Typy

- **DATE** ukladá datum a čas s presnosťou na sekundy.  
nazov\_premennej **DATE**
- **TIMESTAMP** ukladá datum a čas s presnosťou až na miliardtinu sekundy (9 miest, defaultne 6).  
nazov\_premennej **TIMESTAMP** [(precision)]
- **TIMESTAMP WITH TIMEZONE** ukladá datum a čas ako TIMESTAMP, navyše však ukladá informáciu o časovej zóne  
nazov\_premennej **TIMESTAMP** [(precision)]  
**WITH TIME ZONE**
- **TIMESTAMP WITH LOCAL TIMEZONE** ako TIMESTAMP, je však citlivý na rozdiely medzi SESSION\_TIMEZONE a DB\_TIMEZONE. Informácie sa pri ukládaní na server prepočítavajú a uložia v časovej zone databázy, naopak pri výbere sa prerátajú na časovú zónu session.  
nazov\_premennej **TIMESTAMP** [(precision)]  
**WITH LOCAL TIME ZONE**

# Intervalové Typy

- **INTERVAL YEAR TO MONTH** umožňuje ukladať časové úseky ako počet rokov a mesiacov
- **INTERVAL DAY TO SECOND** použijeme pre časové úseky zadané ako počet dní, hodín, minút a sekúnd (vrátane zlomkov sekúnd)

## Ďalšie Typy

- **BOOLEAN** môže nadobúdať 3 hodnoty – **TRUE**, **FALSE** a **NULL**
- **ROWID** slúži pre ukladanie fyzickej adresy riadka v tabuľke
- **UROWID** pre logickú adresu riadka v index organized tabuľke
- **REF CURSOR** a **SYS\_REF\_CURSOR** pre kurzorové premenné používané so statickým, alebo dynamickým SQL

# LOB Typy

- **CLOB** (Character Large Object) pre deklaráciu premennej, ktorá predstavuje LOB locator – odkaz na blok veľkého textu v databáze
- **NCLOB** odkaz na blok veľkého unicode textu v databáze
- **BLOB** odkaz na veľký binárny objekt uložený v databáze
- **BFILE** odkaz na veľký binárny objekt uložený mimo databázy

# SQL jazyk – dátové typy

- Syntax
  - Názov\_dátového\_typu(parametre)
- Textové reťazce
  - S pevnou dĺžkou
    - **CHAR** alebo CHARACTER
    - **NCHAR** alebo NATIONAL CHARACTER
  - S ohraňčenou variabilnou dĺžkou
    - **VARCHAR** alebo CHARACTER VARYING
    - **NVARCHAR** alebo NATIONAL CHARACTER VARYING



# SQL jazyk – dátové typy

- Bitové reťazce
  - S pevnou dĺžkou
    - **BIT**
  - S ohraničenou variabilnou dĺžkou
    - **BIT VARYING**



# SQL jazyk – dátové typy

- Čísla
  - Celé
    - **INTEGER** alebo **INT**, **SMALLINT**, **BIGINT**
  - S plávajúcou desatinnou čiarkou – Floating-point
    - **FLOAT** alebo **REAL**
    - **DOUBLE PRECISION**
  - S pevnou desatinnou čiarkou – Fixed-point
    - **NUMERIC**(celkový počet číslic, počet desatinných miest)
    - Alebo aj **DECIMAL**

# SQL jazyk – dátové typy

- Dátum
  - **DATE** (2014-09-22)
  - **TIME** (9:00:00)
  - **TIME WITH TIME ZONE** alebo **TIMEZ**
  - **TIMESTAMP** (2014-09-22 9:00:00)
  - **TIMESTAMP WITH TIME ZONE** alebo **TIMESTAMPZ**



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# Datasets Live SQL Editor

1. **Human Resources (HR)** - Oracle's HR sample schema.
2. Sales History (SH) - Oracle's SH sample schema (except SH.SALES\_TRANSACTIONS\_EXT).
3. **EMP and DEPT (SCOTT)** - Oracle's SCOTT schema (containing the commonly referenced EMP and DEPT tables).
4. **World Data (WORLD)** - Contains a WORLD\_POPULATION table populated with data from 1960-2012.
5. DinoDate Demo (DD) - The schema behind DinoDate: the Premier Dating Website for Dinosaurs, an open source demonstration application.
6. Analytic Views (AV) - Used by the Analytic Views Hands-On Introduction.
7. Olympic Data (OLYM) - Summer Olympic medal winners from 1896 - 2008. Curated by Simon Rogers (the Guardian) and released as open data;
8. Order Entry (OE) - Oracle's OE sample schema.
9. **Academic (AD)** - Contains course, department, faculty, etc. objects.



Code Library \

# Hello World

[Back](#)[Run Script](#)

Description

Simple example showing how to write text to the console.

Area

PL/SQL General

Contributor

Mike Hichwa (Oracle)

Share Link

[https://livesql.oracle.com/apex/livesql/file/content\\_O5AYPPUSM6T5230CRNHLODXT6.html](https://livesql.oracle.com/apex/livesql/file/content_O5AYPPUSM6T5230CRNHLODXT6.html)

Metrics

90 Likes, 6,765 Executions, Created 7 years ago, 1 Statements, 56 bytes

Statement 1

```
begin
    dbms_output.put_line('hello world');
end;
```

Illustrates DBMS\_OUTPUT package to print text to the console.

hello world





# My Session



Actions ▾

Reset Session

Save

Sort

most recent last ▾

View

Statements and Results ▾

Statement 1



```
begin
    dbms_output.put_line('hello world');
end;
```

Illustrates DBMS\_OUTPUT package to print text to the console.

Statement processed.  
hello world





Code Library \

# Hello World

Description	Simple Hello World
Area	PL/SQL
Contributor	Mik
Share Link	<a href="#">http://</a>
Metrics	
Statement 1	<pre>begin     dbms_output.put_line('hello world'); end;</pre> <p>hello world</p>

## Script Results

[Run Script](#)Script **Hello World**

### Success

1 statements ran successfully. 0 objects created.

Statement

1

```
begin
    dbms_output.put_line('hello world');
end;
```

Statement processed.  
hello world

Illustrates DBMS\_OUTPUT package to print text to the console.

[My Session](#)[SQL Worksheet](#)

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EMP and DEPT

Example EMP and DEPT tables. Classic Oracle tables with 4 departments and 14

Script 222 24502 2.5 ...

Hello World

Simple example showing how to write text to the console.

Script 44 3420 2.5 ye...

Baseball Teams and Players

Creates two tables: PLAYERS and TEAMS Teams are World Series teams from 2014: The

Script 29 2583 2.5 ye...

PL\_SQL\_TABLES

testing

Script 10 1287 1.7 ye...

SQL Joins

SQL Join query examples, used to select rows from multiple tables using a join key.

Script 45 1070 2.5 ye...

World Population Queries

Aggregation and various queries on shared world population schema data.

Script 34 1030 2.5 ye...

Other Scripts

Keywords Hi DBA

```
1 -- table for our logging
2 create table log_table
3 ( message varchar2(200)
4 )
5 //
6
7 -- create package spec
8 create or replace package pkg_test
9 is
10    -- define one public procedure
11    procedure do;
12 end;
13 //
14
15 -- create package body
16 create or replace package body pkg_test
17 is
```

[Build Schema !\[\]\(d1a88bef3b1503d05207105457efd072\_img.jpg\)](#)[Edit Fullscreen !\[\]\(bf85f374990a4b26da270bfd2e56be60\_img.jpg\)](#)[Browser !\[\]\(62812fd69e0a8c8b1f0a6ed8f6945ed9\_img.jpg\)](#)[\[//\] ▾](#)

```
1 -- execute the public procedure of the package
2 begin
3     pkg_test.do;
4 end;
5 //
6
7 -- dbms_output doesn't work, so we log into a table
8 -- (just like in real life) and select all records from it here
9 select *
10 from    log_table
11 //
```

[Run SQL !\[\]\(e5fdcd114e7b925931c79336e1b89396\_img.jpg\) ▾](#)[Edit Fullscreen !\[\]\(0f60349cfc83d6b1e1a7befda78499ae\_img.jpg\)](#)[\[//\] ▾](#)

✓ Record Count: 0; Execution Time: 3ms

[+ View Execution Plan](#)[link](#)

## MESSAGE

2 \* 12 = 24

✓ Record Count: 1; Execution Time: 1ms

[+ View Execution Plan](#)[link](#)

Did this query solve the problem? If so, consider donating \$5 to help make sure SQL Fiddle will be here next time you need help with a database problem. Thanks!

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ORACLE SQL Developer

Database Connection

Recent Databases Detected

Click to add the connection  
No TNS entries found in {USER Home dir=C:\Users\Administrator,  
ORACLE\_HOME=C:\app\Administrator\product\21c\dbhomeXE\network\admin}

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The screenshot shows the DBeaver application window. On the left, there's a tree view of database objects under 'Customer'. On the right, a results grid displays data from a 'Customer' table. The grid has columns for Address, City, State, Country, Name, Level, Type, and various IDs. A specific row for 'Boston' is highlighted. At the bottom, there are several small circular progress indicators.

Address	Type	City	Type	State	Type	Country	Type	Name	Level	Type	Table Name	Line
Qu 7 Block 5		Brisilia		SP		Brasil	75	Mr Cus...	4	INTGER	Customer	2,147,462
8210 111 87 NW		Edmonton		AB		Canada	76	Mr Fis...	1	VARCHAR	Customer	2,147,462
793 W Pender Street		Vancouver		BC		Canada	79	Mr Let...	2	VARCHAR	Customer	2,147,462
1800 Amphitheatre Parkway		Mountain View		CA		USA	94	Mr Co...	3	VARCHAR	Customer	2,147,462
1 Microsoft Way		Redmond		WA		USA	95	Mr Add...	4	VARCHAR	Customer	2,147,462
127 Broadway		New York		NY		USA	96	Mr City...	5	VARCHAR	Customer	2,147,462
1 Infinite Loop		Cupertino		CA		USA	95	Mr State...	6	VARCHAR	Customer	2,147,462
541 Del Monte Avenue		Mountain View		CA		USA	94	Mr Cou...	7	VARCHAR	Customer	2,147,462
801 W 4th Street		Reno		NV		USA	89	Mr Post...	8	VARCHAR	Customer	2,147,462
120 S Orange Ave		Orlando		FL		USA	32	Mr Phone...	9	VARCHAR	Customer	2,147,462
Teufelsdröckhstraße 8		Berlin				Germany	10	Mr Fax...	10	VARCHAR	Customer	2,147,462
69 Salem Street		Boston		MA		USA	21	Mr Email...	11	VARCHAR	Customer	2,147,462
162 E Superior Street		Chicago		IL		USA	60	Mr Sup...	12	INTGER	Customer	2,147,462
319 M. Frances Street		Madison		WI		USA	53					
2211 N Berry Street		Fort Worth		TX		USA	79					
1033 N Park Ave		Tucson		AZ		USA	85					
302 S 700 E		Salt Lake City		UT		USA	84					
798 Dundas Street West		Toronto		ON		Canada	M1					
230 Elgin Street		Ottawa		ON		Canada	K2					
194A Chain Lake Drive		Halifax		NS		Canada	B3					
889 Osborne Street		Winnipeg		MB		Canada	R3					
5112 44 Street		Vancouver		NT		Canada	A1					



# SQL Tutorial

Learn SQL using: SQL Server, Oracle, MySQL, DB2, and PostgreSQL.

Language: English • 中文

## Tutorials: Learn SQL in stages

### 0 SELECT basics

Some simple queries to get you started

### 1 SELECT name

Some pattern matching queries

### 2 SELECT from World

In which we query the World country profile table.

### 3 SELECT from Nobel

Additional practice of the basic features using a table of Nobel Prize winners.

### 4 SELECT within SELECT

In which we form queries using other queries.

### 5 SUM and COUNT

In which we apply aggregate functions. [more the same](#)

### 6 JOIN

In which we join two tables; game and goals. [previously music tutorial](#)

### 7 More JOIN operations

In which we join actors to movies in the Movie Database.

### 8 Using Null

In which we look at teachers in departments. [previously Scottish Parliament](#)

### 8+ Numeric Examples

In which we look at a survey and deal with some more complex calculations.

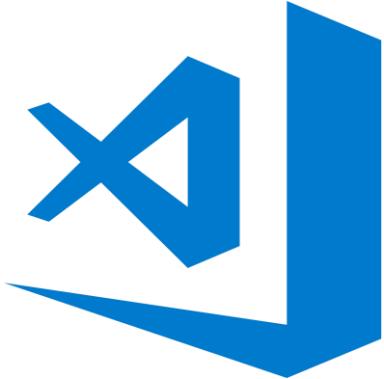
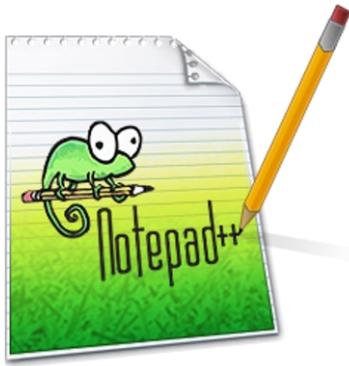
### 9 Self join

SELECT basics	
quiz	
SELECT from world	
quiz	
SELECT from nobel	
quiz	
SELECT in SELECT	
quiz	
SUM and COUNT	
quiz	
JOIN	
quiz	
More JOIN	
quiz	
Using NULL	
quiz	
Self JOIN	
quiz	

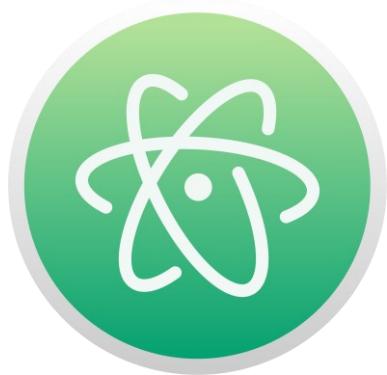
Reference

Tools

# Aký editor mám použiť?



```
:::  
iLE88Dj. :jD88888Dj:  
.LGitE888D.f8GjjjL8888E;  
iE :8888Et. .G888.  
;i E888, ,8888,  
D888, :8888:  
D888, :8888:  
D888, :8888:  
D888, :8888:  
888W, :8888:  
W88W, :8888:  
W88W: :8888:  
DGGD: :8888:  
:8888:  
:W888:  
:8888:  
E888i  
tW88D
```



# Generate test data for your database

## Quick recipes to test real applications with random data

Table Structure:  Export Format:  Generated rows:

Use an existing data model and customize it to mimick your table structure or create one from scratch.

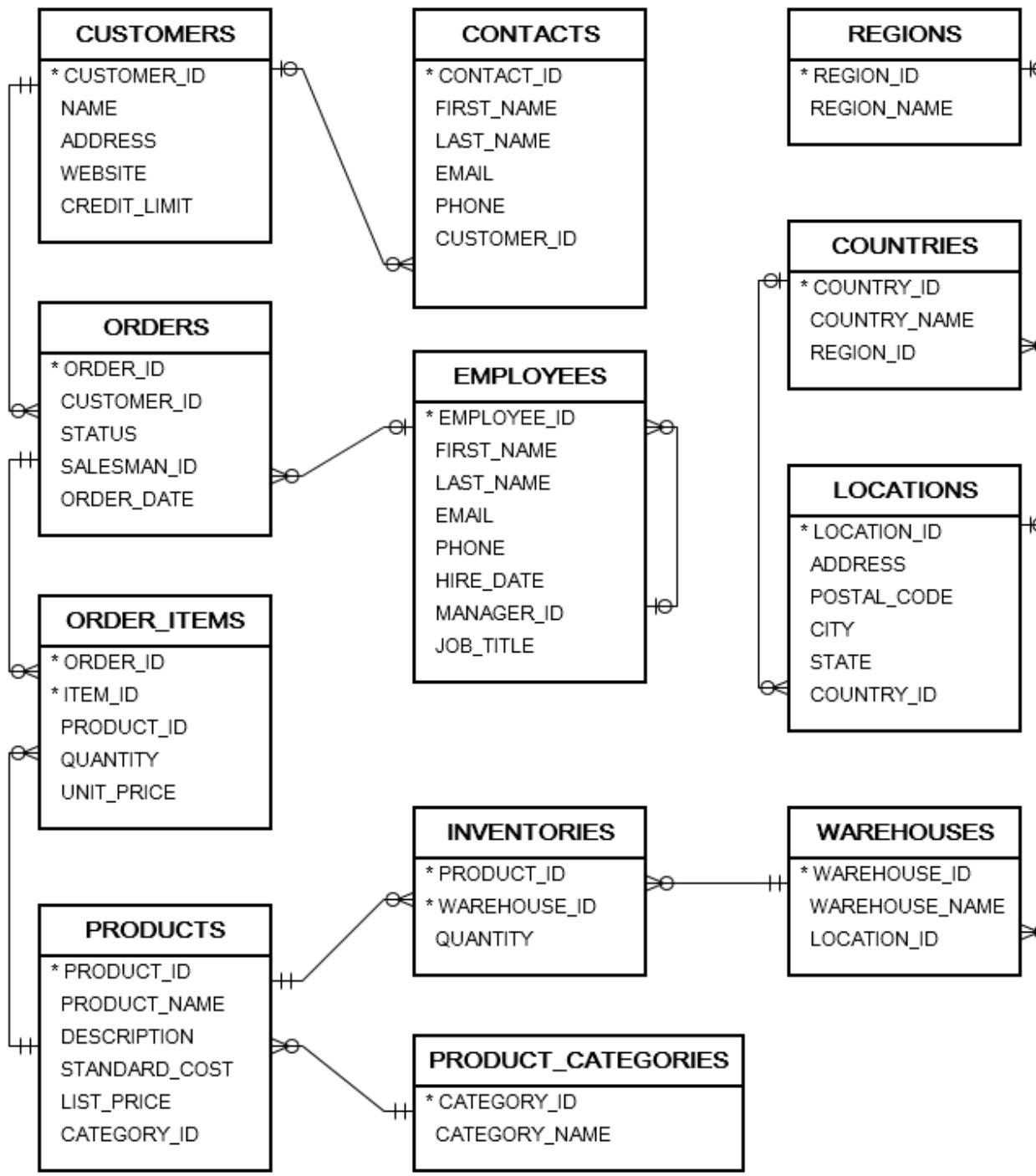
#	Column title	Data type	Delete
1	<input type="text" value="Id"/> 	<input type="button" value="Auto-increment"/>	
2	<input type="text" value="Full Name"/>	<input type="button" value="Full Name"/>	
3	<input type="text" value="Country"/>	<input type="button" value="Country"/>	
4	<input type="text" value="Email"/>	<input type="button" value="Email"/>	
5	<input type="text" value="Created At"/>	<input type="button" value="DateTime"/>	

### Why do I need to fill a database with random data?

When developing an application, you would be wise to test it. You might test it for correctness and you might test it for load. Both of these situations benefit from having a large body of data that is semi-coherent (so you can kind of inspect it) but that is automatically generated. Manually inserting 3 or 4 rows in each table just isn't good enough. This is an attempt at making the problem smaller. Generating fixtures has never been easier.





