

```
...</g>
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```

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overflow: hidden;
width: 100%;
height: 100%;
text-align: left;
line-height: normal;
z-index: 0;
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transparent;
font-family: "Lucida Grande", "Lucida
Sans Unicode", Arial, Helvetica, sans-serif;
font-size: 12px;
user-select: none;
}
Inherited from body.A1000
body.A1000 (
--control-border-color: #000000;
--control-background-color: #FFFFFF;
--control-caret-color: #000000;
--control-dragover-background-color:
#D3D3D3;
--theme-light-color: #FFFFFF;
--text-color: #000000;
--info-icon-color: #000000;
--text-color-alt: #000000;
--text-color-error: #FF0000;
--border-color: #000000;
--bg-color: #FFFFFF;
--color-primary-alt: #000000;
--color-primary-alt: #000000;
```

# Cognitive Data Science

PROF. DR. FERNANDO T. FERNANDES



# Vimos

---

- Modelo Conceitual
- Diagrama de Entidade e Relacionamento

# Agenda

---

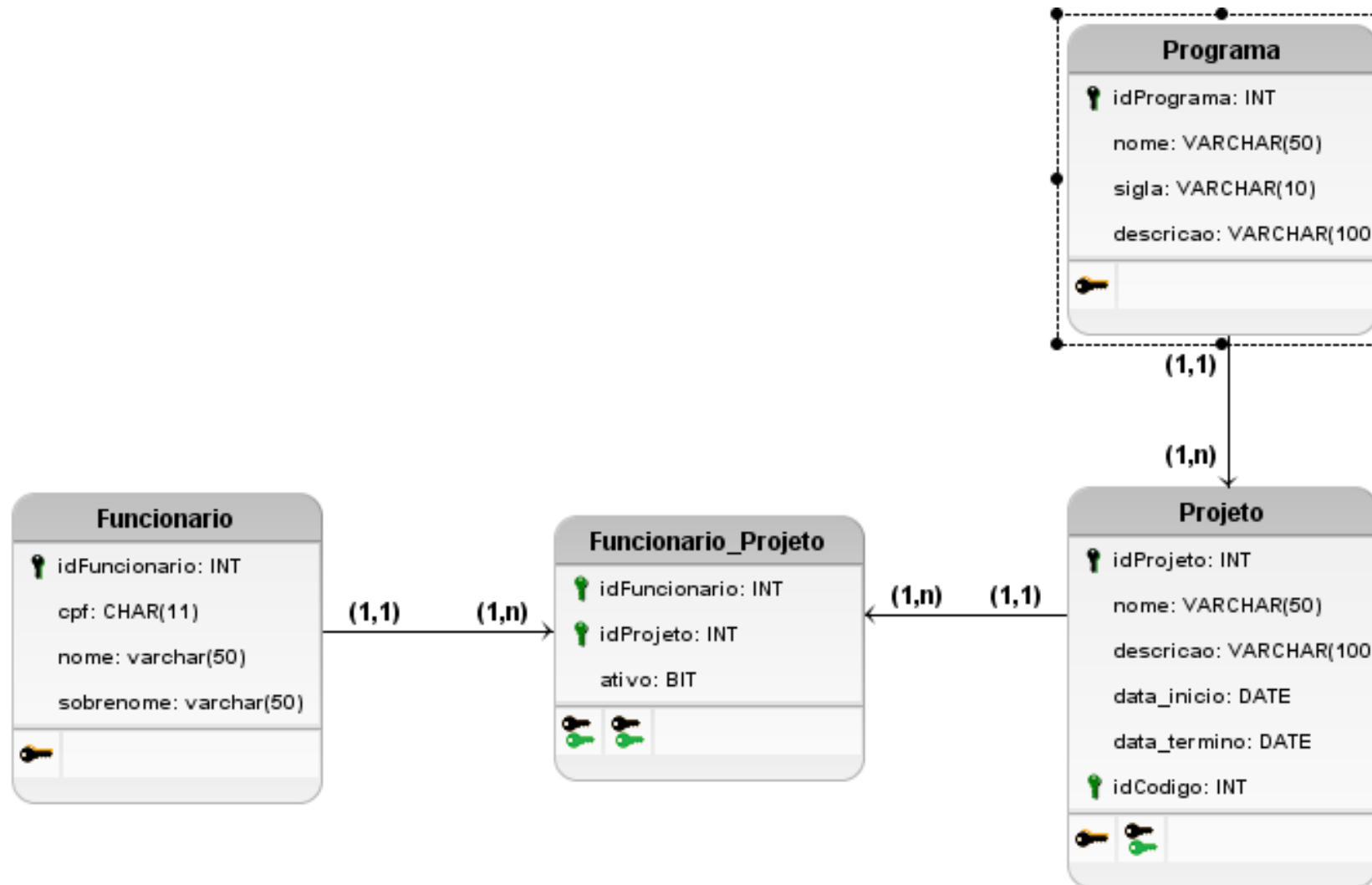
- Modelo Lógico
- Modelo Físico
- Chaves Primária e Estrangeira
- Restrições
- DDL

# Modelo Lógico

---

- Representa a estrutura que irá armazenar os dados dentro de um banco. Define:
  - Tipos de Dados
  - Quantidade de campos
  - Chaves de Relacionamentos
  - Restrições
- Iniciado após a definição do modelo conceitual

# Modelo Lógico



# Restrições (*Constraints*)

---

- Definem regras para inserir dados em uma tabela:
  - **NOT NULL** – Não permite valores nulos em uma coluna
    - ID int NOT NULL
  - **DEFAULT** – Define um valor padrão se nenhum valor for especificado
    - Data Date DEFAULT NOW()
  - **UNIQUE** – Garante que os valores de uma coluna são diferentes
    - Unique (idCliente)
  - **CHECK** – Especifica uma regra para limitar o *range* de valores
    - Ex: CHECK (Idade>=18)
- **AUTO\_INCREMENT** – Incrementa automaticamente uma coluna
  - Ex: idCliente INT NOT NULL AUTO\_INCREMENT

# Restrições (*Constraints*)

---

## ○ Chave Primária - PRIMARY KEY

- Permite identificar de forma **única** cada registro na tabela
- Apenas uma **PK** por tabela, que consiste de **um ou mais atributos**
  - Chave Simples - **PRIMARY KEY** (idCliente)
  - Chave Composta - **PRIMARY KEY** (idCliente,idFornecedor)

## ○ Chave Estrangeira – FOREIGN KEY

- Referencia um atributo em outra tabela
- Previne a inclusão de valores inexistentes de outra tabela

```
CREATE TABLE Pedido (  
    idPedido int NOT NULL,  
    nrPedido int NOT NULL,  
    idCliente int NOT NULL,  
    valorPedido DECIMAL(10,2) NOT NULL,  
    PRIMARY KEY (idPedido),  
    FOREIGN KEY (idCliente)  
        REFERENCES Cliente(idCliente)  
);
```

# Chave primária (Primary Key – PK)

---

- Permite identificar de forma única um registro (também chamado de tupla) em uma tabela
- A combinação de todos os campos do registro é única

**Entidade: Aluno**

Nome	Sobrenome	CPF
Fernando	Fernandes	12345678910
Maria	Silva	45678912310

Chave primária

Tupla, registro


O que aconteceria se tentássemos inserir um novo registro com um CPF já existente à tabela ?