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## Databáza zamestnancov + klientov

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Your data set name here...

SAVE



## COUNTRY-SPECIFIC DATA

All countries

## DATA SET

Order	Table Column	Data Type	Examples	Options	Help	Del
1		Select Data Type				<input type="checkbox"/>
2		Select Data Type				<input type="checkbox"/>
3		Select Data Type				<input type="checkbox"/>
4		Select Data Type				<input type="checkbox"/>

Add  Row(s)

## EXPORT TYPES

[CSV](#) [Excel](#) [HTML](#) [JSON](#) [LDIF](#) [Programming Language](#) [SQL](#) [XML](#) [- hide data format options](#)

Database table name

Statement Type

 INSERT INSERT IGNORE UPDATE

Database Type

INSERT batch size

Misc Options

 Include CREATE TABLE query

Primary Key

 None Include DROP TABLE query Add default auto-increment column Enclose table and field names with backquotesGenerate  rows Generate in-page  New window/tab  Prompt to download  Zip?**Generate**

 Dashboard Pricing My Account Sensors FAQ Cost optimization Support

Hi, please tell us which database you're using:



Other  
databases



[Project](#)

## plsql-utils

[Source](#)[Issues](#)

Oracle PL/SQL Utility Library, codename "Alexandria"

[Wikis](#)

### IMPORTANT NOTE

[Downloads](#)

**THIS PROJECT HAS NOW MOVED TO  
GITHUB**

<https://github.com/mortenbra/alexandria-plsql-utils>

**PLEASE GO TO THE GITHUB LINK  
ABOVE FOR LATEST UPDATES**



This library is a collection of various utility packages for PL/SQL, as well as links to useful libraries hosted and maintained elsewhere.

### Generate PDF files using PL/SQL

- [http://technology.amis.nl/2012/04/11/generating-a-pdf-document-with-some-plsql-as\\_pdf\\_mini-as\\_pdf3/](http://technology.amis.nl/2012/04/11/generating-a-pdf-document-with-some-plsql-as_pdf_mini-as_pdf3/)
- [http://technology.amis.nl/blog/8650/as\\_pdf-generating-a-pdf-document-with-some-plsql](http://technology.amis.nl/blog/8650/as_pdf-generating-a-pdf-document-with-some-plsql)
- <http://www.erasme.org/PI-EPDFE1337?lang=en>

### Project Information

- License: [New BSD License](#)
- 116 stars
- svn-based source control

Labels:

[plsql](#) [ntlm](#) [Database](#) [oracle](#) [json](#)  
[pdf](#) [excel](#) [zip](#) [xml](#) [soap](#) [rss](#)  
[amazon](#) [ftp](#) [smtp](#) [ooxml](#)

# Style Guide

Before we talk about the optimization of actual SQL queries in Oracle, we want to take a moment and discuss a few best practices regarding style. These recommendations do not improve the performance of your queries in any way, but they may well increase your productivity, especially when it comes to debugging your code. Other than that, your credibility as a developer might get a slight bump.

## Conventions

Stick to existing rules regarding style, object nomenclature, comments, and documentation as much as possible. When it comes to object naming, be sure to follow whatever is generally accepted at your organization. For example, are underscores used (`FIRST_NAME`) instead of spaces or is it common to simply concatenate words (`FIRSTNAME`)? If there are no rules or guidelines yet, establish them with your team, write them down with plenty of examples so that they are clear to all, publish them where everyone can see them, and stick to your guns. Although it should be clear, we'll say it anyway: be consistent.

Use the ANSI-standard `JOIN` in `FROM` clauses rather than the deprecated versions with commas and the `(+)` operator for outer joins. It's deprecated, so leave it be.

## Capitalization

Keywords, reserved words, reserved namespaces and objects (i.e. tables, columns, indexes, ...) are by default case-insensitive in Oracle, unless you have surrounded them by double quotes, like so:

`SELECT 42 AS "THE Answer" FROM DUAL`. It is generally not recommended that you use case-sensitive object names or names with spaces. Translation of object names into more human-readable formats is something that should ultimately be handled by an application and not the database. Note, however, that strings can be case-sensitive: `SELECT last_name FROM people WHERE last_name = 'Jones'` is different from `SELECT last_name FROM people WHERE last_name = 'jones'`.

## Semicolons

Sentences end with full stops, SQL statements with semicolons. Not all RDBMS clients require a semicolon to execute a single SQL statement, but you save yourself a lot of trouble if you just learn

# Oracle SQL and PL/SQL Coding Guidelines

Ian Hellström

Introduction Source Control Plural vs Singular Style and Formatting Rules Naming Conventions PL/SQL Modules Exceptions

## Introduction

To enable database developers on the same team to read one another's code more easily, and to have consistency in the code produced and to be maintained, a set of coding guidelines and standards is provided. The guidelines described in this document have been borrowed heavily from Steven Feuerstein's [Ideas for Oracle PL/SQL Naming Conventions and Coding Standards](#), TopCoder's [Oracle PL/SQL Coding Guidelines](#), Jonathan Ingram's [SQL and PL/SQL Coding Standards](#), and a 2008 white paper by Bryn Llewellyn entitled [Doing SQL from PL/SQL: Best and Worst Practices](#).

## Source Control

All database objects have to be placed in a repository with revision control. Each entity has its own file.

By entity we mean a unit of code that belongs together. For instance, a package or object body and all its members form one entity. The package specification or object definition is another entity. A table, constraints on its columns, and related indexes are a single entity. Comments on the table and its columns are a separate entity though.

By grouping entities in separate files it is easy to navigate through the folder structure of the repository, run scripts against individual entities and objects, and create, compile, or alter individual components.

Each file name is derived from a file prefix that based on the entity *type* it defines, the *name* of the entity itself, and a corresponding *file extension*:

PREFIX [WRAP] - entity\_name.EXTENSION

Wrapped entities are indicated by WRAP appended to the file prefix. The prefix appendage WRAP is thus optional. For example, `PACKAGE WRAP - utilities.pkb` is the wrapped package body of the `utilities` package. The (unwrapped) source of that particular package body is of course also available in the repository and called `PACKAGE - utilities.pkb`.

Oracle SQL Developer

File Edit View Navigate Run Team Tools Window Help

Connections X

- + Oracle Connections
- Kurz Oracle PL-SQL
- + Oracle Free Cloud Database
- + Skolenie Oracle PL-SQL
- Database Schema Service Connections

Welcome Page X Kurz Oracle PL-SQL X Unit Line Counts X

Owner	Object Type	PL/SQL Object Name	Lines
1 ADMIN	TRIGGER	EMPLOYEES BIU	9
2 ADMIN	TRIGGER	DEPARTMENTS BIU	9
3 ADMIN	FUNCTION	DEPT SALARY	25

Snippets X

Aggregate Functions

- COUNT(\*)
- COUNT([ALL | DISTINCT])
- MAX(expr)
- MEDIAN(expr)
- MIN(expr)
- STDDEV(expr)
- SUM(expr)
- VARIANCE(expr)

Reports X

All Reports

- Analytic View Reports
  - Analytic View Dictionary Reports
    - Analytic Views
    - Attribute Dimensions
    - Hierarchies
  - Data Dictionary Reports
  - Data Modeler Reports
  - OLAP Reports
- TimesTen Reports
  - About Your Database
  - All Objects
  - Cache Groups
  - Database Administration
  - Performance
- PLSQL
  - Program Unit Arguments
  - Search Source Code
  - Unit Line Counts
- Security
- Table
- User Defined Reports

Dbms Output X Buffer Size: 20000

Statements - Log X

Sequence	Connection Name	Elapsed	SQL
10699		22	declare l_theCursor integer default dbms_sql.open_cursor; l_status integer default -1; insql...
10698		36	INSERT INTO `countrylanguage` VALUES ('VCT','English',T,0.0)
10697		18	declare l_theCursor integer default dbms_sql.open_cursor; l_status integer default -1; insql...
10696		40	INSERT INTO `countrylanguage` VALUES ('VCT','Creole English',F,99.1)
10695		19	declare l_theCursor integer default dbms_sql.open_cursor; l_status integer default -1; insql...
10694		36	INSERT INTO `countrylanguage` VALUES ('VAT','Italian',T,0.0)
10693		39	declare l_theCursor integer default dbms_sql.open_cursor; l_status integer default -1; insql...
10692		34	INSERT INTO `countrylanguage` VALUES ('UZB','Uzbek',T,72.6)
10691		18	declare l_theCursor integer default dbms_sql.open_cursor; l_status integer default -1; insql...
10690		36	INSERT INTO `countrylanguage` VALUES ('UZB','Tatar',F,1.8)

Messages Statements X Logging Page X

7 5

# Report a Unit Testy



# Free Oracle Database for Everyone

Whether you are a developer, a DBA, a data scientist, an educator, or just curious about databases, Oracle Database Express Edition (XE) is the ideal way to get started. It is the same powerful Oracle Database that enterprises rely on worldwide, packaged for simple download, ease-of-use, and a full-featured experience. You get an Oracle Database to use in any environment, plus the ability to embed and redistribute – all completely free!

[Quick Start](#)[Download Oracle Database XE](#)[FAQ](#)

## Videos



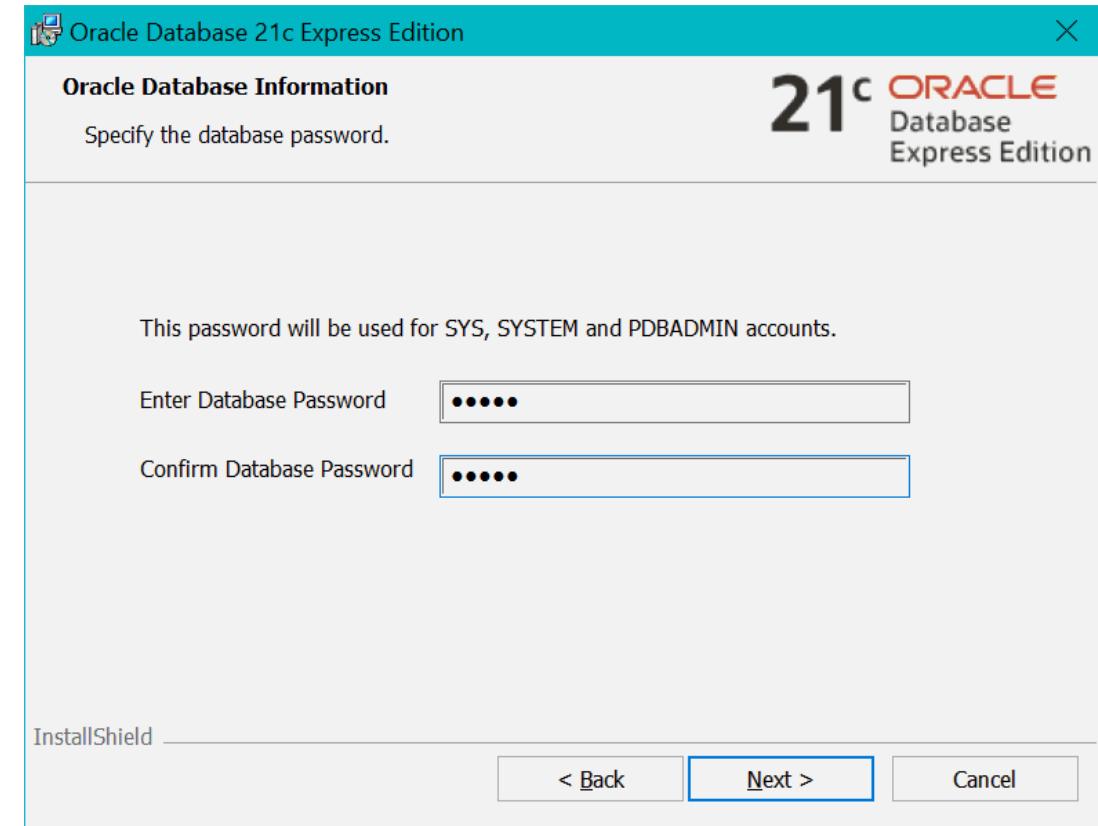
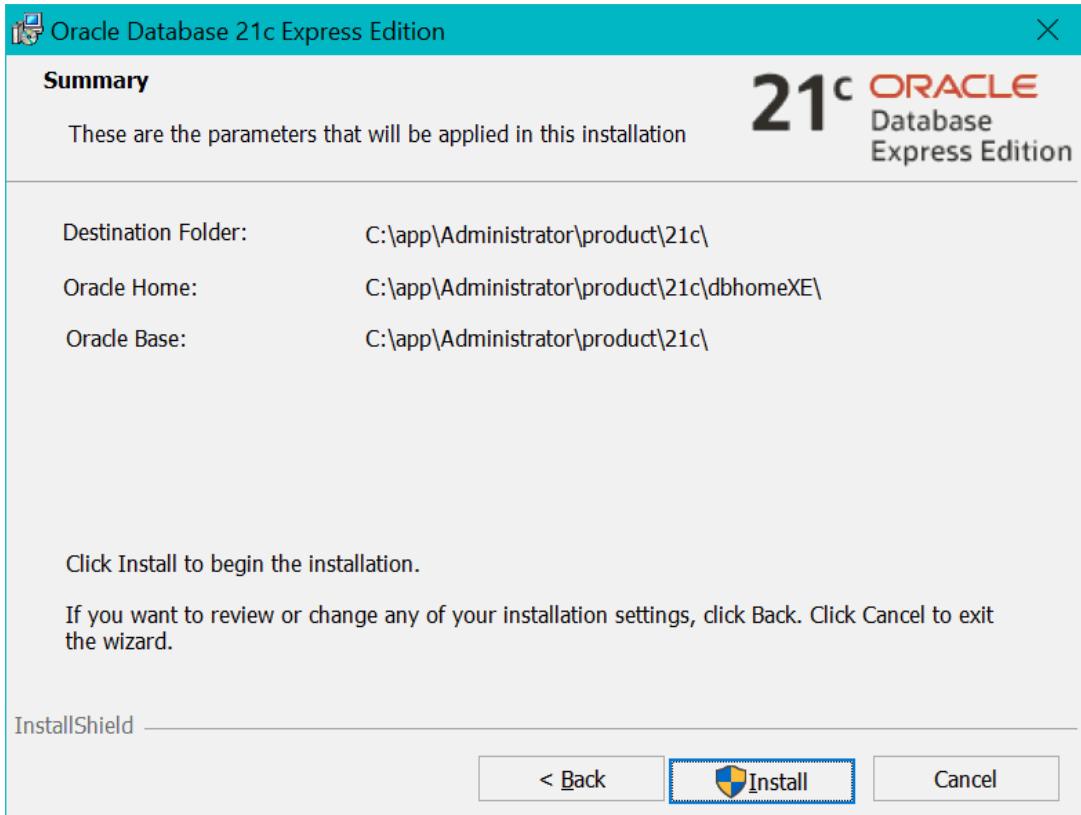
## Oracle Database XE Downloads