# Chave primária (Primary Key – PK)

---

**Entidade: Aluno**

Nome	Sobrenome	CPF 
Fernando	Fernandes	12345678910
Maria	Silva	45678912310

Chave primária

Tupla, registro

José	Silva	12345678910
------	-------	-------------



Violação de unicidade da chave primária

O SGBD não permitirá inserir o registro

# Chave estrangeira (Foreign Key – FK)

---

- Permite referenciar registros em outras tabelas
- Representa o **Relacionamento** entre as tabelas

## Entidade: Programa

Nome	CodPrograma
Programa A	1
Programa B	2

Chave primária



## Entidade: Projeto

Nome	Codinome	CodProjeto
Projeto A	IA	1
Projeto B	EN	2

Chave primária



Como fazemos para vincular um projeto a um programa?

# Chave estrangeira (Foreign Key – FK)

- Permite referenciar registros em outras tabelas
- Representa o **Relacionamento** entre as tabelas

Como fazemos para vincular um projeto a um programa?

Incluindo uma chave estrangeira!

## Entidade: Programa

Nome	CodPrograma
Programa A	123
Programa B	456

Chave primária



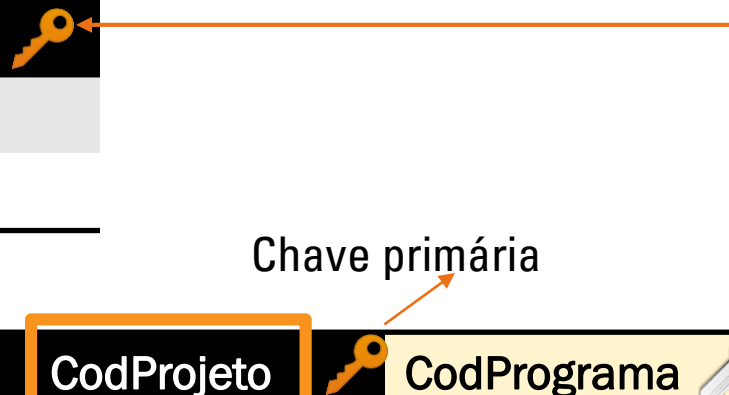
## Entidade: Projeto

Nome	Codinome	CodProjeto	CodPrograma
Projeto A	IA	1	123
Projeto B	EN	2	123
Projeto C	IA	3	456

Chave primária

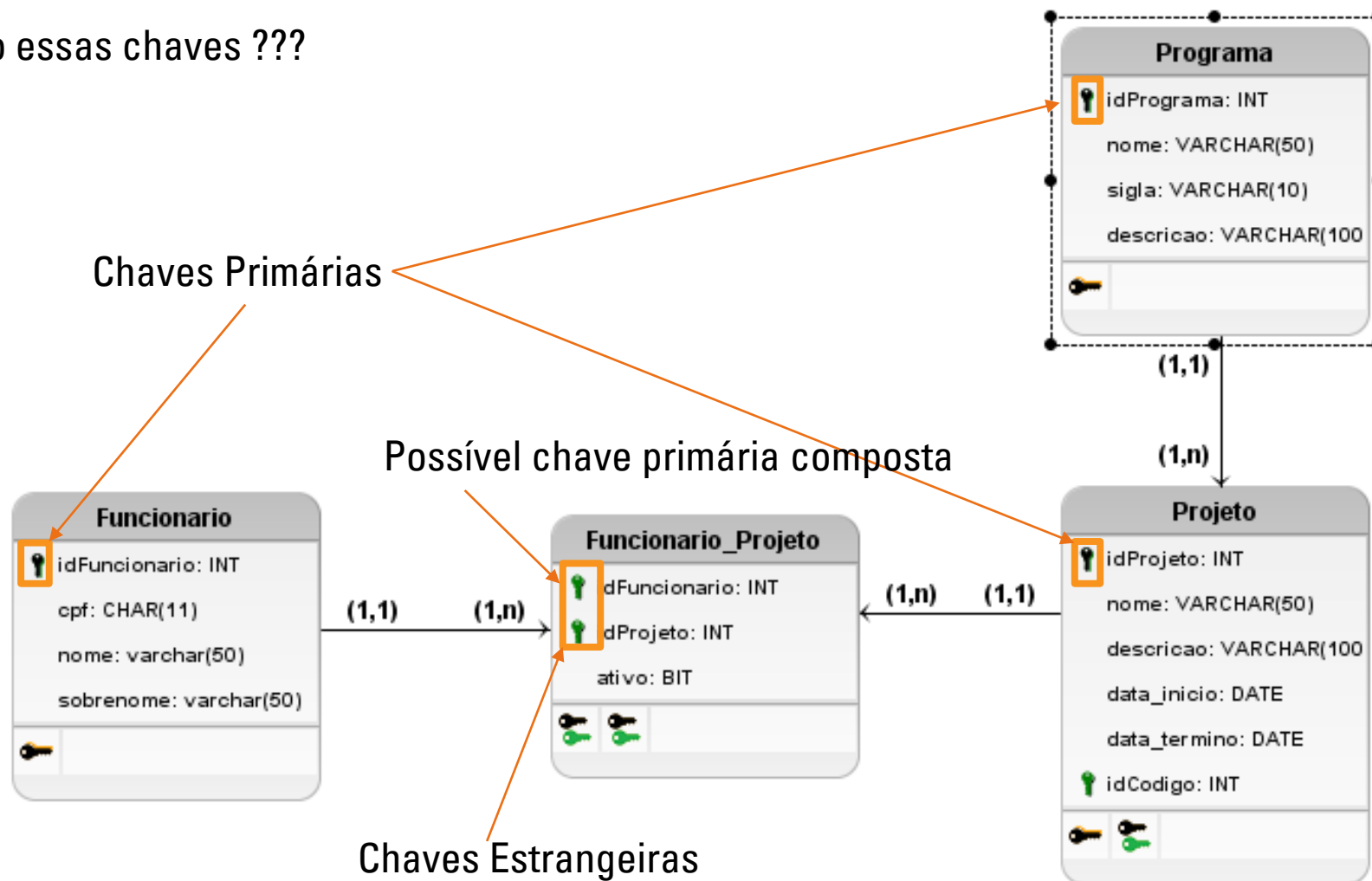


Chave estrangeira



# Modelo Lógico

Quais são essas chaves ???