### Oracle Database 21c Express Edition

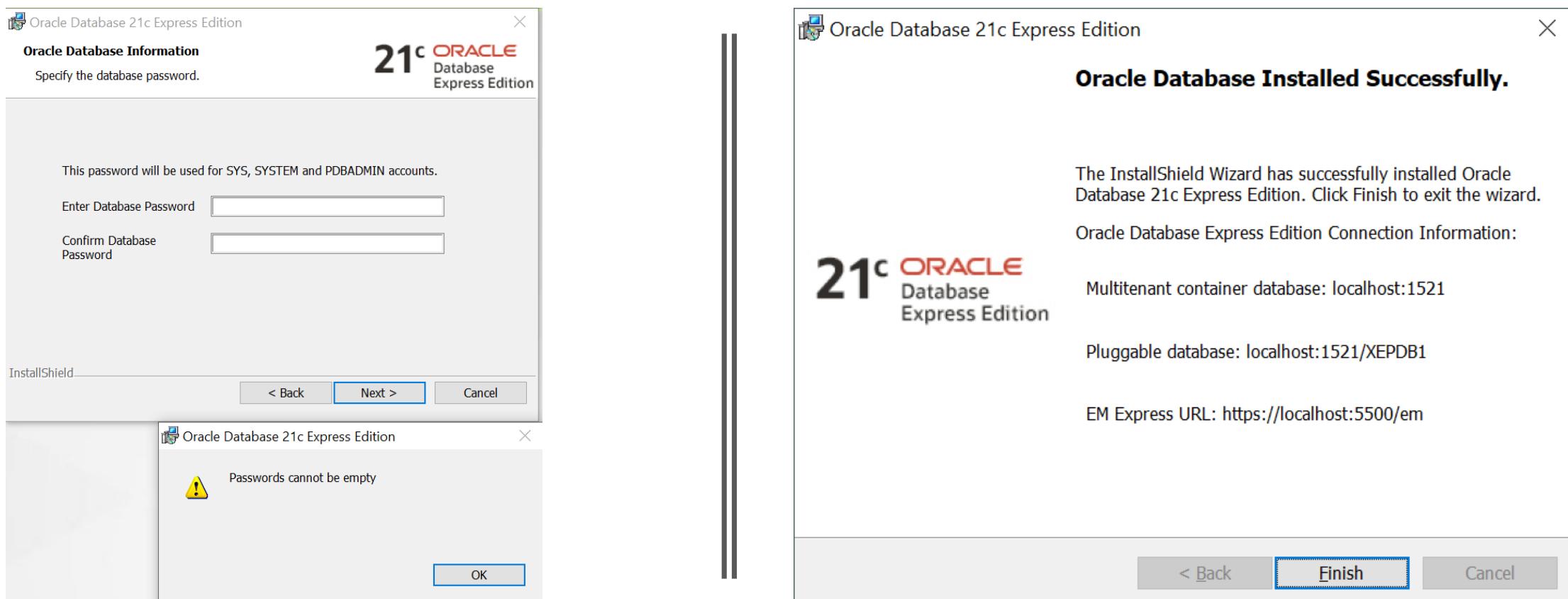
Download	Description
<a href="#"> Oracle Database 21c Express Edition for Windows x64</a>	(1,967,615,483 bytes - October 08, 2021) [Sha256sum: 939742c3305c466566a55f607638621b6aa7033a183175f6bcd6cffb48e6bc3f]
<a href="#"> Oracle Database 21c Express Edition for Linux x64 ( OL8 )</a>	(2,339,651,768 bytes - September 08, 2021) [Sha256sum: f8357b432de33478549a76557e8c5220ec243710ed86115c65b0c2bc00a848db]
<a href="#"> Oracle Database 21c Express Edition for Linux x64 ( OL7 )</a>	(2,339,017,432 bytes - September 08, 2021) [Sha256sum: 4c8f40a19d4d1a2f00e46df022943a04cc13fe62aed27c4c66a137e72f513c36]



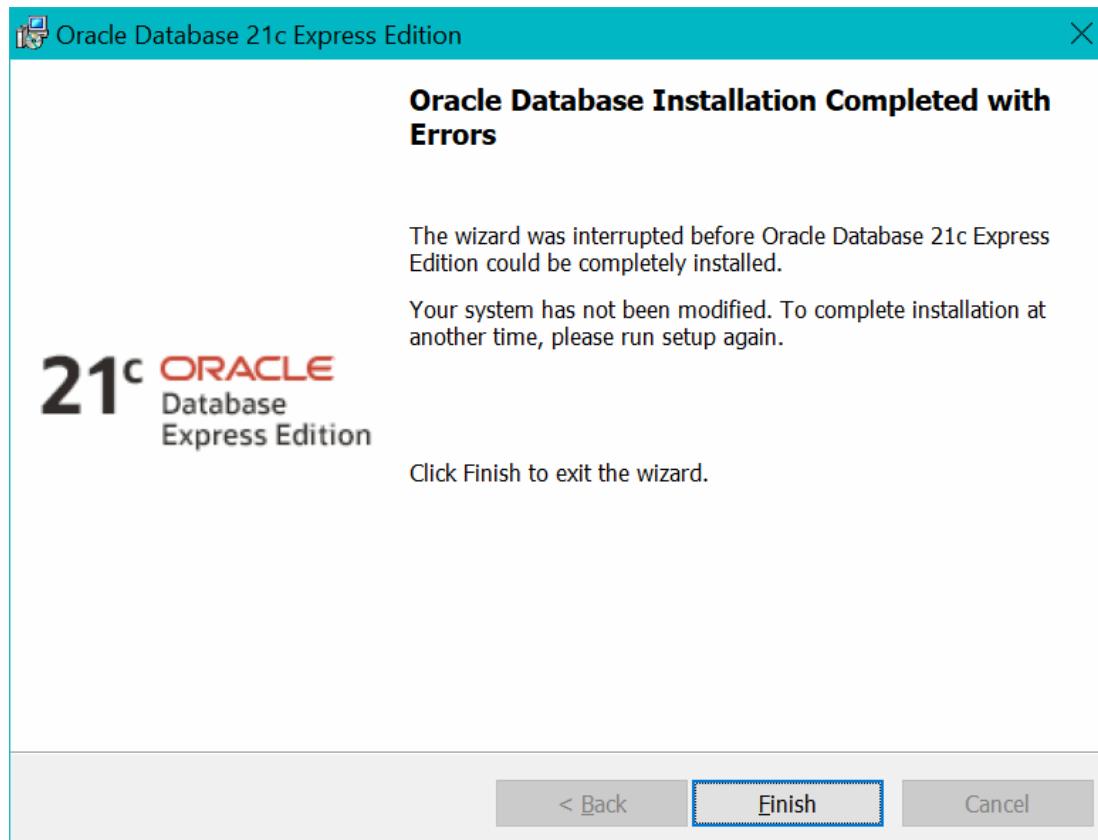
# Inštalácia Oracle Database 21c Express Edition



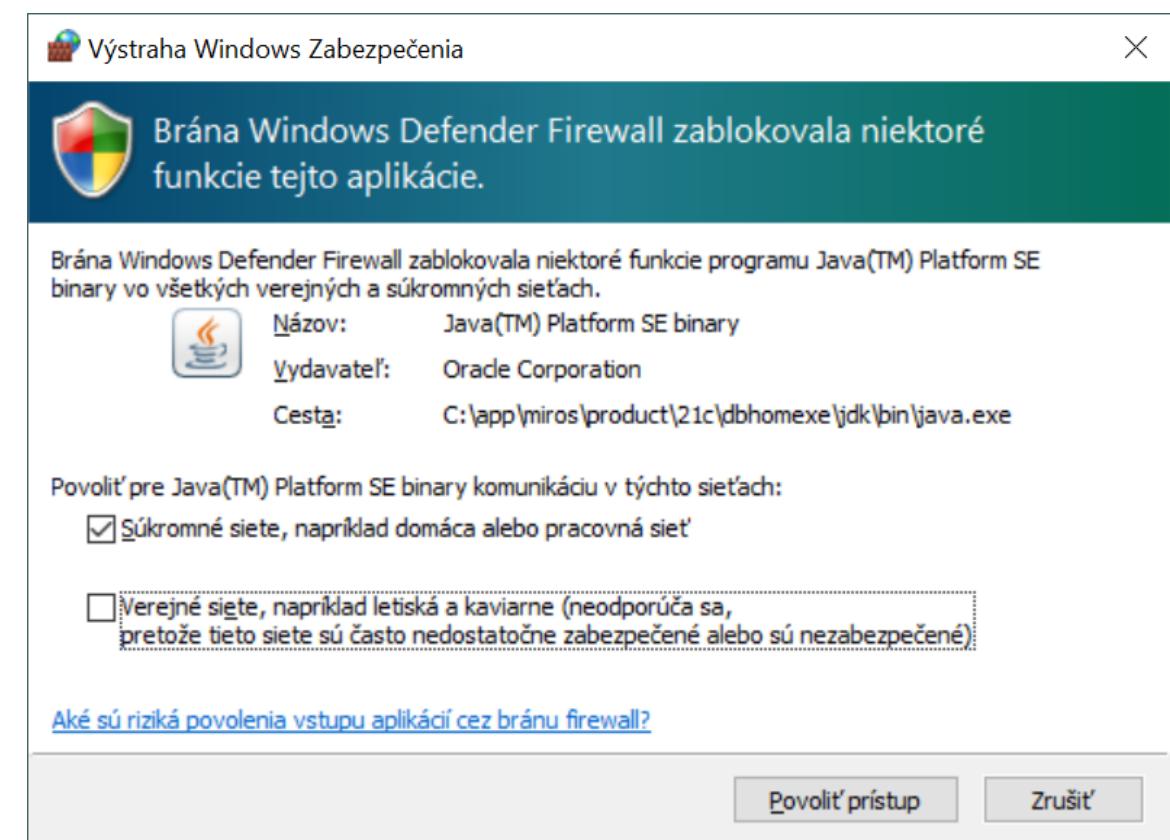
# Inštalácia Oracle Database 21c Express Edition



# Inštalácia Oracle Database 21c Express Edition

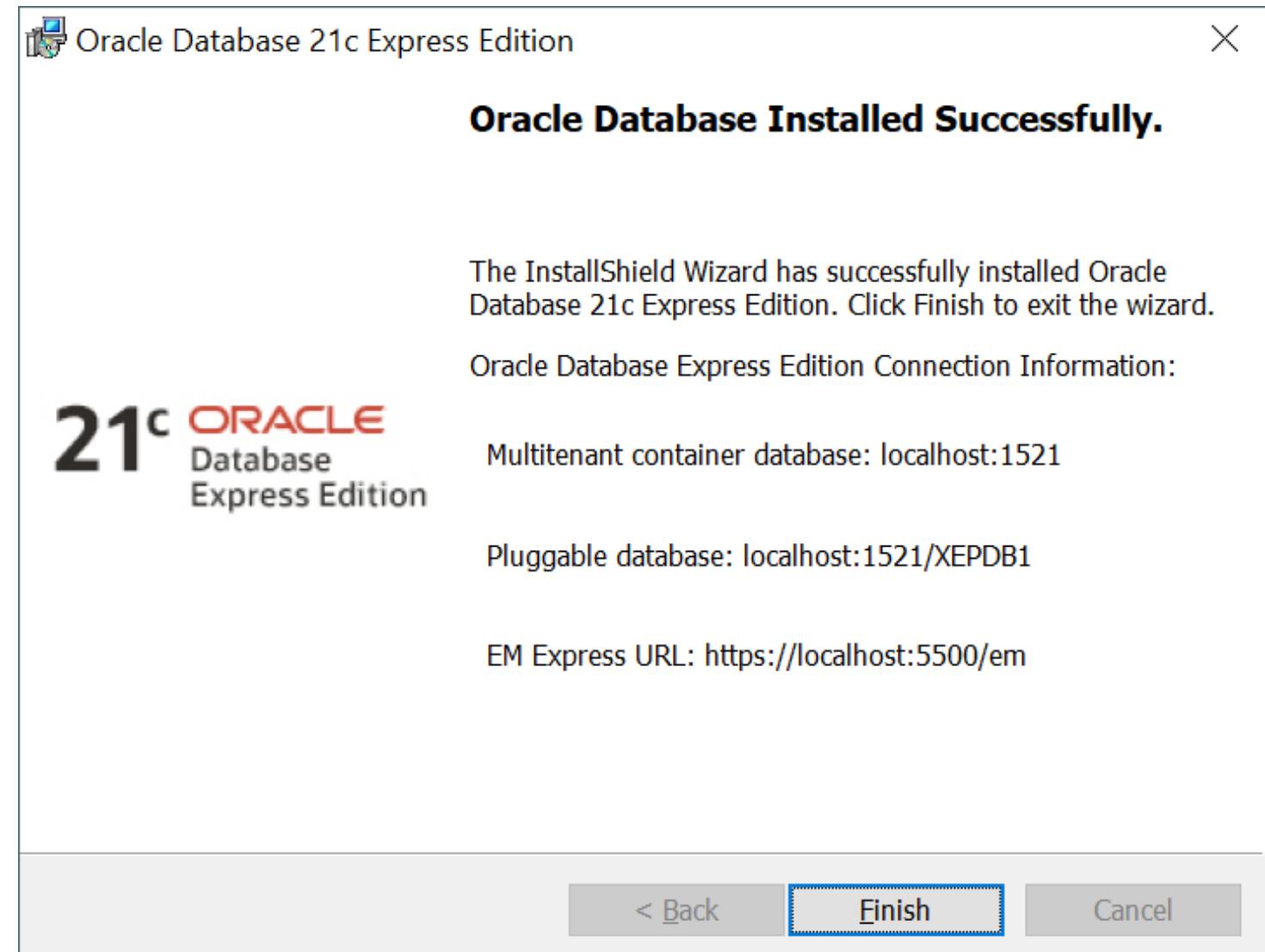


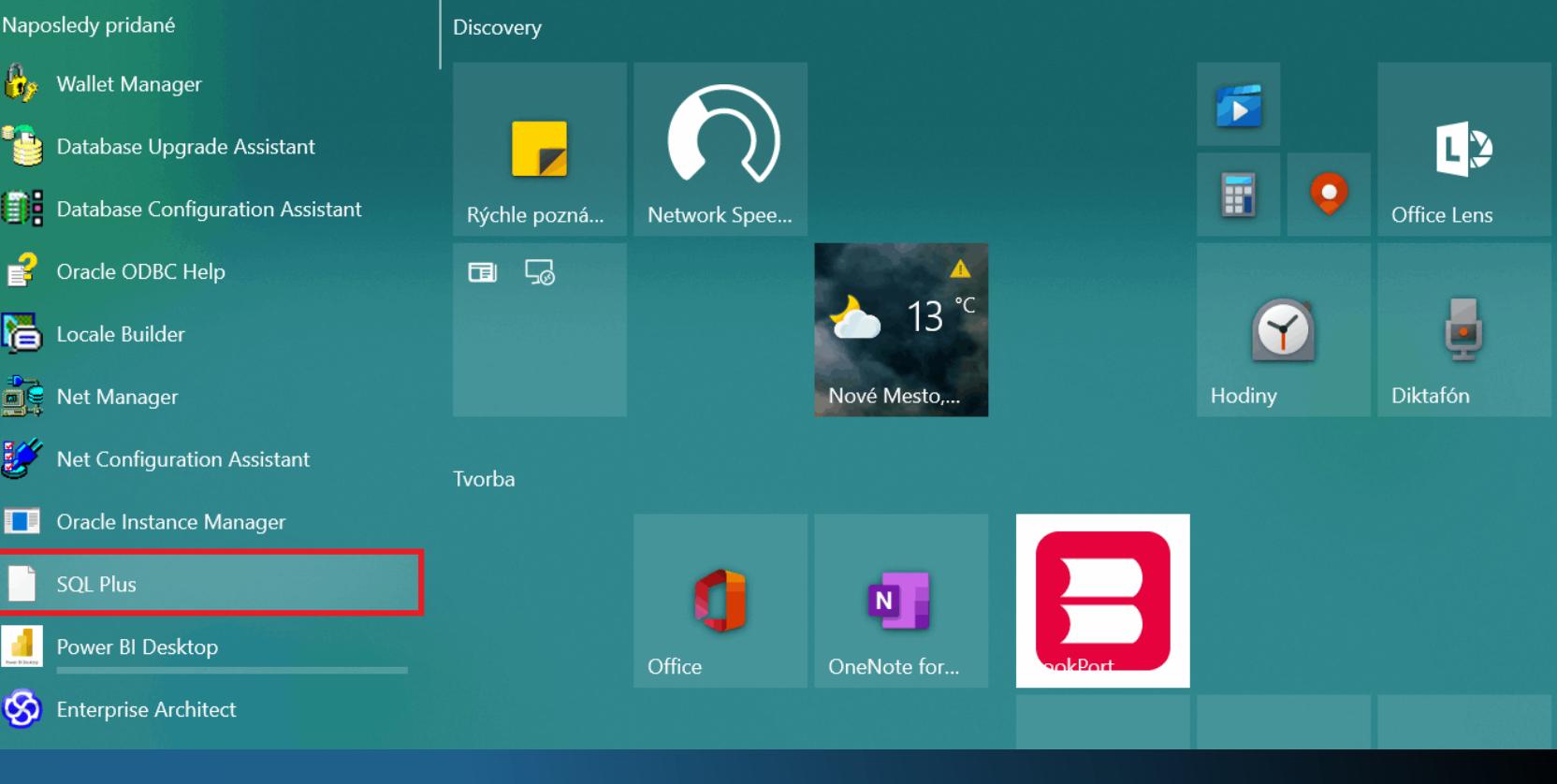
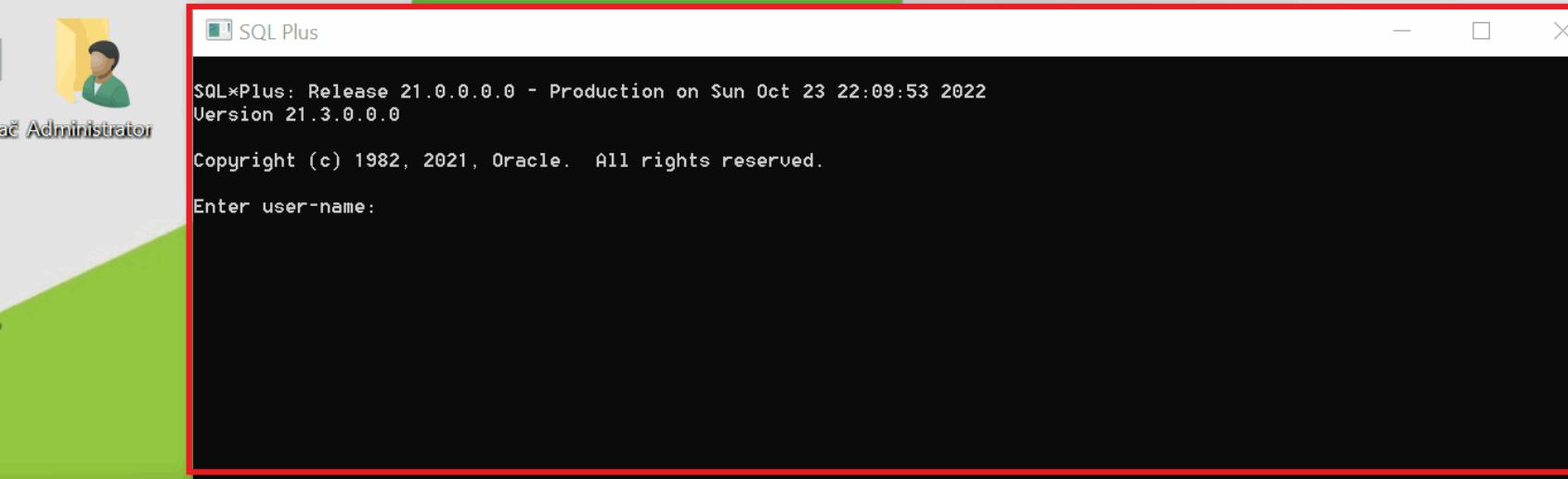
21<sup>c</sup> ORACLE  
Database  
Express Edition



# Localhost a Porty

- localhost:5500/em
- localhost:5521/exepdb1
- localhost:1521/xepdb1
- localhost:1521





SQL\*Plus: Release 21.0.0.0.0 - Production on Sun Oct 23 22:13:10 2022  
Version 21.3.0.0.0

Copyright (c) 1982, 2021, Oracle. All rights reserved.

Enter user-name: system

Enter password:

Last Successful login time: Sun Oct 23 2022 22:12:41 +02:00

Connected to:

Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production  
Version 21.3.0.0.0

SQL> help

HELP

----

Accesses this command line help system. Enter HELP INDEX or ? INDEX  
for a list of topics.

You can view SQL\*Plus resources at

<http://www.oracle.com/technology/documentation/>

\*\*\*\*\*

HELP [topic]

SQL>

Select Administrator: C:\Windows\System32\cmd.exe - sqlplus "/ as sysdba"

Microsoft Windows [Version 10.0.19043.1826]  
(c) Microsoft Corporation. Všetky práva vyhradené.

Rozloženie: 22.25.59.0, Verzia: 2022-08-05, 00:38:51...

C:\Windows\system32>sqlplus "/ as sysdba"

SQL\*Plus: Release 21.0.0.0.0 - Production on Fri Aug 5 00:39:42 2022 OracleXE213\_Win64 >

Version 21.3.0.0.0

Copyright (c) 1982, 2021, Oracle. All rights reserved.

Connected to:  
Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production  
Version 21.3.0.0.0

SQL> help index

Enter Help [topic] for help.

@	COPY	PASSWORD
@@	DEFINE	PAUSE
/	DEL	PRINT
ACCEPT	DESCRIBE	PROMPT
APPEND	DISCONNECT	QUIT
ARCHIVE LOG	EDIT	RECOVER
ATTRIBUTE	EXECUTE	REMARK
BREAK	EXIT	REPFOOTER
BTITLE	GET	REPHEADER
CHANGE	HELP	RESERVED WORDS (SQL)
CLEAR	HISTORY	RESERVED WORDS (PL/SQL)
COLUMN	HOST	RUN
COMPUTE	INPUT	SAVE
CONNECT	LIST	SET

Súbor Domov Zdieľať Zobrazit Nástroje aplikácií Spravovať OracleXE213\_Win64

Prípnut' na panel Kopírovať Prilepiť Vystrhnúť Kopírovať cestu Premiestniť do Kopírovať do Odstrániť Prenemenovať Nový priečinok Schránka Usporadovať Nové Vlastnosti Jednoduchý prístup Otvoriť Vybrať Hľadať v: OracleXE213\_Win64

Názov Stav Dátum úpravy Typ Veľkosť

ISSetupPrerequisites	✓	28.9.2021 13:33	Priečinok súborov
0x040a.ini	✓	12.8.2016 13:15	Nastavenie konfigurácií
0x040c.ini	✓	12.8.2016 13:01	Nastavenie konfigurácií
0x0404.ini	✓	12.8.2016 12:56	Nastavenie konfigurácií
0x0407.ini	✓	12.8.2016 13:03	Nastavenie konfigurácií
0x0409.ini	✓	21.3.2016 12:04	Nastavenie konfigurácií
0x0410.ini	✓	12.8.2016 13:07	Nastavenie konfigurácií
0x0411.ini	✓	22.3.2016 17:57	Nastavenie konfigurácií
0x0412.ini	✓	12.8.2016 13:08	Nastavenie konfigurácií
0x0416.ini	✓	12.8.2016 13:11	Nastavenie konfigurácií
0x0804.ini	✓	12.8.2016 12:54	Nastavenie konfigurácií
1028.mst	✓	28.9.2021 14:35	Súbor MST
1031.mst	✓	28.9.2021 14:35	Súbor MST
1033.mst	✓	28.9.2021 14:35	Súbor MST
1034.mst	✓	28.9.2021 14:35	Súbor MST
1036.mst	✓	28.9.2021 14:35	Súbor MST
1040.mst	✓	28.9.2021 14:35	Súbor MST
1041.mst	✓	28.9.2021 14:35	Súbor MST
1042.mst	✓	28.9.2021 14:35	Súbor MST
1046.mst	✓	28.9.2021 14:35	Súbor MST
2052.mst	✓	28.9.2021 14:35	Súbor MST
DB.cab	✓	28.9.2021 14:52	WinRAR archiv
Oracle Database 21c Express Edition.msi	✓	28.9.2021 14:53	Balík inštalačného systému
setup.exe	✓	28.9.2021 14:53	Aplikácia
Setup.ini	✓	28.9.2021 14:36	Nastavenie konfigurácií
XEInstall.rsp	✓	28.9.2021 1:28	Súbor RSP
Reklama, Marketing, Nápady			

Položky: 26 Vybraná položka: 1, 1,24 MB K dispozícii v tomto zariadení

Popis súboru: Setup Launcher Unicode, Spoločnosť: Oracle Corporation, Verzia súboru: 21.0.0.0, Dátum vytvorenia: 4. 8. 2022 22:21, Veľkosť: 1,24 MB, Stav dostupnosť 1,24 MB

Počítač

[Database](#) / [Technologies](#) /[How-To Connect to Oracle Database 10g Express Edition](#)

## How-To Document

This How-To details how to use Oracle SQL Developer to connect to your Oracle Database 10g Express Edition (XE).

- Startup Oracle SQL Developer.
- From within the Connections navigator on the left side of the tool, right-click on **Connections**.
- Select **New Database Connection**.
- Enter the following information:
  - **Connection Name:** XE
  - **Username:** Whatever user you have created or SYS or SYSTEM if you have not created a user yet
  - **Password:** The password for your user or the default password you entered for SYS and SYSTEM
  - **Hostname:** 127.0.0.1 This is only the hostname if you are running SQL Developer on the same machine where your XE is installed.
  - **Port:** 1521
  - **SID:** XE
- Click Connect

Your Connections will be expanded for you and a SQL Worksheet will be opened on the right side of the tool against your new connection. You can click the + to the left of your new Connection to view the objects accessible to the connected user or can enter SQL and PL/SQL commands into the SQL Worksheet.



Database &gt;

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## SQL Developer

Oracle SQL Developer is a free, integrated development environment that simplifies the development and management of Oracle Database in both traditional and Cloud deployments. SQL Developer offers complete end-to-end development of your PL/SQL applications, a worksheet for running queries and scripts, a DBA console for managing the database, a reports interface, a complete data modeling solution, and a migration platform for moving your 3rd party databases to Oracle.

[Download SQL Developer](#)[Download SQL Developer Data Modeler](#)

## SQL Developer application interfaces

The World's #1 Tool for Managing your Oracle Database, Oracle SQL Developer provides users with three interfaces: Desktop, Browser, and Command Line.

### Oracle SQL Developer

Oracle SQL Developer is a free, integrated development environment that simplifies the development and management of Oracle Database. Java powered application for Windows, OS X, and Linux with + 5 Million users.

- Full featured PL/SQL IDE

### Oracle Database Actions

Formerly known as SQL Developer Web, Database Actions brings all of your favorite Oracle Database desktop tool's features and experience to your browser!

- Included in Oracle Autonomous Cloud Database

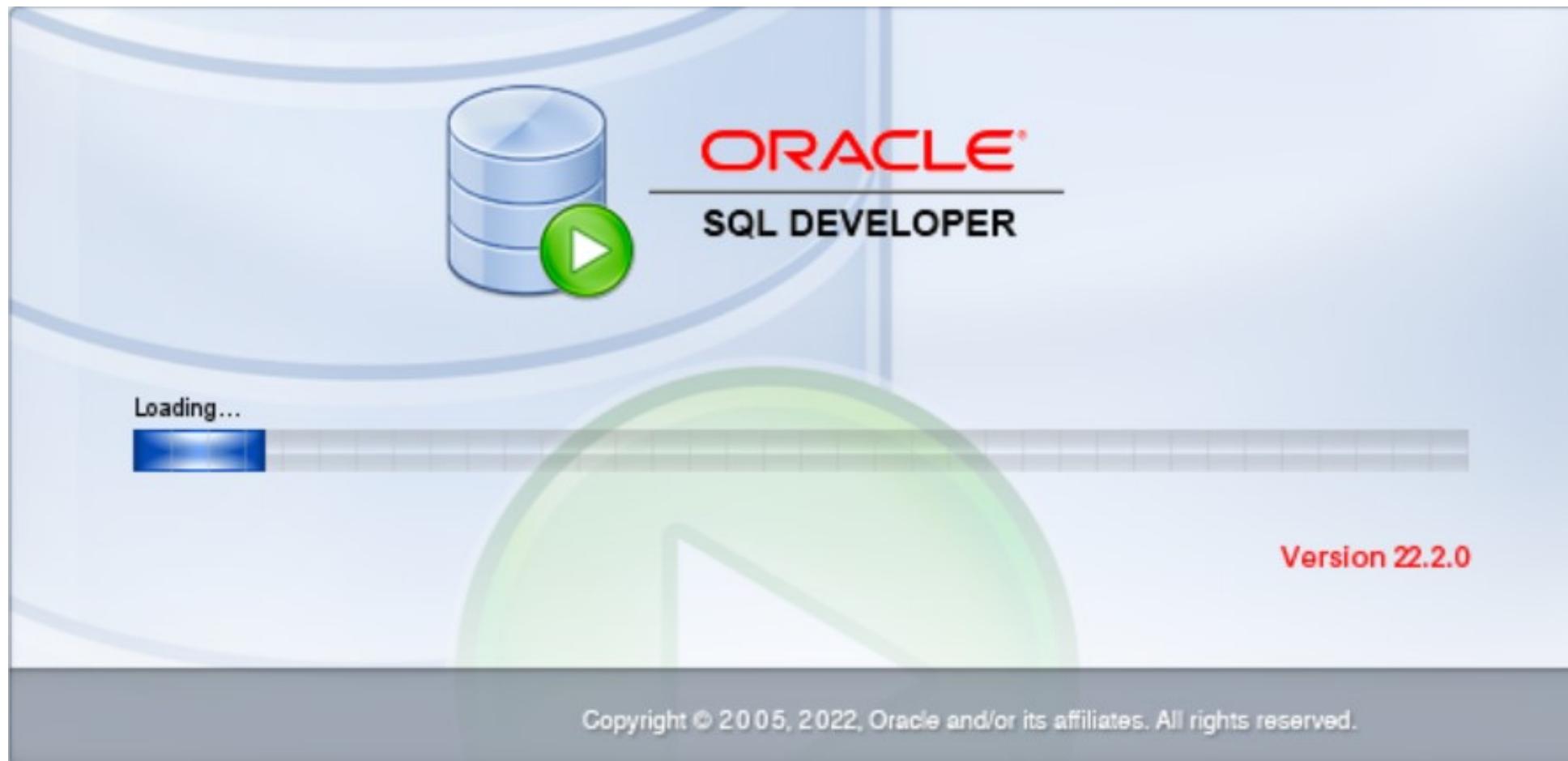
### Oracle SQLcl

Oracle SQL Developer Command Line (SQLcl) is a free and modern command line interface for the Oracle Database.

- Very small (25mb), download, unzip, and go!
- Automatic formatting (csv, xml, json, INSERTs, HTML,



# Oracle SQL Developer



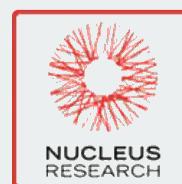
# Oracle Autonomous Database

A fully automated database service that makes it easy for all organizations to develop and deploy application workloads regardless of complexity, scale, or criticality.

Autonomous Database's converged engine supports diverse data types, simplifying application development and deployment from modeling and coding to ETL, database optimization, and data analysis. With machine-learning–driven automated tuning, scaling, and patching, Autonomous Database delivers the highest performance, availability, and security for OLTP, analytics, batch, and Internet of Things (IoT) workloads. Built on Oracle Database and Oracle Exadata, Autonomous Database is available on Oracle Cloud Infrastructure (OCI) for shared or dedicated deployments, and on-premises with Exadata Cloud@Customer and Dedicated Region Cloud@Customer.

## Introducing Oracle Database Service for Microsoft Azure

Larry Ellison and Satya Nadella have launched Oracle Database Service for Microsoft Azure, bringing the enterprise-grade performance, availability, and automation of Oracle Database to Azure customers.

[Explore Oracle Database Service for Azure](#)[Experience the service](#)

# Get Autonomous Database for Free

Build, test, and deploy free Oracle Autonomous Database instances for an unlimited time with Always Free cloud services. In addition, get US\$300 in credit and try a wide range of Oracle Cloud services for 30 days for free.

[Start for free](#)

## Getting Started with the Oracle Cloud Console

[Watch the video \(2:37\)](#)

## What's included with Always Free cloud services for Oracle Autonomous Database?\*

### Always Free cloud services

Services you can use for an unlimited time.

- Two Oracle Autonomous Databases
- Two AMD Compute VMs
- Up to 4 instances of Ampere Arm A1 Compute
- Block, Object, and Archive Storage; Load Balancer and data egress; Monitoring and Notifications



### 30-day free trial

US\$300 in free credits.

- Access to a wide range of Oracle Cloud services
- Up to eight instances across all available services
- Up to 5 TB of storage

[Start for free](#)

# Create Autonomous Database

## Provide basic information for the Autonomous Database

### Compartment

itacademy (root)

### Display name

Kurz\_Oracle\_PLSQL

A user-friendly name to help you easily identify the resource.

### Database name

KurzOraclePLSQL

The name must contain only letters and numbers, starting with a letter. Maximum of 30 characters.

### Choose a workload type

#### Data Warehouse

Built for decision support and data warehouse workloads. Fast queries over large volumes of data.

#### Transaction Processing

Built for transactional workloads. High concurrency for short-running queries and transactions.

#### JSON

Built for JSON-centric application development. Developer-friendly document APIs and native JSON storage.

#### APEX

Built for Oracle APEX application development. Creation and deployment of low-code applications, with database included.

### Choose a deployment type

#### Shared infrastructure

Run Autonomous Database on Shared Exadata Infrastructure.

#### Dedicated infrastructure

Run Autonomous Database on Dedicated Exadata Infrastructure.

## Configure the database

Always Free

Show only Always Free configuration options



**Create Autonomous Database**

[Cancel](#)

# Create Autonomous Database

## Configure the database

Always Free



Show only Always Free configuration options

Choose database version

19c

OCPU count

1

The number of OCPU cores to enable. Available cores are subject to your tenancy's service limits.

Storage (TB)

1

The amount of storage to allocate.

 OCPU auto scalingAllows systems to expand up to three times the provisioned OCPU as workload increases. [Learn more](#) about auto scaling. Storage auto scaling

Allows system to expand up to three times the reserved storage.

## Create administrator credentials

Username Read-only

ADMIN

ADMIN username cannot be edited.

Password

.....



Confirm password

.....

**Create Autonomous Database**[Cancel](#)

# Create Autonomous Database

[Help](#)

## Choose network access

### Access type

#### Secure access from everywhere

Allow users with database credentials to access the database from the internet.



#### Secure access from allowed IPs and VCNs only

Restrict access to specified IP addresses and VCNs.

#### Private endpoint access only

Restrict access to a private endpoint within an OCI VCN.

### Require mutual TLS (mTLS) authentication

If you select this option, mTLS will be required to authenticate connections to your Autonomous Database.

## Choose license and Oracle Database edition

### Choose a license type

#### Bring your own license (BYOL)

Bring your organization's Oracle Database software license to the Oracle Database service. [Learn more](#).

#### License included

Subscribe to a new Oracle Database software license and the Oracle Database service.