# Relacionamento muitos-para-muitos (m x n)

---

- Ex: Como consultar todos os funcionários de um projeto e todos os projetos que um funcionário participa ?



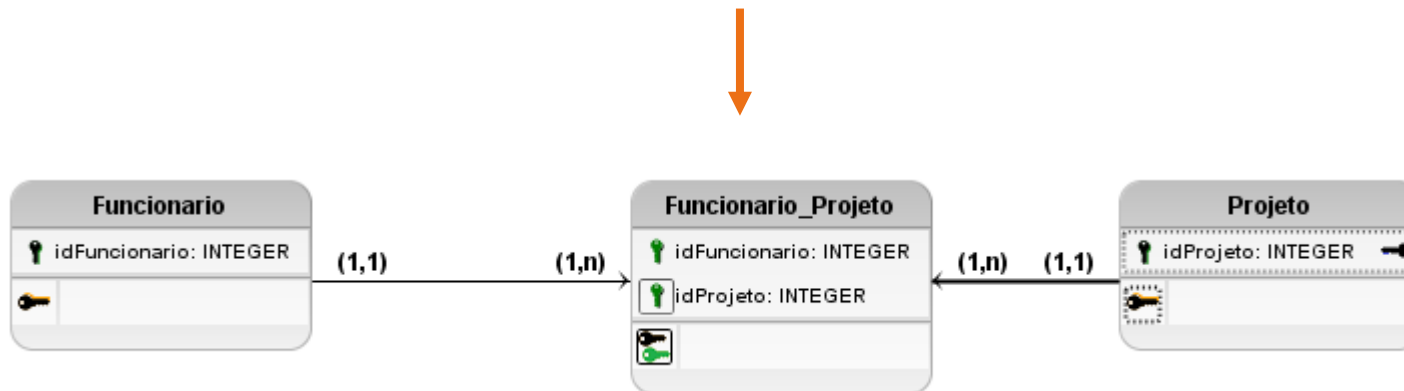
# Entidade Associativa

---

- Entidade Associativa ou Tabela Associativa faz uma relação de duas ou mais chaves primárias em uma relação muitos-para-muitos (m x n).



Modelo Conceitual

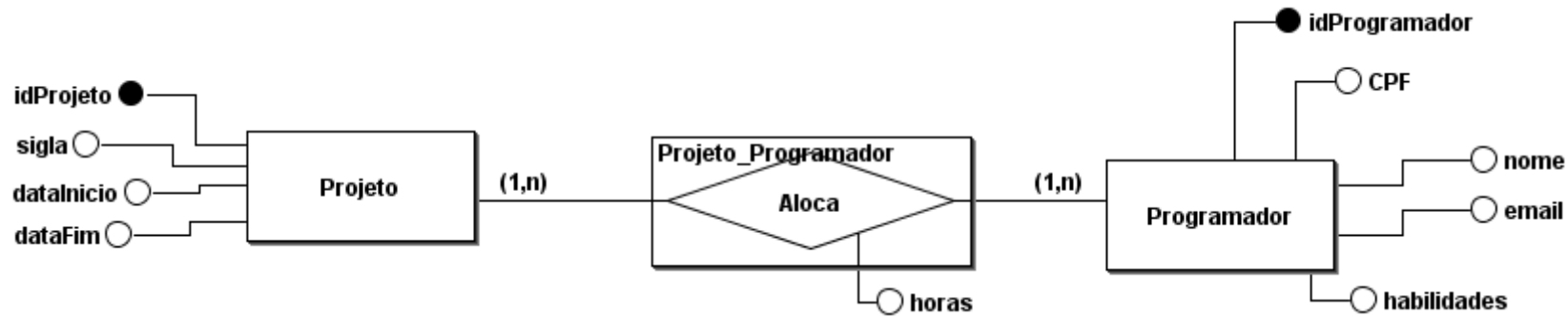


Modelo Lógico

# SGBD – Modelo Lógico


- ❑ Crie um modelo conceitual e lógico (com chaves de relacionamento) no Brmodelo para as seguintes necessidades:
- ❑ A empresa Alpha desenvolve softwares para seus clientes. Para cada software, é criado um projeto com código, sigla, data de início e data de término prevista. Em cada projeto podem ser alocados vários programadores e são contabilizadas suas horas alocadas. Há um cadastro simples do cpf, nome, email e habilidades de cada programador.

# SGBD – Modelo Conceitual – Empresa Alpha





# SGBD – Modelo Conceitual – Empresa Alpha

 brModelo

Arquivo Editar Diagrama Repositório Ajuda

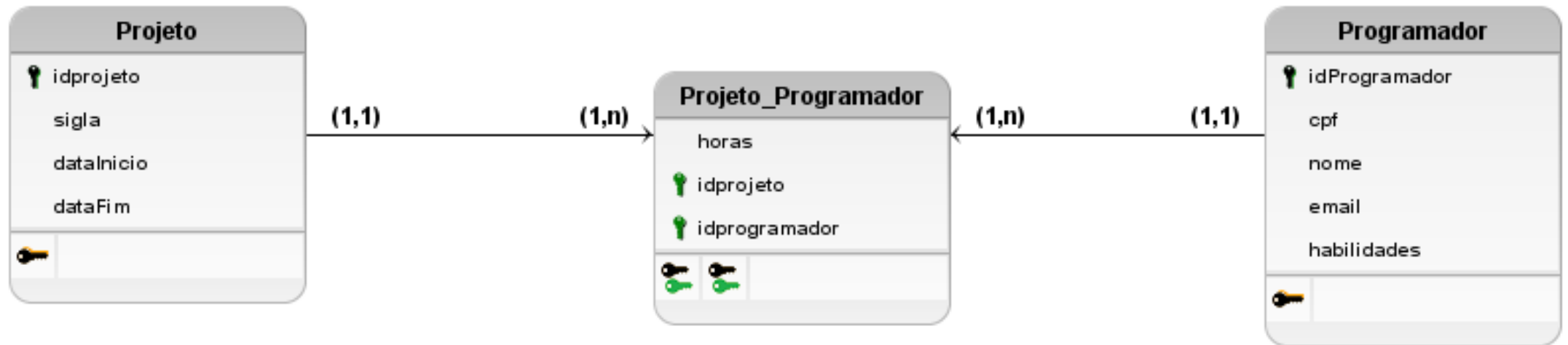


Comandos



Converter para lógico

# SGBD – Modelo Lógico – Empresa Alpha



# SGBD – Modelo Lógico – Empresa Alpha

Editor de campos

Tabelas

Tabela selecionada: 3 - Projeto\_Programador

No... Projeto Programador

+ Adicionar campo | Adicionar em série

Campo: fk_Projeto_idProjeto	Tipo: ▾	<input checked="" type="checkbox"/> Chave primária	<input checked="" type="checkbox"/> Chave estrangeira	<input type="checkbox"/> Único	✖
Campo: fk_Programador_idProgramador	Tipo: ▾	<input checked="" type="checkbox"/> Chave primária	<input checked="" type="checkbox"/> Chave estrangeira	<input type="checkbox"/> Único	✖
Campo: horas	Tipo: ▾	<input type="checkbox"/> Chave primária	<input type="checkbox"/> Chave estrangeira	<input type="checkbox"/> Único	✖