## Provide contacts for operational notifications and announcements

### Contact Email

Enter a valid email ID



Add Contact



[Create Autonomous Database](#)

[Cancel](#)

# Kurz\_Oracle\_PLSQL

[Database Actions](#)[DB Connection](#)[Performance Hub](#)[Manage Scaling](#)[More actions ▾](#)

Autonomous Database information

[Tools](#)[Tags](#)

## General information

**Database name:** KurzOraclePLSQL**Workload type:** Transaction Processing**Compartment:** itacademy (root)**OCID:** ...et3mfq [Show](#) [Copy](#)**Created:** Mon, Oct 24, 2022, 08:28:17 UTC**OCPU count:** 1**OCPU auto scaling:** Enabled [\(i\)](#)**Storage:** 1 TB**Storage auto scaling:** Disabled [\(i\)](#)**License type:** License included**Database version:** 19c**Lifecycle state:** Provisioning [Check database availability](#)**Instance type:** Paid**Character set:** AL32UTF8**National character set:** AL16UTF16**Auto Start/Stop schedule:** Disabled [Schedule](#)**Mode:** Read/Write [Edit](#)

## Associated Services

## Infrastructure

**Dedicated infrastructure:** No

## Autonomous Data Guard [\(i\)](#)

**Status:** Disabled [Enable](#)

## Backup

**Last automatic backup:** No active backups exist for this database.**Manual backup store:** Not Configured

## Network

**Access type:** Allow secure access from everywhere**Access control list:** Disabled [Edit](#)**Mutual TLS (mTLS) authentication:** Required [Edit](#) [\(i\)](#)

## Maintenance [\(i\)](#)

**Patch level:** Regular [\(i\)](#)**Customer contacts:** None [\(i\)](#) [Manage](#)

## Encryption

PROVISIONING





## Kurz\_Oracle\_PLSQL

Database Actions DB Connection Performance Hub Manage Scaling More actions ▾

Autonomous Database information

Tools Tags

### General information

**Database name:** KurzOraclePLSQL

**Workload type:** Transaction Processing

**Compartment:** itacademy (root)

**OCID:** ...et3mfq [Show](#) [Copy](#)

**Created:** Mon, Oct 24, 2022, 08:28:17 UTC

**OCPU count:** 1

**OCPU auto scaling:** Enabled [\(i\)](#)

**Storage:** 1 TB

**Storage auto scaling:** Disabled [\(i\)](#)

**License type:** License included

**Database version:** 19c

**Lifecycle state:** Available [Check database availability](#)

**Instance type:** Paid

**Character set:** AL32UTF8

**National character set:** AL16UTF16

**Auto Start/Stop schedule:** Disabled [Schedule](#)

**Mode:** Read/Write [Edit](#)

### Associated Services

### Infrastructure

**Dedicated infrastructure:** No

### Autonomous Data Guard [\(i\)](#)

**Status:** Disabled [Enable](#)

### Backup

**Last automatic backup:** No active backups exist for this database.

**Manual backup store:** Not Configured

### Network

**Access type:** Allow secure access from everywhere

**Access control list:** Disabled [Edit](#)

**Mutual TLS (mTLS) authentication:** Required [Edit](#) [\(i\)](#)

### Maintenance [\(i\)](#)

**Patch level:** Regular [\(i\)](#)

**Next maintenance:** Sat, Oct 29, 2022, 18:00:00 UTC - 20:00:00 UTC [View History](#)

**Customer contacts:** None [\(i\)](#) [Manage](#)



## Database Connection

## Download Wallet

[Help](#)

Connections to your Autonomous Database are secured, and can be authorized using TLS or mTLS authentication options. TLS authentication is easier to use, provides better connection latency, and does not require you to download client credentials (wallet) if any of these is true for your connections:

- You are using JDBC Thin Client (version 12.2.0.1 or higher) with JDK 8(u163+) or higher.
- You are using the Python python-oracledb driver.
- You are using ODP.NET version 19.14 (or higher), or 21.5 (or higher).
- You are using an Oracle Call Interface based driver with Oracle Client libraries version 19.14 (or higher), or 21.5 (or higher).

[Learn more](#) about TLS authentication and how to enable it.

Please create a password for this wallet. Some database clients will require that you provide both the wallet and password to connect to your database (other clients will auto-login using the wallet without a password).

Password



Confirm password

[Download](#)[Cancel](#)

## TLS Authentication

Mutual TLS

TNS Name

f861dmqmrefdg3zg\_high

Connection String

...dwood City, ST=California, C=US))) [Show](#) [Copy](#)

f861dmqmrefdg3zg\_low

...dwood City, ST=California, C=US))) [Show](#) [Copy](#)[Close](#)

**Chyba**

Systémová chyba. Zopakujte akciu. Ak táto chyba pretrváva, kontaktujte administrátora.

Verify your email to create your Oracle Cloud account - Správa (HTML)

Súbor Správa Vývojár Pomocník Povedzte, čo chcete urobiť

Odstrániť Archivovať Premiestniť Odpovedať všetkým Odpovedať Oznaciť ako neprečítané Hľadať Čítať nahlas Imerzná čítačka Lupa ...

Verify your email to create your Oracle Cloud account

OC Oracle Cloud <noreply@verify.signup.us-ashburn-1.oci.oraclecloud.com> Komu miroslav.reiter@it-academy.sk

Like Odpovedať Odpovedať všetkým Preposlat' ...

ORACLE

Oracle Cloud Free Tier

## Verify your email address



Hello Miroslav,

Thanks for your interest in creating an Oracle Cloud account. To create your account, please verify your email address by clicking below.

[Verify email](#)

Thanks,

The Oracle Cloud Team

ORACLE Cloud Infrastructure

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Start



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## Your Oracle Cloud Account is Fully Provisioned



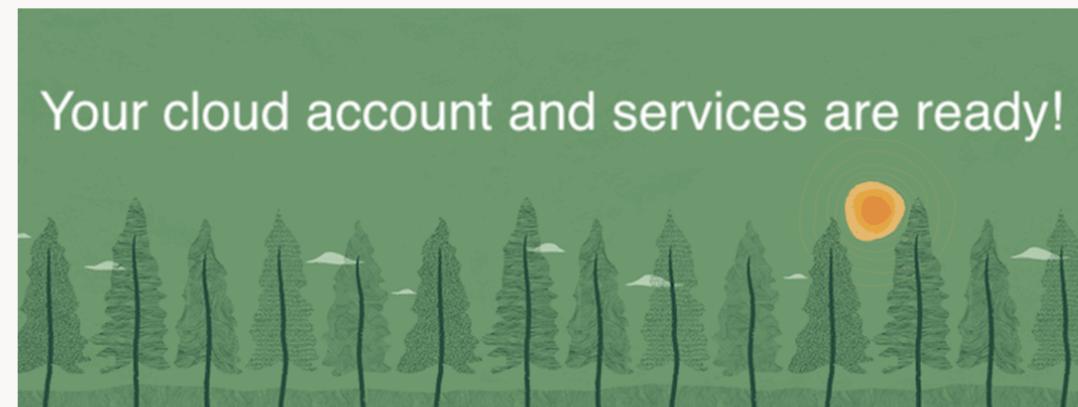
Oracle Cloud <no-reply@organizations.oci.oraclecloud.com>

Komu riaditeľ@it-academy.sk

(i) Ak sa vyskytnú problémy so zobrazením tejto správy, kliknutím sem ju zobrazte vo webovom prehliadači.

Like Odpovedať Odpovedať všetkým Preposlať ...

# ORACLE



Hi Miroslav,

Your new cloud account **itacademy** is now fully set up! You can now sign into your cloud account.

[Sign In](#)

**ORACLE**  
Cloud Infrastructure

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## New Support Identifier granted to you



Oracle\_Customer\_Support-notification\_ww@oracle.com <no-reply@oracle.com>  
Komu riaditeľ@it-academy.sk

Like Odpovedať Odpovedať všetkým Preposlať ...

ut 18. 10. 2022 2:22

### ORACLE Support

You have been associated to a cloud subscription and granted access to a Support Identifier for Oracle Support.

You have been assigned the role of Customer User Administrator (CUA) for this Support Identifier based on your Service Administrator role from the Cloud subscription and contract. As the CUA, you will be able to manage user access to Support via the My Oracle Support Portal at [My Oracle Support](#).

For more information about My Oracle Support, please use this link [My Oracle Support FAQ](#).

For more information about being a Customer User Administrator, please use this link [CUA Roles and Responsibilities](#).

*Please do not reply to this email. This mailbox does not allow incoming messages.*

Oracle SQL Developer

File Edit View Navigate Run Team Tools Window Help

Connections

Oracle Connections Database Schema Service Connections

Welcome Page

ORACLE SQL Developer

Database Connection

Recent Databases Detected

Click to add the connection  
No TNS entries found in {USER Home dir=C:\Users\Administrator,  
ORACLE\_HOME=C:\app\Administrator\product\21c\dbhomeXE\network\admin}

Load a TNS file

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SQLcl - The power of SQL Developer in a CLI

Oracle Live SQL - Learn and share SQL, for free.

ORDS - REST Enable the Oracle Database

Version: 22.2.0.173.2018

Oracle SQL Developer

File Edit View Navigate Run Team Tools Window Help

Connections X

Oracle Connections

- Kurz Oracle PL-SQL
- Oracle Free Cloud Database
  - Tables (Filtered)
  - Views
  - Indexes
  - Packages
  - Procedures
  - Functions
  - Operators
  - Queues
  - Queues Tables
  - Triggers
  - Types
  - Sequences
  - REST Data Services
  - Materialized Views
  - Materialized View Logs
  - Synonyms
  - Public Synonyms
  - Database Links
  - Public Database Links
  - Directories
  - Editions
  - Application Express
  - OLAP Option
  - Analytic Views
  - Scheduler
  - Property Graph
  - RDF Semantic Graph
  - Recycle Bin
  - Cloud Deployments
  - Other Users
- Database Schema Service Connections

Reports X

All Reports

- Analytic View Reports
- Data Dictionary Reports
- Data Modeler Reports
- OLAP Reports
- TimesTen Reports
- User Defined Reports

Welcome Page X Oracle Free Cloud Database X Kurz Oracle PL-SQL X

Worksheet Query Builder

New / Select Database Connection

Connection Name	Connection Details
Kurz Oracle PL-SQL	admin@kurzoracleplsql_high
Oracle Free Cloud Database	admin@f861dmqmrefdg3zg_high

Name: Kurz Oracle PL-SQL

Database Type: Oracle

User Info | Proxy User

Authentication Type: Default

Username: admin

Password: [REDACTED]

Role: default

Save Password

Connection Type: Cloud Wallet

Details | Advanced | Proxy

Configuration File: C:\Users\Administrator\Documents\Oracle Wallet\Wallet\_KurzOrac

Browse...

Service: kurzoracleplsql\_high

Configure OSS Classic

Status :

Pomoc

Save Clear Test Connect Zrušit'

Snippets X

Aggregate Functions

- COUNT(\*)
- COUNT([ALL | DISTINCT] expr)
- MAX(expr)
- MEDIAN(expr)
- MIN(expr)
- STDDEV(expr)
- SUM(expr)
- VARIANCE(expr)

Start an identifier with the Control key down to perform "Go to Declaration"



## Connections X



Oracle Connections

Kurz Oracle PL-SQL

Oracle Free Cloud Database

Tables (Filtered)

Views

Indexes

Packages

Procedures

Functions

Operators

Queues

Queues Tables

Triggers

Types

Sequences

REST Data Services

Materialized Views

Materialized View Logs

Synonyms

Public Synonyms

Database Links

Public Database Links

Directories

Editions

Application Express

OLAP Option

Analytic Views

Scheduler

Property Graph

RDF Semantic Graph

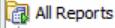
Recycle Bin

Cloud Deployments

Other Users

## Database Schema Service Connections

## Reports X



All Reports

Analytic View Reports

Data Dictionary Reports

Data Modeler Reports

OLAP Reports

TimesTen Reports

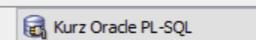
User Defined Reports

## Welcome Page X Oracle Free Cloud Database X Kurz Oracle PL-SQL X



## Worksheet Query Builder

```
1
CREATE PROCEDURE procedure_name [ (parameter) ] ...
...
CREATE TABLE table ()
CREATE FUNCTION function_name [ (parameter) ] ...
```



## Kurz Oracle PL-SQL

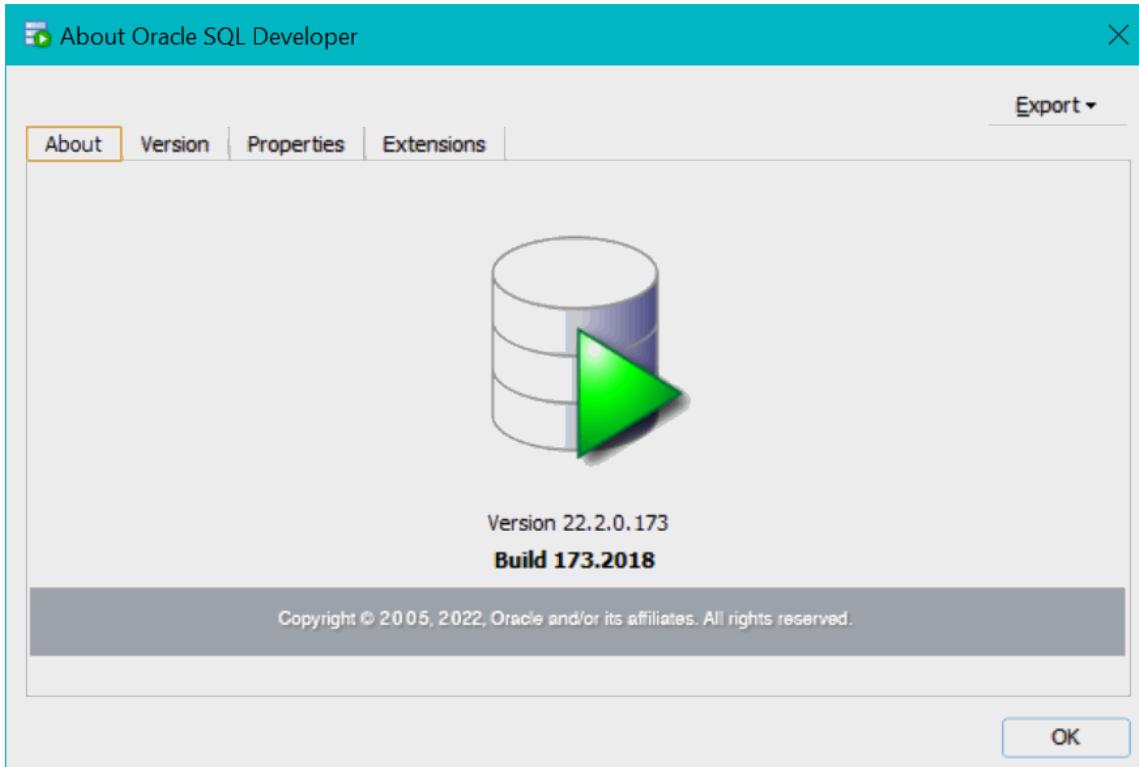
## Snippets X



## Aggregate Functions

COUNT(\*)  
COUNT([ALL | DISTINCT] expr)  
MAX(expr)  
MEDIAN(expr)  
MIN(expr)  
STDDEV(expr)  
SUM(expr)  
VARIANCE(expr)

# Verzie a Java



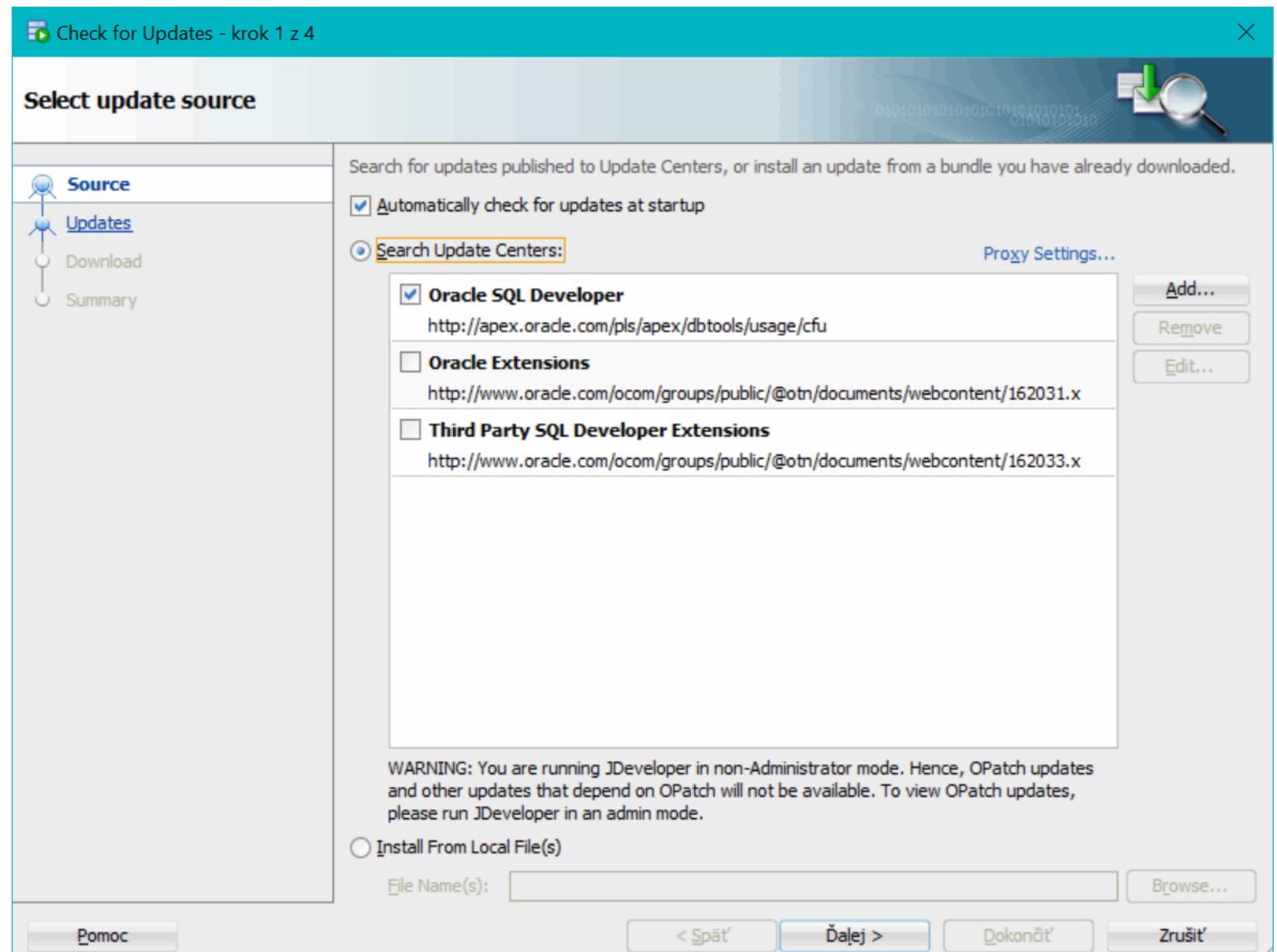
The screenshot shows the 'About Oracle SQL Developer' dialog with a table displaying system information. The table has two columns: 'Component' and 'Version'. The data is as follows:

Component	Version
Java(TM) Platform	11.0.15.1
Oracle IDE	22.2.0.173.2018

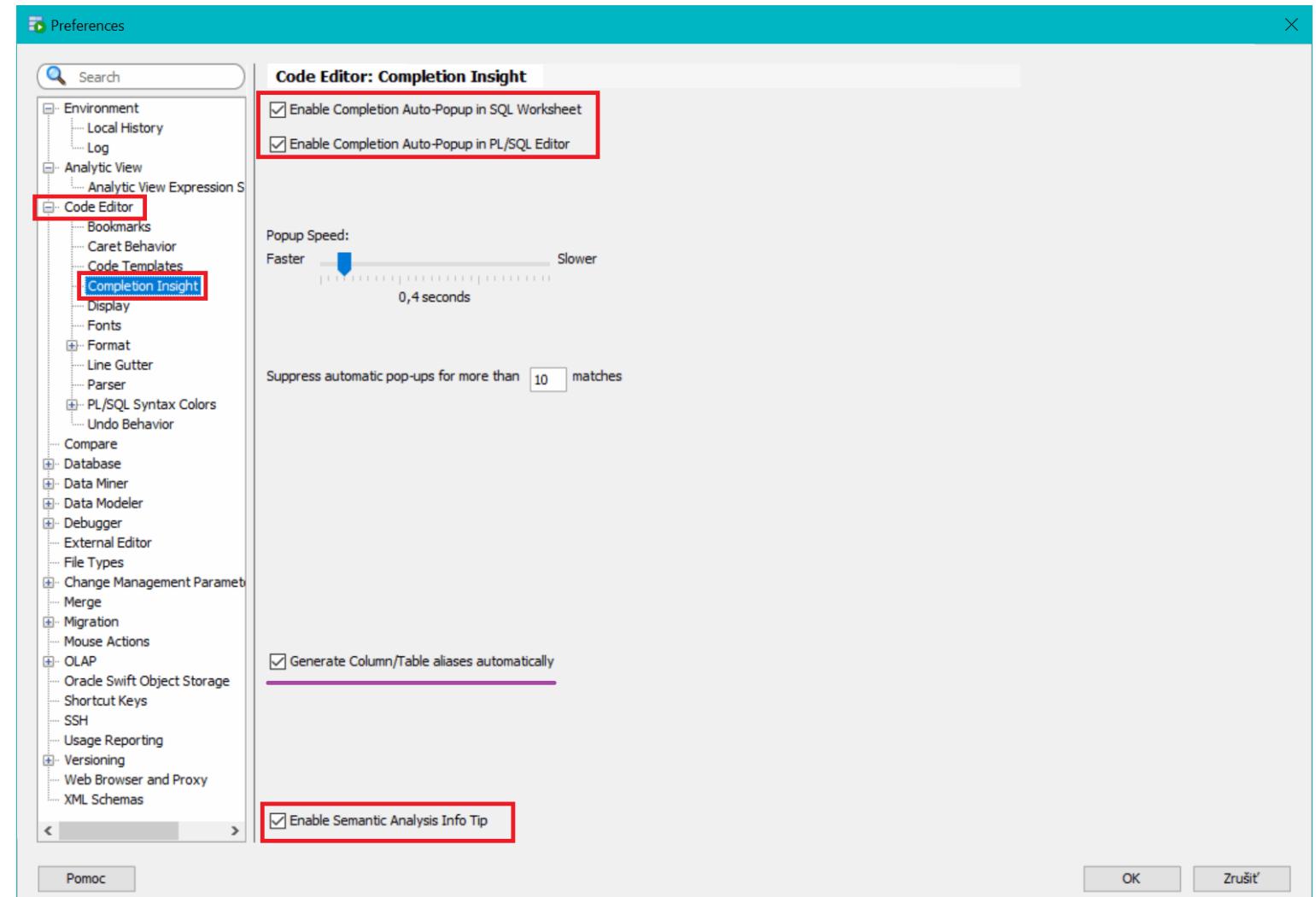
On the right side of the dialog is an 'Export' button. At the bottom is an 'OK' button.

# Aktualizácie

## Vypni si Automatické Aktualizácie



# Zabudované a Vlastné Šablóny



# Zabudované a Vlastné Šablóny

The image displays two separate windows of the Oracle SQL Template Editor, each showing a template for either a stored procedure or a function. Both windows have a teal header bar with the title 'Template Editor' and a close button ('X').

**Left Window (Procedure Template):**

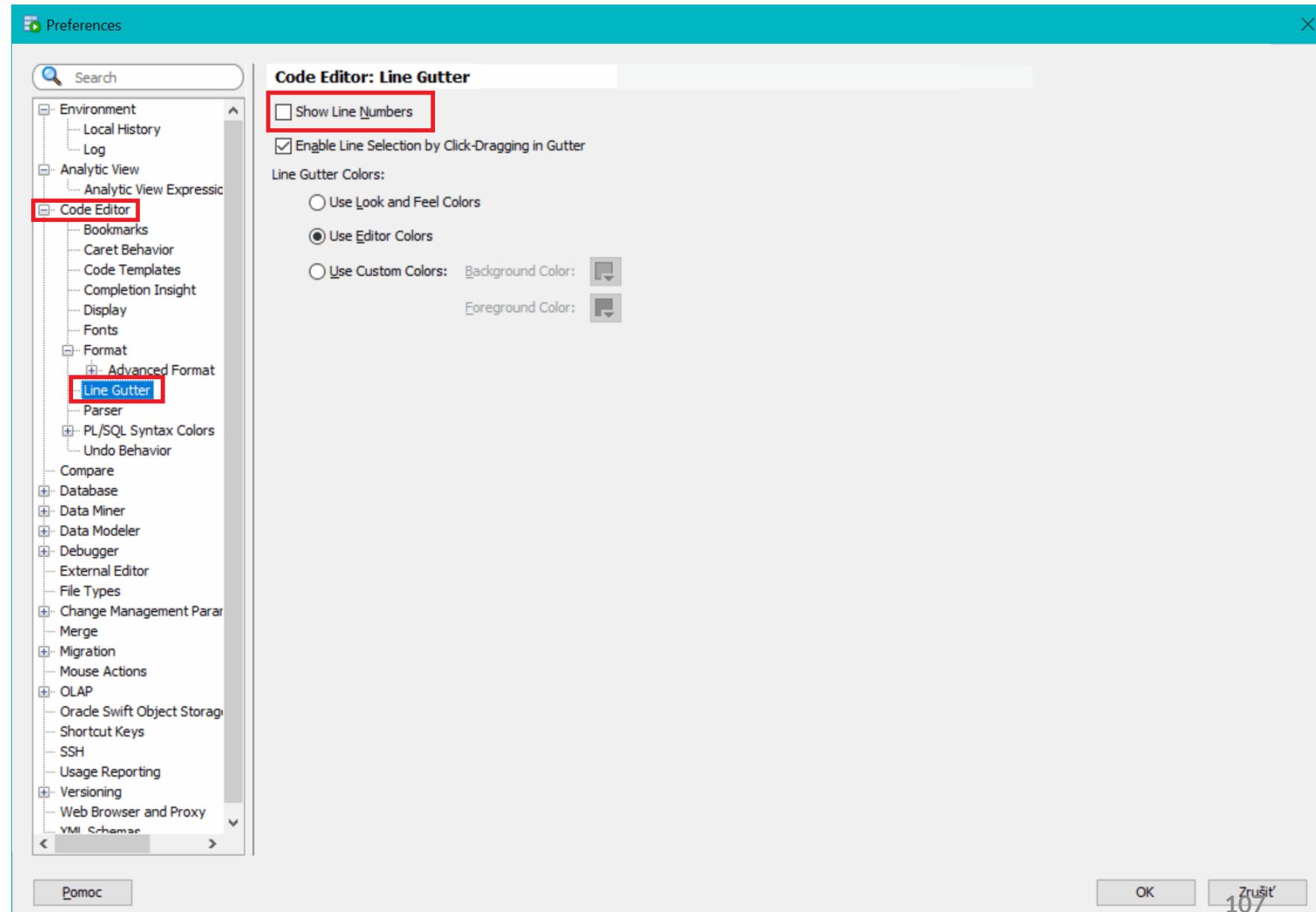
```
CREATE PROCEDURE procedure_name
  [ (parameter) ]
IS
  [declaration_section]
BEGIN
  ...
END procedure_name;
```

**Right Window (Function Template):**

```
CREATE FUNCTION function_name
  [ (parameter) ]
RETURN return_datatype
IS
  [declaration_section]
BEGIN
  ...
END function_name;
```

Both windows feature a light yellow horizontal bar at the bottom of their respective code areas. Each window has a 'Zatvorit' (Close) button in its bottom right corner.

# Čísla Riadkov



# NLS

Preferences

Database: NLS

Language: SLOVAK

Sort: SLOVAK

Date Language: SLOVAK

Date Format: DD.MM.RR

Timestamp Format: DD.MM.RR HH24:MI:SSXFF

Timestamp TZ Format: DD.MM.RR HH24:MI:SSXFF TZR

Decimal Separator: ,

Currency: €

Length: BYTE

Group Separator: .

ISO Currency: SLOVAKIA

Skip NLS Settings   [Default Values](#)

**Database**

- Advanced
- Autotrace/Explain Plan
- Drag And Drop
- Instance Viewer
- Licensing
- Navigation Filter
- NLS**
- Object Viewer
- PL/SQL Compiler
- Reports
- Third Party JDBC Driver
- User Defined Extension
- Utilities
- Worksheet

Pomoc

**Oracle's National Language Support (NLS) architecture allows you to store, process, and retrieve data in native languages**

Multilingual Database

French Data

Japanese Data

German Data

French Data

Japanese Data

# Podporované Typy Súborov

Preferences

Search

- Caret Behavior
- Code Templates
- Completion Insight
- Display
- Fonts
- Format
  - Advanced Format
  - Line Gutter
  - Parser
- PL/SQL Syntax Colors
  - PL/SQL Custom Sy
- Undo Behavior
- Compare
- Database
  - Advanced
  - Autotrace/Explain Plan
  - Drag And Drop
  - Instance Viewer
  - Licensing
  - Navigation Filter
  - NLS
  - Object Viewer
  - PL/SQL Compiler
  - Reports
  - Third Party JDBC Driver
  - User Defined Extension
- Utilities
  - Worksheet
- Data Miner
- Data Modeler
- Debugger
- External Editor
- File Types**
- Change Management Parar
- Merge
- Migration
- Mouse Actions
- OLAP
- Oracle Swift Object Storage
- Shortcut Keys
- SSH
- Usage Reporting
- Versioning
  - Git
    - Comment Template
    - General
    - Version Tools
  - Subversion
  - Web Browser and Proxy

## File Types

File Types Default Editors

Extension	File Type	Open with SQL Developer
.arbori	Arbori	
.class	Java Class	
.dif	DiffEditorNode	
.diff	Patch File	
.ear	Archive	
.gif	Image	
.help	Help Topic	
.helpT	Help Topic	
.jar	Archive	
.java	Java Source	
.jdk	JDK	
.jmod	Archive	
.jpeg	Image	
.jpg	Image	
.jpr	Project	
.jws	Application	
.ktr	PL/SQL	
.library	Library	
.patch	Patch File	
.plb	PL/SQL	
.plh	PL/SQL	
.pks	PL/SQL	
.plb	PL/SQL	
.pls	PL/SQL	
.png	Image	
.rar	Archive	
.sql	SQL Script	
.text	Text Document	
.trc	SQL Trace	
.txt	Text Document	
.war	Archive	
.xml	XML Document	
.zip	Archive	

Add...

Remove

### Details for '.arbori' Extension

File Type:

Arbori

Content Type:  Text  Binary

Open with SQL Developer

OK

Zrušit'

Pomoc

Oracle SQL Developer : Welcome Page

File Edit View Navigate Run Team Tools Window Help

Connections X

- + Oracle Connections
- Database Schema Service Connections

Version: 22.2.0.173.2018

Data Modeler >

- Database Copy...
- Database Diff...
- Database Export...
- Migration
- Monitor Sessions...
- Real Time SQL Monitor...
- SQL Worksheet Alt+F10
- Data Miner
- OLAP > Databases Detected
- REST Data Services

Quick Action... Ctrl+Alt+A

External Tools...

Features...

Preferences...

Getting Started

Get a Database Information Tutorials Demos Training

- Oracle VirtualBox Appliance
- Docker Images
- Oracle Database XE

Create a Connection Manually

Reports X

All Reports

- Analytic View Reports
- Data Dictionary Reports
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Feature Screenshots

The SQL Worksheet allows you to run queries and scripts, and offers a code insight feature to help you auto-complete your code.

Oracle SQL Developer Welcome Page

Version: 22.2.0.173.2018

**Snippets X**

Aggregate Functions

- COUNT(\*)
- COUNT([ALL | DISTINCT] expr)
- MAX(expr)
- MEDIAN(expr)
- MIN(expr)
- STDDEV(expr)
- SUM(expr)
- VARIANCE(expr)

**Database Connection**

Recent Databases Detected

Click to add the connection

No TNS entries found in {USER Home dir=C:\Users\Administrator, ORACLE\_HOME=C:\app\Administrator\product\21c\dbhomeXE\network\admin}

Create a Connection Manually

**Getting Started**

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- Docker Images
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- Oracle Live SQL - Learn and share SQL, for free.
- ORDS - REST Enable the Oracle Database

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**Feature Screenshots**

The SQL Worksheet allows you to run queries and scripts, and offers a code insight feature to help you auto-complete your code.

**Snippets**

Task Progress

Thumbnail Ctrl+Shift+T

TimesTen Scaleout

Editor

Show Toolbars

Show Status Bar

Názov	Dátum úpravy	Typ	Veľkosť
DefaultWorkspace	18. 10. 2022 21:59	Priečinok súborov	
projects	18. 10. 2022 22:12	Priečinok súborov	
ide.properties	21. 10. 2022 14:57	Properties file	5 kB
preferences.xml	21. 10. 2022 14:57	Súbor XML	1 kB
product-preferences.xml	21. 10. 2022 14:57	Súbor XML	60 kB
System.sys	18. 10. 2022 22:11	Systémový súbor	2 kB

C:\Users\Administrator\AppData\Roaming\SQL Developer\system22.2.1.234.1810\o.sqldeveloper\ide.properties - Notepad++

Súbor Úpravy Hľadať Zobrazenie Kódovanie Jazyk Nastavenia Nástroje Makro Spustiť Plugins Window ?

Poznámky, Pokyny.txt ide.properties

```
23 # Ide.FontSize=11
24 #
25 # To modify the font size for a particular look-and-feel in all
26 # locales, set the Ide.FontSize.<lafID> property. For example:
27 # Ide.FontSize.Aqua=11
28 # Ide.FontSize.Metal=11
29 # Ide.FontSize.Motif=11
30 # Ide.FontSize.Oracle=11
31 # Ide.FontSize.Windows=11
32 #
33 # To modify the font size for a particular locale under all
34 # look-and-feels, set the Ide.FontSize.<languageID> property. For
35 # example:
36 # Ide.FontSize.en=11
37 # Ide.FontSize.fr=11
```

Odkomentovať, odstrániť #

Properties file length : 4 719 lines : 129 Ln : 31 Col : 5 Sel : 23 | 1 Windows (CR LF) UTF-8 IN

# SQL (DML) v PL/SQL

- **SELECT** – vyber/dopyt dát
  - **INSERT** – vloženie dát
  - **UPDATE** – aktualizácia dát
  - **DELETE** – zmazanie dát
- 
- Plná podpora príkazov **SELECT, INSERT, UPDATE** a **DELETE**
  - Namiesto **ktorékolvek konštanty v SQL** je možné použiť **PL/SQL premennú**
  - Ak **identifikátor nie je stĺpcom databázy** je posudzovaný ako **PL/SQL identifikátor**
  - Príkazy SQL nesmú byť súčasťou výrazu



**C      R      U      D**

# SQL (Select ... INTO) v PL/SQL

- Príkaz **SELECT** v PL/SQL **musí obsahovať klauzulu INTO**
- **SELECT ... INTO** musí vracat **iba 1 riadok** (nula alebo viac riadkov vracajú chybu)
- **Pre viacriadkové výbery používame kurzory**

**DECLARE**

    l\_customer\_name customers.name%TYPE;

**BEGIN**

**SELECT** name **INTO** l\_customer\_name  
        **FROM** customers **WHERE** customer\_id =  
        100;

    dbms\_output.put\_line(v\_customer\_name);

**END;**

/

# SQL jazyk – DDL

- **CREATE** – vytvorenie databázového objektu
- **ALTER** – úprava objektu
- **TRUNCATE** – vyčistenie obsahu objektu
- **DROP** – zmazanie objektu
- Objektom môže byť
  - Databáza, tabuľka, pohľad na dátu, ...