< >

FECHAR

# SGBD – Modelo Lógico – Empresa Alpha



# SGBD – Crie um modelo lógico

- ❑ A partir do modelo conceitual da base de dados Alpha:
  - ❑ Crie um modelo lógico usando o BRModelo
  - ❑ Especifique as chaves Primária e Secundária (Se houver)



Modelo Físico

# SGBD – Linguagens

- ❑ DDL – *Data Definition Language* – Linguagem de Definição de Dados

- ❑ Comandos para a definição, modificação e remoção de estruturas e relacionamentos de tabelas.

- ❑ DML – *Data Modification Language* – Linguagem de Manipulação de Dados para realizar consultas (*Queries*), alterações (*Update*), inclusões (*Insert*) e exclusões (*Delete*) de registros.

# SGBD – SQL

- ❑ **Structured Query Language - SQL**

- ❑ Originalmente chamada de SEQUEL (Structured English Query Language)

- ❑ Permite executar comandos DDL e DML de forma simplificada.

- ❑ Desenvolvida inicialmente pela IBM (p/ a base de dados System R)

- ❑ Uma das razões pela qual os RDBMs são tão populares.



# SGBD – CREATE DATABASE/SCHEMA

- ❑ Cria uma base de dados que pode agrupar várias estruturas (ex: tabelas, views, etc.)

- ❑ No padrão SQL é possível ainda atribuir um usuário que terá acesso a tal agrupamento.

**CREATE SCHEMA ALPHA AUTHORIZATION 'JSilva';**

# SGBD – CREATE DATABASE/SCHEMA

❑ No geral, utiliza-se o sinônimo CREATE DATABASE

❑ No SQLite

❑ CREATE DATABASE <NOMEDATABASE>

❑ base de dados *auto-contida*

❑ Ex: CREATE DATABASE ALPHA

```
mysql> CREATE DATABASE ALPHA;
Query OK, 1 row affected (0.01 sec)

mysql> USE ALPHA;
Database changed
mysql> _
```

```
Windows PowerShell
Prompt de comando - sqlite3 a

C:\SQLite>sqlite3 alpha.db
SQLite version 3.38.1 2022-03-12 13:37:29
Enter ".help" for usage hints.
sqlite> .databases
main: C:\SQLite\alpha.db r/w
sqlite>
```

# SGBD – CREATE TABLE

- ❑ Permite criar uma tabela, seus atributos (ex: colunas) e restrições (PK, FKs)

- ❑ CREATE TABLE ALPHA.PROJETO

- ❑ ou simplesmente:

- ❑ CREATE TABLE <NOMETABELA>

- ❑ SINTAXE:

```
CREATE TABLE <NomeTabela> (  
    <Atr1> <tipo> <Restricao>,  
    <Atr2> <tipo> <Restricao>  
);
```

# SGBD – CREATE TABLE

❑ Também permite especificar restrições de PK e relacionamentos (FKs)

❑ Exemplo:

```
CREATE TABLE Projeto (  
    idprojeto int NOT NULL AUTO_INCREMENT ,  
    sigla VARCHAR(10) NOT NULL,  
    dataInicio DATE,  
    dataFim DATE,  
    PRIMARY KEY (idprojeto)  
);
```

# SGBD – Tipos de Dados

## ☐ Numéricos

☐ smallint | **integer** | **bigint** | float | double precision | **decimal** | numeric

Type	Storage (Bytes)	Minimum Value Signed	Minimum Value Unsigned	Maximum Value Signed	Maximum Value Unsigned
TINYINT	1	-128	0	127	255
SMALLINT	2	-32768	0	32767	65535
MEDIUMINT	3	-8388608	0	8388607	16777215
INT	4	-2147483648	0	2147483647	4294967295
BIGINT	8	$-2^{63}$	0	$2^{63}-1$	$2^{64}-1$

# SGBD – Tipos de Dados

## ☐ Numéricos

☐ smallint | integer | bigint | float | double precision | decimal | numeric

Data Type	Storage Required
<u>TINYINT</u>	1 byte
<u>SMALLINT</u>	2 bytes
<u>MEDIUMINT</u>	3 bytes
<u>INT</u> , <u>INTEGER</u>	4 bytes
<u>BIGINT</u>	8 bytes
<u>FLOAT (p)</u>	4 bytes if 0 <= p <= 24, 8 bytes if 25 <= p <= 53
<u>FLOAT</u>	4 bytes
<u>DOUBLE [PRECISION]</u> , <u>REAL</u>	8 bytes
<u>DECIMAL (M, D)</u> , <u>NUMERIC (M, D)</u>	approximately 16 bytes
<u>BIT (M)</u>	approximately (M+7)/8 bytes

## ☐ Hora/Data

☐ date | time | timestamp | year

Data Type	“Zero” Value
<u>DATE</u>	' 0000-00-00 '
<u>TIME</u>	' 00:00:00 '
<u>DATETIME</u>	' 0000-00-00 00:00:00 '
<u>TIMESTAMP</u>	' 0000-00-00 00:00:00 '
<u>YEAR</u>	0000

## ☐ Booleanos

☐ BIT (TRUE ou FALSE)

## ☐ Cadeias de Caracteres

☐ char | varchar | nvarchar - Ex: char(30) , varchar(30)

☐ BLOB, TEXT, JSON etc.

Value	CHAR (4)	Storage Required	VARCHAR (4)	Storage Required
' '	' '	4 bytes	' '	1 byte
'ab'	'ab '	4 bytes	'ab'	3 bytes
'abcd'	'abcd'	4 bytes	'abcd'	5 bytes
'abcdefgh'	'abcd'	4 bytes	'abcd'	5 bytes

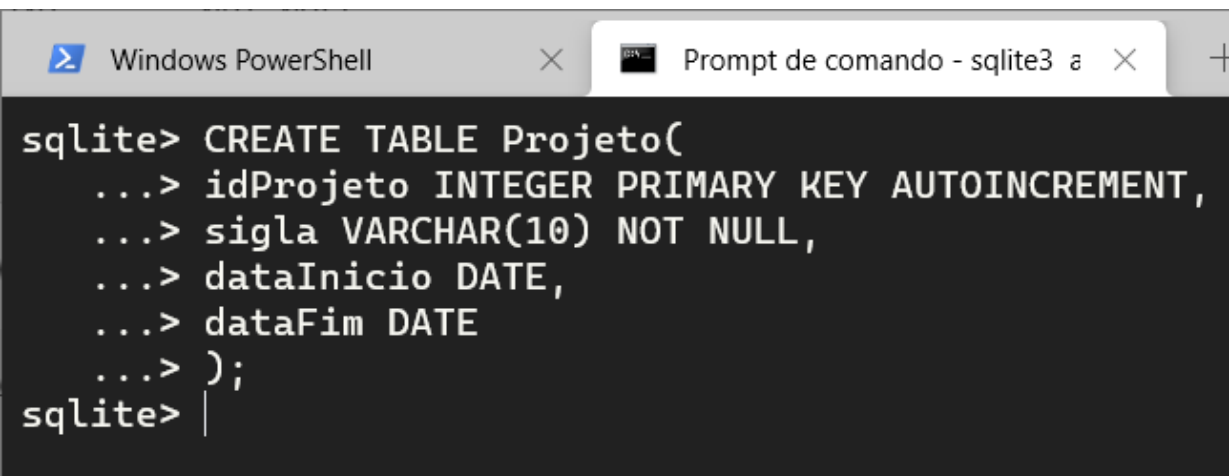
# SGBD – CREATE TABLE

❑ Exemplo:

## MySQL

```
mysql> CREATE TABLE PROJETO (  
-> idprojeto INT NOT NULL AUTO_INCREMENT,  
-> sigla VARCHAR(10) NOT NULL,  
-> dataInicio DATE,  
-> dataFim DATE,  
-> PRIMARY KEY (idprojeto)  
-> );  
Query OK, 0 rows affected (0.05 sec)  
  
mysql> _
```

## SQLite3



```
sqlite> CREATE TABLE Projeto(  
...> idProjeto INTEGER PRIMARY KEY AUTOINCREMENT,  
...> sigla VARCHAR(10) NOT NULL,  
...> dataInicio DATE,  
...> dataFim DATE  
...> );  
sqlite> |
```

# SGBD – CREATE TABLE

❑ Criar mais tabelas:

MySQL

```
mysql> CREATE TABLE PROGRAMADOR (  
-> idProgramador INT NOT NULL AUTO_INCREMENT PRIMARY KEY,  
-> CPF VARCHAR(11) NOT NULL UNIQUE,  
-> nome VARCHAR(50) NOT NULL,  
-> email VARCHAR(50) NOT NULL,  
-> habilidades VARCHAR(200)  
-> );  
Query OK, 0 rows affected (0.03 sec)  
  
mysql>
```

```
mysql> CREATE TABLE PROJETO_PROGRAMADOR (  
-> horas INT,  
-> idProjeto INT NOT NULL,  
-> idProgramador INT NOT NULL,  
-> PRIMARY KEY (idProjeto,idProgramador),  
-> FOREIGN KEY (idProjeto) REFERENCES PROJETO(idProjeto),  
-> FOREIGN KEY (idProgramador) REFERENCES PROGRAMADOR(idProgramador) )  
Query OK, 0 rows affected (0.07 sec)  
  
mysql>
```

SQLite3

```
Prompt de comando - sqlite3 a × + ∨ — □  
  
sqlite> CREATE TABLE PROGRAMADOR(  
...> idProgramador INTEGER PRIMARY KEY AUTOINCREMENT,  
...> CPF VARCHAR(11) NOT NULL UNIQUE,  
...> nome VARCHAR(50) NOT NULL,  
...> email VARCHAR(50) NOT NULL,  
...> habilidades VARCHAR(200)  
...> );  
sqlite> CREATE TABLE PROJETO_PROGRAMADOR(  
...> horas INT,  
...> idProjeto INT NOT NULL,  
...> idProgramador INT NOT NULL,  
...> PRIMARY KEY (idProjeto,idProgramador),  
...> FOREIGN KEY(idProjeto) REFERENCES PROJETO(idProjeto),  
...> FOREIGN KEY(idProgramador) REFERENCES PROGRAMADOR(idProgramador));  
sqlite> |
```



# SGBD – Exibir estrutura de uma tabela

❑ Mysql: DESCRIBE <NOMETABELA> ou  
DESC <NOMETABELA>;

```
mysql> desc projeto;
```

Field	Type	Null	Key	Default	Extra
idprojeto	int	NO	PRI	NULL	auto_increment
sigla	varchar(10)	NO		NULL	
dataInicio	date	YES		NULL	
dataFim	date	YES		NULL	

```
mysql> describe projeto_programador;
```

Field	Type	Null	Key	Default	Extra
horas	int	YES		NULL	
idProjeto	int	NO	PRI	NULL	
idProgramador	int	NO	PRI	NULL	

❑ SQLite: .schema <NOMETABELA> ou  
pragma table\_info('nometabela');

```
Prompt de comando - sqlite3 a x + v

sqlite> .schema projeto
CREATE TABLE Projeto(
  idProjeto INTEGER PRIMARY KEY AUTOINCREMENT,
  sigla VARCHAR(10) NOT NULL,
  dataInicio DATE,
  dataFim DATE
);
sqlite>
```

```
Prompt de comando - sqlite3 a x + v

sqlite> pragma table_info('projeto');
0|idProjeto|INTEGER|0||1
1|sigla|VARCHAR(10)|1||0
2|dataInicio|DATE|0||0
3|dataFim|DATE|0||0
sqlite> |
```

# SGBD – Exibir todas as tabelas de uma base de dados

❑ MySQL

❑ SINTAXE: SHOW TABLES;

```
mysql> show tables;
+-----+
| Tables_in_alpha |
+-----+
| programador     |
| projeto         |
| projeto_programador |
+-----+
3 rows in set (0.01 sec)

mysql>
```

❑ SQLite

❑ SINTAXE: .tables

```
Prompt de comando - sqlite3 a × + ▾
sqlite> .tables
PROGRAMADOR      PROJETO_PROGRAMADOR  Projeto
sqlite> |
```

# SGBD – ALTER TABLE

❑ Também é possível alterar a estrutura de uma tabela existente

❑ SINTAXE:

```
ALTER TABLE <nometabela> ADD <nomecoluna> <opções>;
```

```
ALTER TABLE <nometabela> DROP COLUMN <nomecoluna>;
```