# SQL jazyk – Operátory

---

=, <>

---

>, <, <=, >=

---

**BETWEEN**

---

**LIKE**

---

**IN**

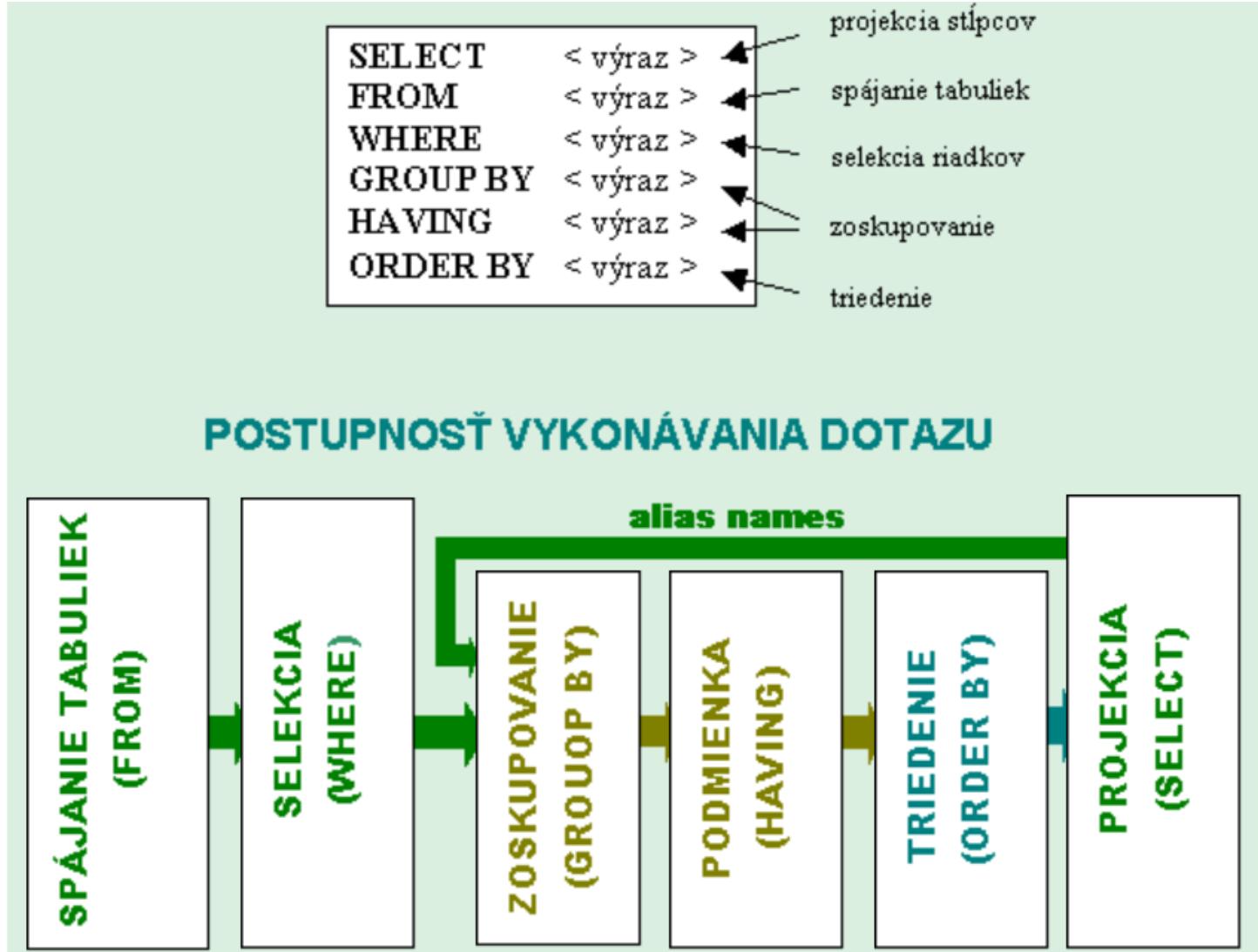
---

**IS, IS NOT**

---

**AS**

# Štruktúra SQL dopytu



# SQL jazyk – 3-hodnotová logika

Možné výsledky predikátu:

- **True**
- **False**
- **NULL**

		B		
		TRUE	FALSE	NULL
A	TRUE	TRUE	TRUE	TRUE
	FALSE	TRUE	FALSE	Neznáma
	NULL	TRUE	Neznáma	Neznáma

		B		
		TRUE	FALSE	NULL
A	TRUE	TRUE	FALSE	Neznáma
	FALSE	FALSE	FALSE	FALSE
	NULL	Neznáma	FALSE	Neznáma

q	NOT q
TRUE	FALSE
FALSE	TRUE
NULL	Neznáma

# SQL jazyk - DCL

**GRANT** - pridelenie práv

**REVOKE** - odňatie práv

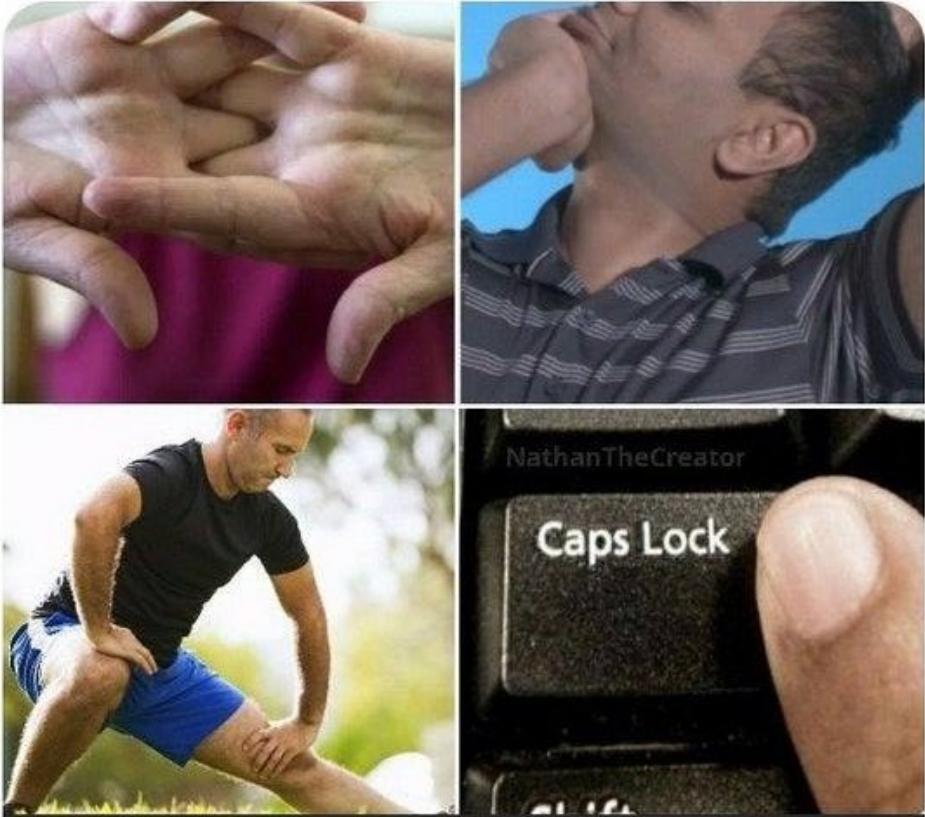
DBA, ADMIN, SYS



# SQL jazyk - Transakcie

- Niektoré DB podporujú **transakcie**
- Uzatvárajú skupiny DML príkazov do atomických celkov
- Atomický celok sa aplikuje alebo zahodí - **COMMIT**, **ROLLBACK**
- Možnosť uloženia medzivýsledku - **SAVEPOINT**

# SQL programmers be like



## Vlastnosti SQL

Medzery navyše sú ignorované

Nie je senzitívny na veľkosť písmen

Príkazy sú oddelované bodkočiarkou

Klauzuly sú špeciálne kľúčové slová

Výrazy vracajú skalárne hodnoty alebo tabuľky

3-hodnotová logika

# Čo sa oplatí prečítať?

## Slovensko a česko

- Albatrosmedia
- Kopp
- Grada
- Wolters Kluwer
- BEN
- Veda

## Zahraničie

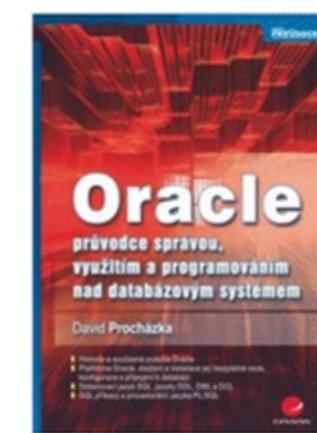
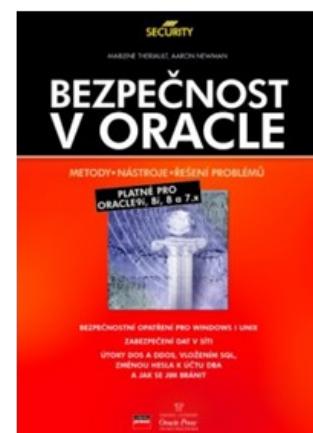
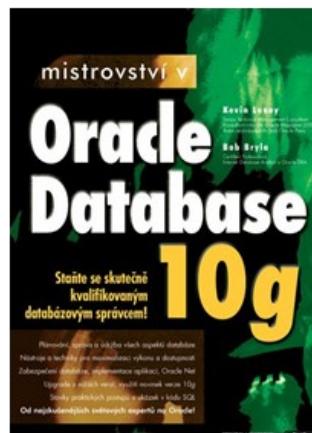
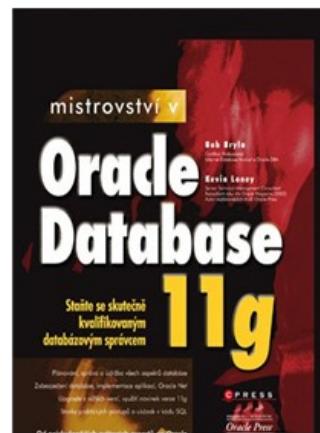
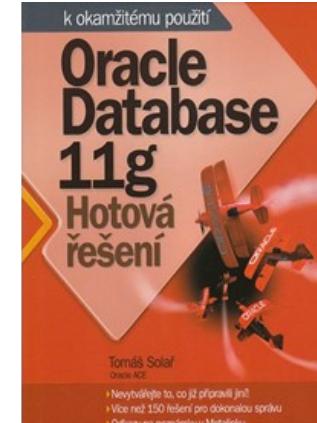
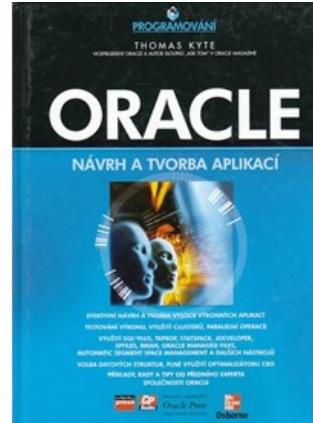
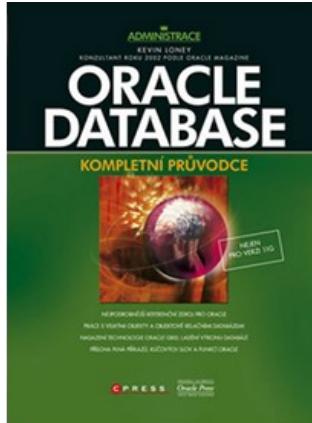
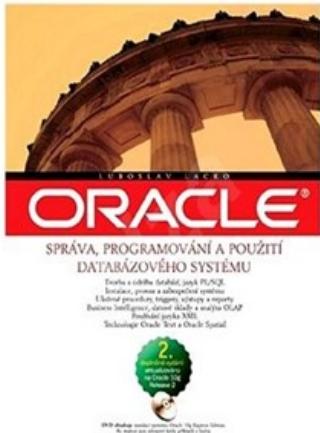
- O'Reilly
- Manning
- Packt
- Apress
- Wiley
- No Starch Press

## YouTube tutoriály

- [IT Academy](#)

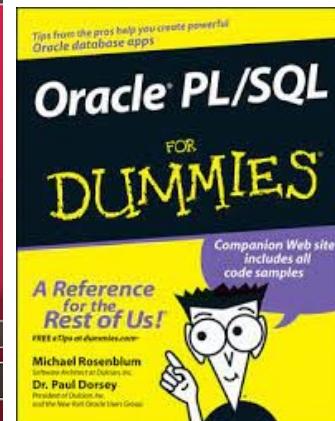
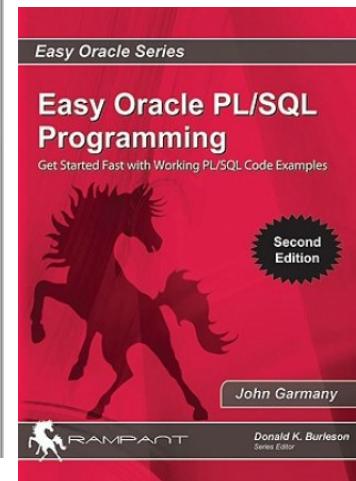
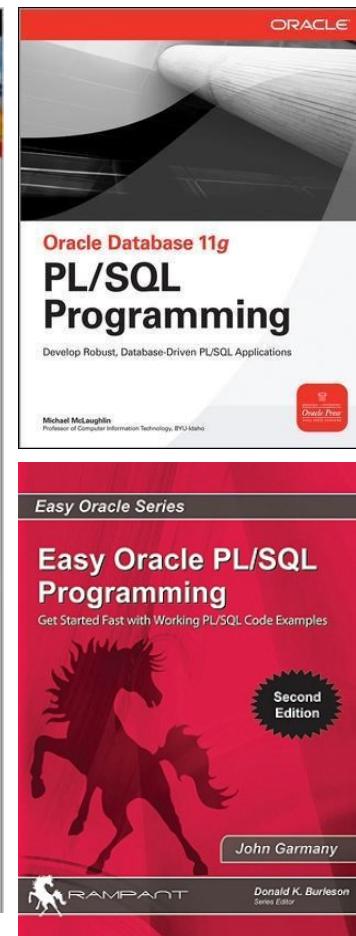
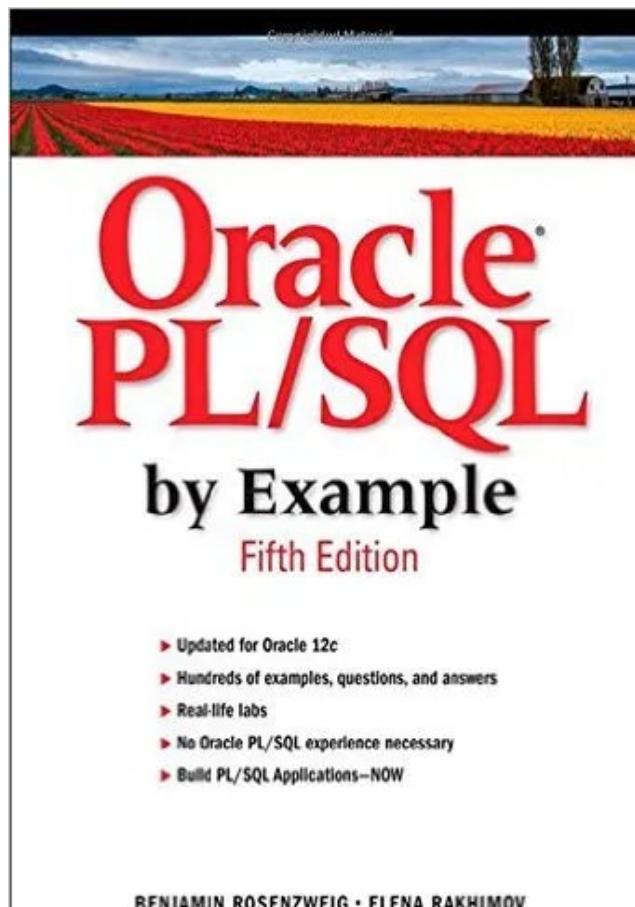
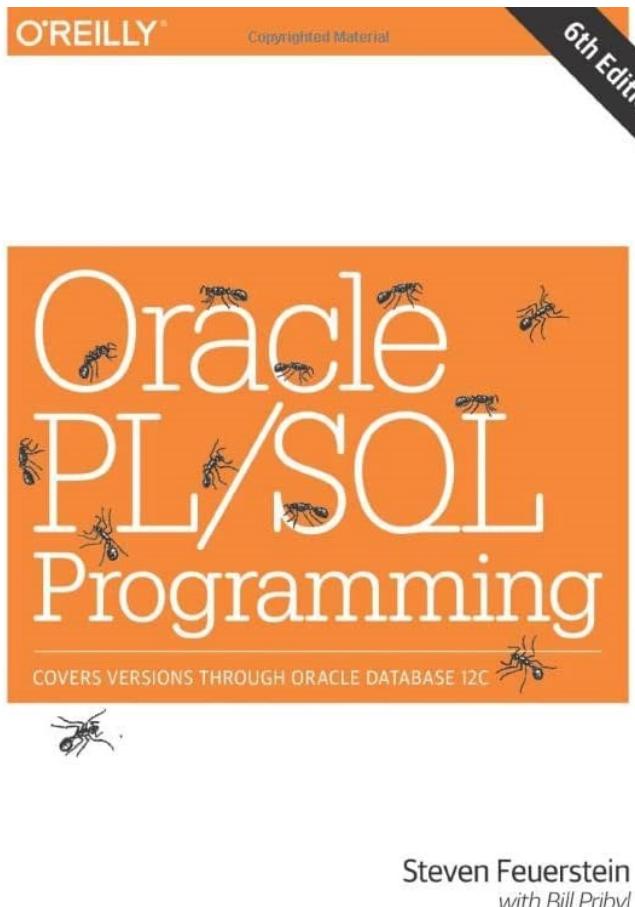
Oracle

# Čo sa oplatí/neoplatí prečítať SK/CZ?



Hotová Rešení

# Čo sa oplatí/neoplatí prečítať EN?



Oreilly a Oracle

# I am programmer



I have Life



I have  
stack**overflow**

Home

PUBLIC

Questions

**Tags**

Users

Companies

COLLECTIVES

Explore Collectives

TEAMS

Create free Team

# Tags

A tag is a keyword or label that categorizes your question with other, similar questions. Using the right tags makes it easier for others to find and answer your question.