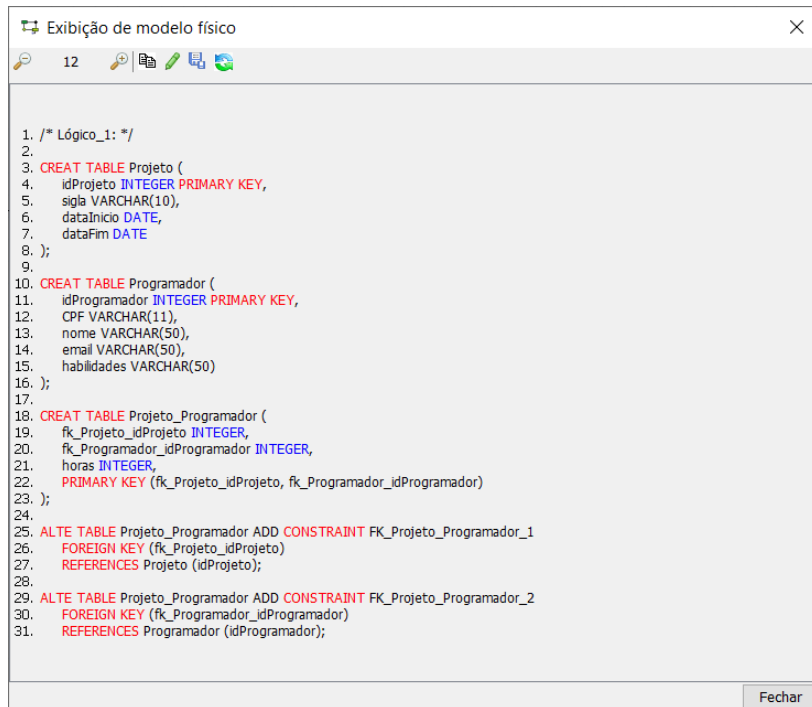
```
ALTER TABLE <nometabela> MODIFY COLUMN <nomecoluna> <opções>;
```

# SGBD – Criar uma base de dados

- ❑ Adicione os tipos de dados ao modelo lógico

- ❑ Crie a base de dados ALPHA

- ❑ Crie as entidades, chaves primária e secundária



```
1. /* Lógico_1: */
2.
3. CREATE TABLE Projeto (
4.   idProjeto INTEGER PRIMARY KEY,
5.   sigla VARCHAR(10),
6.   dataInicio DATE,
7.   dataFim DATE
8. );
9.
10. CREATE TABLE Programador (
11.   idProgramador INTEGER PRIMARY KEY,
12.   CPF VARCHAR(11),
13.   nome VARCHAR(50),
14.   email VARCHAR(50),
15.   habilidades VARCHAR(50)
16. );
17.
18. CREATE TABLE Projeto_Programador (
19.   fk_Projeto_idProjeto INTEGER,
20.   fk_Programador_idProgramador INTEGER,
21.   horas INTEGER,
22.   PRIMARY KEY (fk_Projeto_idProjeto, fk_Programador_idProgramador)
23. );
24.
25. ALTER TABLE Projeto_Programador ADD CONSTRAINT FK_Projeto_Programador_1
26. FOREIGN KEY (fk_Projeto_idProjeto)
27. REFERENCES Projeto (idProjeto);
28.
29. ALTER TABLE Projeto_Programador ADD CONSTRAINT FK_Projeto_Programador_2
30. FOREIGN KEY (fk_Programador_idProgramador)
31. REFERENCES Programador (idProgramador);
```

← Modelo Físico gerado pelo BRModelo



Instalar um SGBD

- ❑ *Self-Contained database*
- ❑ Usado em sistemas embarcados, aplicações desktop com poucos acessos simultâneos, aplicativos móveis, smart tvs, carros, etc
- ❑ Não precisa de instalação ou configuração
- ❑ Não cria um processo separado para sua execução
- ❑ Toda estrutura (tabelas, índices, etc.) de do banco de dados reside em único arquivo



Lançado em 17/08/2000 (Mais de 21 anos)

# SQLite – Tipos de Dados



Data Type	Affinity
INT INTEGER TINYINT SMALLINT MEDIUMINT BIGINT UNSIGNED BIG INT INT2 INT8	INTEGER
CHARACTER(20) VARCHAR(255) VARYING CHARACTER(255) NCHAR(55) NATIVE CHARACTER(70) NVARCHAR(100) TEXT CLOB	TEXT
BLOB no datatype specified	NONE
REAL DOUBLE DOUBLE PRECISION FLOAT	REAL
NUMERIC DECIMAL(10,5) BOOLEAN DATE DATETIME	NUMERIC

# SQLite - Instalação

← → ↻ [sqlite.org/download.html](https://sqlite.org/download.html)

[sqlite-doc-3380200.zip](#) (10.13 MiB) Documentation as a bundle of static HTML files.  
(sha3: c0d1e1fef82753df306fdb2c4df8ece91769ce4c0381d86990bafdd0673f223)

**Precompiled Binaries for Android**

[sqlite-android-3380200.aar](#) (3.20 MiB) A precompiled Android library containing the core SQLite together with the [sqlite3\\_analyzer](#) program.  
(sha3: a93371af537fe56161c1f5efd174b6a0c32506f0273dc5eb787cd39d5eb30956)

**Precompiled Binaries for Linux**

[sqlite-tools-linux-x86-3380200.zip](#) (2.13 MiB) A bundle of command-line tools for managing SQLite database files, including the [sqlite3\\_analyzer](#) program.  
(sha3: d23038e80508dc1e5c90e9636ecaf76f8245afe6168f68f8751e4217434148a5)

**Precompiled Binaries for Mac OS X (x86)**

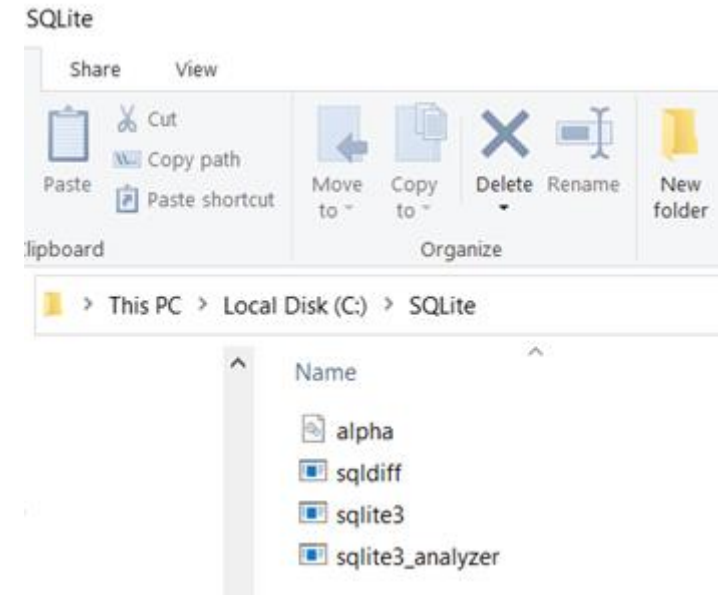
[sqlite-tools-osx-x86-3380200.zip](#) (1.50 MiB) A bundle of command-line tools for managing SQLite database files, including the [sqlite3\\_analyzer](#) program.  
(sha3: a8433c9a0344ab811209bb7bb4da467df2b8d197dadecee8e9d4f53860389ec)

**Precompiled Binaries for Windows**

[sqlite-dll-win32-x86-3380200.zip](#) (553.70 KiB) 32-bit DLL (x86) for SQLite version 3.38.2.  
(sha3: b61e859ff10f052ae078aefef9a8d783884b8c27eac0be099e15f65d74bbf59c)

[sqlite-dll-win64-x64-3380200.zip](#) (994.42 KiB) 64-bit DLL (x64) for SQLite version 3.38.2.  
(sha3: 5f3a43c438cb4cc3ac56358e005c7f190105cdd5d3b02910b6818b1dde23f5c5)

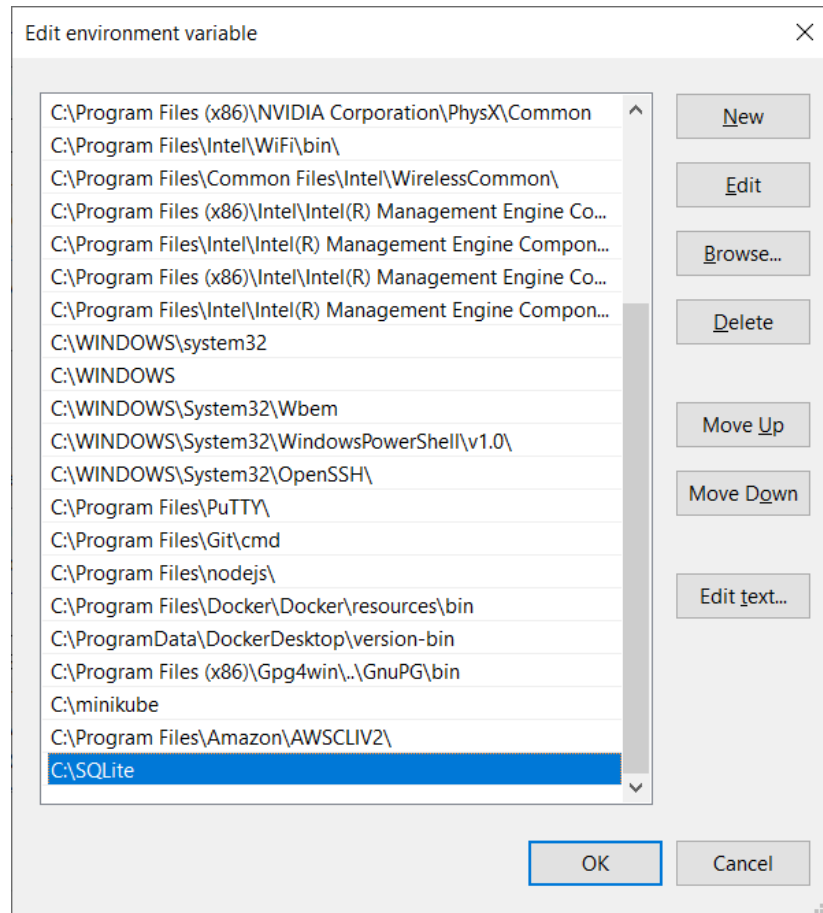
[sqlite-tools-win32-x86-3380200.zip](#) (1.87 MiB) A bundle of command-line tools for managing SQLite database files, including the [sqlite3\\_analyzer.exe](#) program.  
(sha3: 0e22e47873902388e3b26c3702fa3cd53ab3f29e315014d7fe25efb0aefbf6bf)





# SQLite - Instalação

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Adicione uma variável de ambiente de sistema apontando para a pasta do SQLite

# MySQL

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- ❑ Recebeu o nome de uma das filhas (My) de seu criador Michael “Monty” Widenius

- ❑ Versão Comunitária (Community)

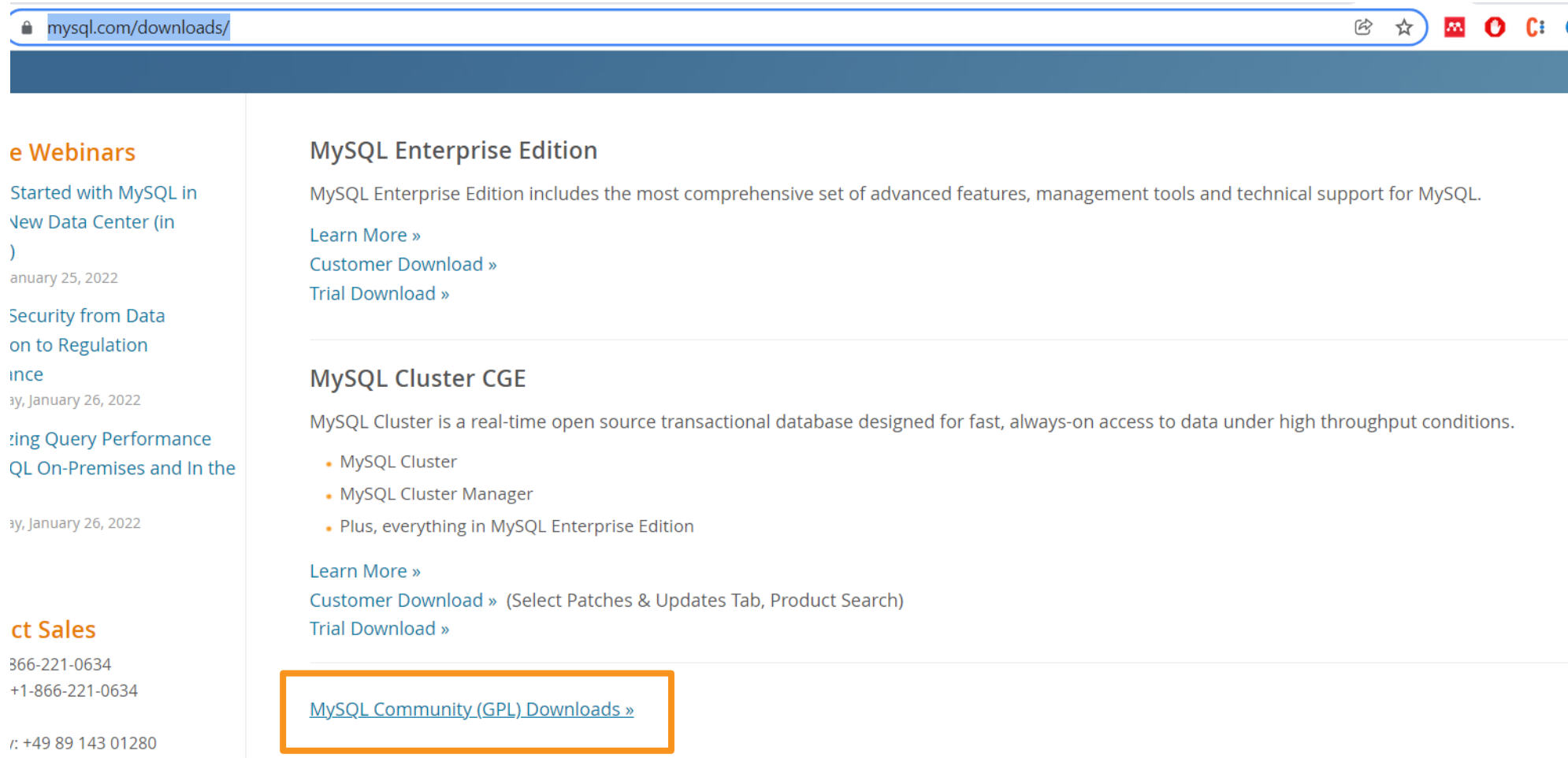
  - ❑ Gratuita



- ❑ É possível instalar somente o SGBD e acessá-lo por linha de comando

- ❑ Também é possível instalar juntamente com o ambiente gráfico (MySQL Workbench)