[Show all tag synonyms](#)

plsql

Popular

Name

New

plsql	27585 questions	6 asked today, 40 this week
plsqldeveloper	1541 questions	6 asked this month, 87 this year
plsql-package	216 questions	45 asked this year
mod-plsql	34 questions	2 asked this year
utplsql	19 questions	2 asked this year
plsql-psp	15 questions	2 asked this year
hive-hplsql	9 questions	1 asked this year
nzplsql	7 questions	1 asked this year
plsql-gateway	1 question	

**STACK OVERFLOW**[Questions](#)[Help](#)**PRODUCTS**[Teams](#)[Advertising](#)[Collectives](#)[Talent](#)**COMPANY**[About](#)[Press](#)[Work Here](#)[Legal](#)[Privacy Policy](#)**STACK EXCHANGE NETWORK**[Blog](#) [Facebook](#) [Twitter](#) [LinkedIn](#) [Instagram](#)

Technology

Culture &amp; recreation

Life &amp; arts

Science

Professional



Vývojári



Miroslav

Domov

Vytvoriť



## Vývojári

Verejná skupina

Informácie

## Diskusia

Oznámenia

Členovia

Podujatia

Videá

Fotky

Súbory

Hľadať v tejto skupine



Ste člen

Upozornenia

Zdieľať

... Viac



Napísat príspěvok

Pridať fotku/video

Živé video

Viac



Napište niečo...

Fotka/video

Divácka páry

Označiť priateľov

...

NOVÁ AKTIVITA



Roland Mondek

10 h

## POZVAŤ ČLENOV

+ Zadajte meno alebo e-mailovú adresu...

ČLENOVIA

5 505 členov



## POPIS

Skupina softvérových vývojárov. Táto skupina by mala byť miestom... Zobrať viac

## TYP SKUPINY

Všeobecné

## VAŠE STRÁNKY



IT Academy



VITA - Virtual It Academy

## KONTAKTY



Evka Rybárska



Jarmila Palenčárová



Stefan Orosi



Ivana Ivka Jasaňová



Hrá Word Blitz



Ivana Pavlíková



Martin Vanko



Lucia Kovačičová

4 h



Lošák Filip



Andrej Nejedlik



Gabika Zubrikova

## SKUPINOVÉ KONVERZÁCIE



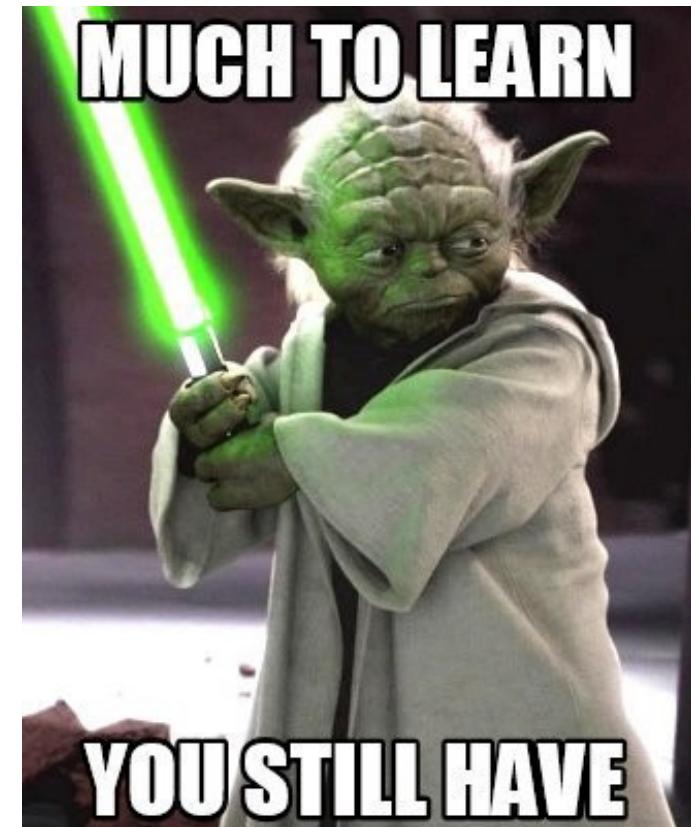
Vytvoriť novú skupinu

Hľadať



# Čo ti odporúčam si pozrieť?

1. <https://livesql.oracle.com/apex/>
2. <https://docs.oracle.com/en/database/oracle/oracle-database/21/lnpls/index.html>
3. <https://www.oracle.com/in/database/technologies/howto-connect-xe.html>
4. [https://docs.oracle.com/middleware/1221/bip/BIPDM/best\\_practices.htm](https://docs.oracle.com/middleware/1221/bip/BIPDM/best_practices.htm)
5. [http://www.dba-oracle.com/t\\_plsql\\_best\\_practices\\_standards](http://www.dba-oracle.com/t_plsql_best_practices_standards)



# Performance Best Practices

1. [Only Return the Data You Need](#)
  2. [Use Column Aliases to Shorten XML File Length](#)
  3. [Avoid Using Group Filters by Enhancing Your Query](#)
  4. [Avoid PL/SQL Calls in WHERE Clauses](#)
  5. [Avoid Use of the System Dual Table](#)
  6. [Avoid PL/SQL Calls at the Element Level](#)
  7. [Avoid Including Multiple Data Sets](#)
  8. [Avoid Nested Data Sets](#)
  9. [Avoid In-Line Queries \(as summary columns\)](#)
  10. [Avoid Excessive Parameter Bind Values](#)
  11. [Tips for Multi-value Parameters](#)
  12. [Group Break and Sorting Data](#)
- [Know Oracle WebLogic Server Default Time Out Setting](#)
  - [Best Practices for SQL Data Sets](#)
  - [Lists of Values](#)
  - [Working with Lexicals/Flexfields](#)
  - [Working with Date Parameters](#)
  - [Run Report Online/Offline \(Schedule\)](#)
  - [Setting Data Model Properties to Prevent Memory Errors](#)
  - [SQL Query Tuning](#)

# Najdôležitejšie klávesové skratky

## Práca s IDE

- Ctrl + D Delete zmaž riadok
- **Ctrl + Space** Asistent kódu
- **Ctrl + /** Komentáre
- Ctrl + A Označ všetko
- **Alt + /** Dokonči slovo
- Ctrl + F Hľadanie a náhrady
- Ctrl + Shift + F Kompakt režim
- Ctrl + Shift + S Ulož všetko

## Práca s browserom

- Ctrl + T Vytvor nový tab
- Ctrl + W Zatvor aktuálny tab
- Ctrl + Shift + W Zatvor všetky taby
- **Ctrl + Shift + T** Otvor posledný tab
- Ctrl + Shift + J/F12 Web console
- **F11** Fullscreen

**F5 nie je spustenie, ale Refresh**

# Čo je Grow with Google?

Grow with Google je **globálna iniciatíva**, ktorej cieľom je vytvoriť viac príležitostí pre všetkých.

Poskytuje **kurzy, nástroje a školenia** či už online alebo offline, ktoré ľuďom pomáhajú získavať tie správne zručnosti, aby si našli prácu, posunuli svoju kariéru či nakopli svoje podnikanie.

V roku 2021 sa zameriava na pomoc:

- **Malým a stredným podnikateľom**
- **Startupom**
- **Neziskovým organizáciám**
- **Ženám**
- **Mnoho ďalším ...**

Viac informácií nájdete na:  
[www.growwithgoogle.sk](http://www.growwithgoogle.sk)



# Slovensko môže patríť k digitálne najrozvinutejším ekonomikám, avšak...

132



**Strácame  
momentum**  
kvôli nedostatku  
inovácií



Až 99 % firiem  
na Slovensku sú  
**malé a stredné podniky**



Máme nízky počet  
**startupov**, najmä v  
regiónoch



**Digitalizácia  
podnikania** je na  
Slovensku jedna z  
**najnižších v rámci EU**

**Ekonomika na Slovensku bola  
ovplyvnená nedávnou krízou a  
technológie môžu pomôcť pri jej  
prekonávaní aj v budúcnosti...**

# ...klúčom k naštartovaniu ekonomiky a digitálnej transformácie je vzdelávanie

Od roku 2016 pomáha Grow with Google firmám, používateľom a inštitúciám na Slovensku prijímať digitálnu transformáciu bezpečným spôsobom.

## 100,000 ľudí

sme spoločne preškolili v zručnostiach potrebných pre budúcnosť

## 450 školení

sme spolu s partnermi poskytli na celom Slovensku



## 5 000 + ľudí

začalo podnikať po absolvovaní nášho vzdelávania

Pomáhame Slovensku rásť

# Grow with Google

Našim záväzkom je prispieť k oživeniu slovenskej ekonomiky a do konca roka 2021

pomôcť ďalším 50,000 slovenským firmám a jednotlivcom

lepšie využívať internet k rastu svojho podnikania, rozvoja kariéry či nájdenia novej práce.

## Online marketing

Google Analytics

Online marketing strategy

Google for Nonprofits

Shopping

YouTube

Google My Business

Google Ads

## Technology & Tools

Workspace (G Suite)

Online Security & Safety

Google for Education

AI/ML

## Business & Soft skills

Entrepreneurship

Leadership

Export

#IamRemarkable\*

Entrepreneurship / Diversity for women

Critical thinking / Media literacy

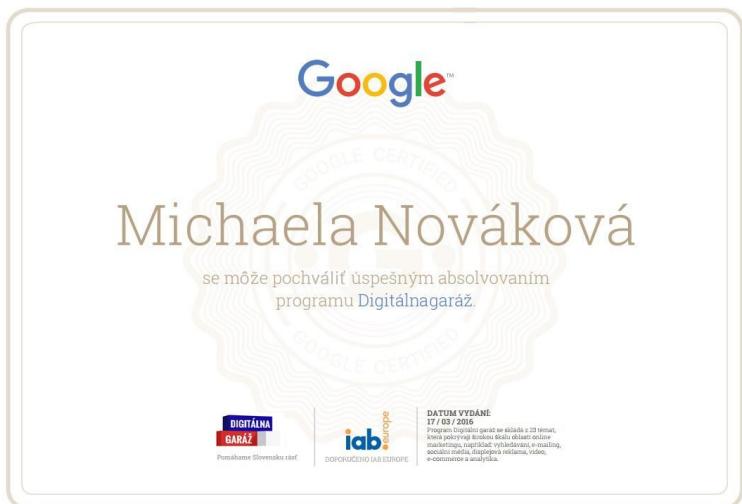
## Online platforma na výuku digitálneho marketingu a mäkkých zručností

26 tém

106 lekcií

9 hodín obsahu

Dostupné 24/7  
Zadarmo  
Na mieru



Google Digitálna garáž

1. Základy e-mailového marketingu

Téma: Využite e-mailové spojenie

Prehľad tému

Lekcie 0 / 4

1. Základy e-mailového marketingu

Sledujte lekcii 6 min

Otestujte si svoje znalosti 1 min

2. Možnosti e-mailového marketingu

3. Vytváranie skvelých marketingových e-mailov

4. Správa úspešných e-mailových kampaní

PRESKOČIŤ NA TEST

ZÁLOŽKA ZDIELAŤ

0:01 / 5:04 YouTube

ZOBRAZIŤ PREPIS

OTESTUJTE SI SVOJE ZNALOSTI

Hlavné poznatky

Zasielanie bulletinov a akčných ponúk zákazníkom prostredníctvom e-mailu môže zohrať kľúčovú úlohu vo vašom marketingovom pláne. Budujte a upevňujte vzťahy so zákazníkmi. V tomto videu sa pozrieme na:

- vytváranie zoznamu kontaktov,
- zacielenie na publikum na základe záujmov,
- budovanie vzťahov so zákazníkmi.

# Odporúčaná literatúra:

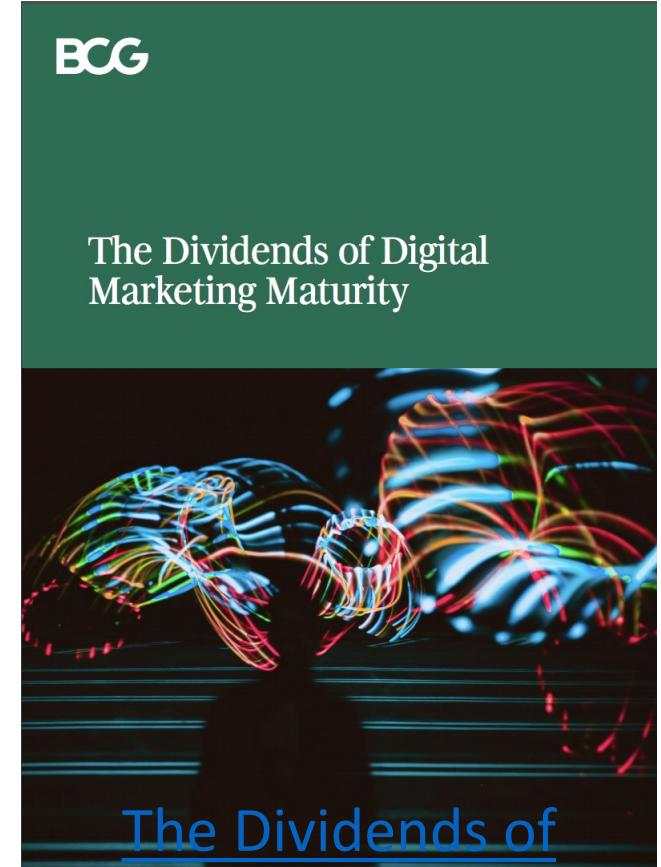
137



[The rise of Digital Challengers, 2018](#)



[Digital Challengers in the next normal, 2020](#)



[The Dividends of  
Digital Marketing  
Maturity, 2019](#)

# Ako sa s nami spojiť?



**ADRESA:** IT Academy, s. r. o.

Budova KOLOSEO prízemie  
Tomášikova 50/A  
831 04 Bratislava



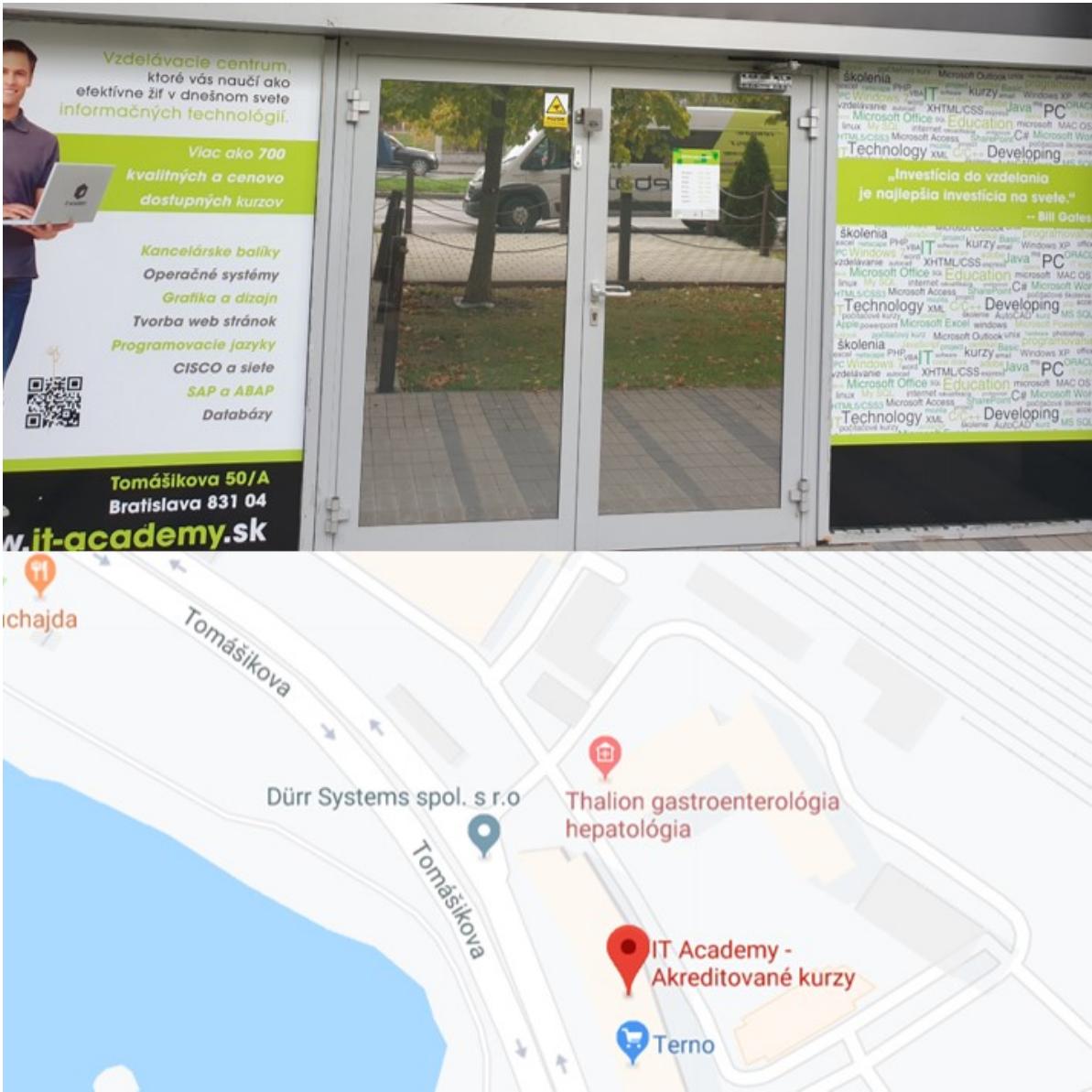
**WEB:** [www.it-academy.sk](http://www.it-academy.sk)



**E-MAIL:** [info@it-academy.sk](mailto:info@it-academy.sk)



**TELEFÓN:** +421 917 095 406



# Ako vieme pomôcť?

#Copywriting

#Školenia

#Zamestnanci

#Pomáhame

#Rast

#Projekty

#Certifikácie

#Kurzy

#Tréningy

#Vzdelávanie

#PPC Kampane

#Elearning

#Mentoring

#Konzultácie

#Online

#Programovanie

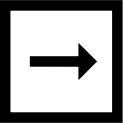
#Vývoj

#Marketing

#Reklama

#Prenájom Techniky

Mrkni na náš YouTube kanál a daj odber

 [WWW.YOUTUBE.COM/C/IT-ACADEMYSK](https://www.youtube.com/c/IT-ACADEMYSK) 