# Instalação de um SGBD - MySQL

A screenshot of the MySQL Downloads page. The browser address bar shows 'mysql.com/downloads/'. The page has a dark blue header. On the left, there are sections for 'Webinars' and 'Contact Sales'. The main content area features 'MySQL Enterprise Edition', 'MySQL Cluster CGE', and a highlighted link for 'MySQL Community (GPL) Downloads'.

mysql.com/downloads/

## e Webinars

Started with MySQL in New Data Center (in )  
January 25, 2022

Security from Data on to Regulation  
ince  
January 26, 2022

izing Query Performance  
QL On-Premises and In the  
January 26, 2022

## ct Sales

366-221-0634  
+1-866-221-0634  
r: +49 89 143 01280

## MySQL Enterprise Edition

MySQL Enterprise Edition includes the most comprehensive set of advanced features, management tools and technical support for MySQL.

[Learn More »](#)  
[Customer Download »](#)  
[Trial Download »](#)

## MySQL Cluster CGE

MySQL Cluster is a real-time open source transactional database designed for fast, always-on access to data under high throughput conditions.

- MySQL Cluster
- MySQL Cluster Manager
- Plus, everything in MySQL Enterprise Edition

[Learn More »](#)  
[Customer Download »](#) (Select Patches & Updates Tab, Product Search)  
[Trial Download »](#)

[MySQL Community \(GPL\) Downloads »](#)

# Instalação de um SGBD - MySQL

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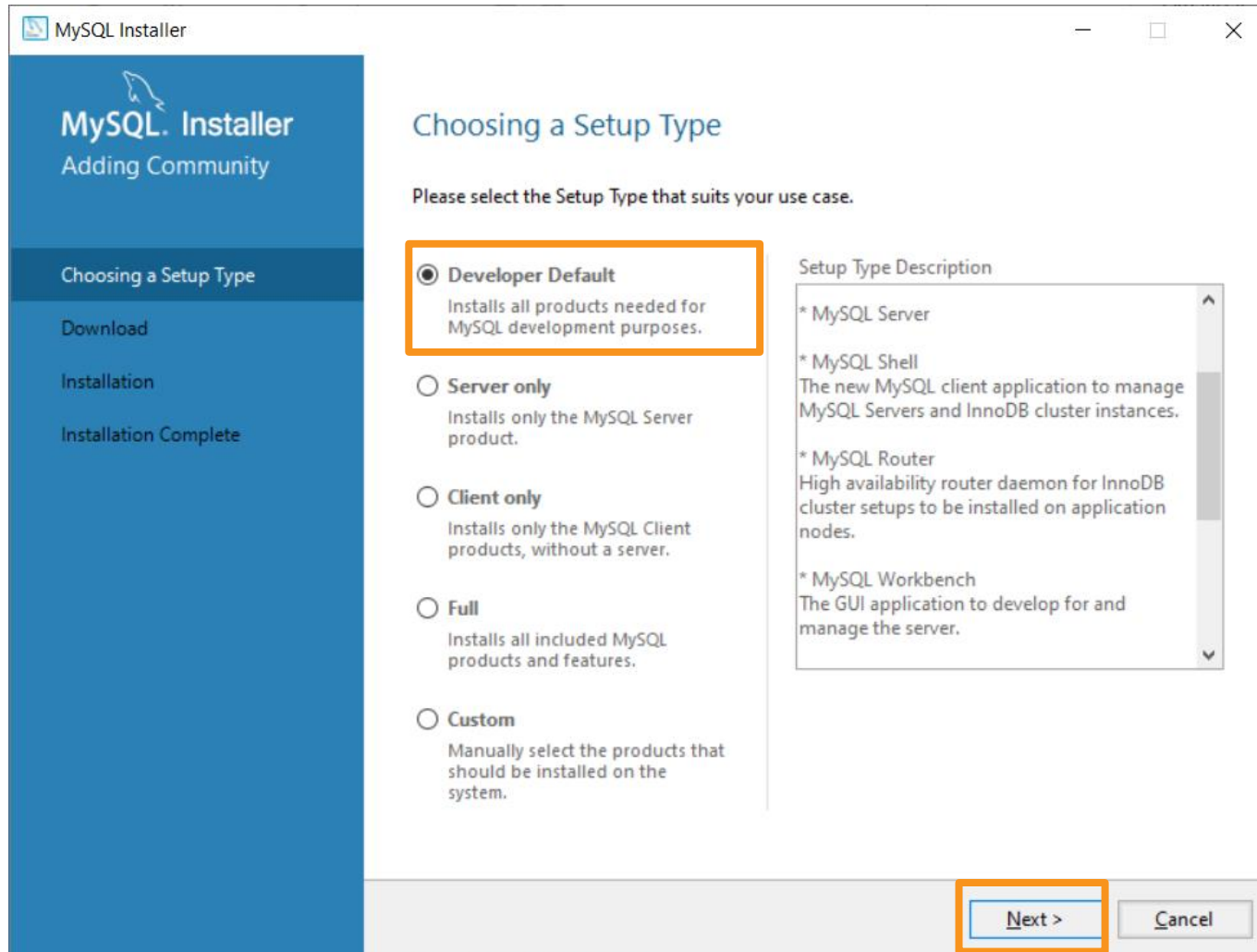
## 📌 MySQL Community Downloads

- MySQL Yum Repository
- MySQL APT Repository
- MySQL SUSE Repository
- MySQL Community Server
- MySQL Cluster
- MySQL Router
- MySQL Shell
- MySQL Workbench
- MySQL Installer for Windows
- MySQL for Visual Studio
- C API (libmysqlclient)
- Connector/C++
- Connector/J
- Connector/NET
- Connector/Node.js
- Connector/ODBC
- Connector/Python
- MySQL Native Driver for PHP
- MySQL Benchmark Tool
- Time zone description tables
- Download Archives

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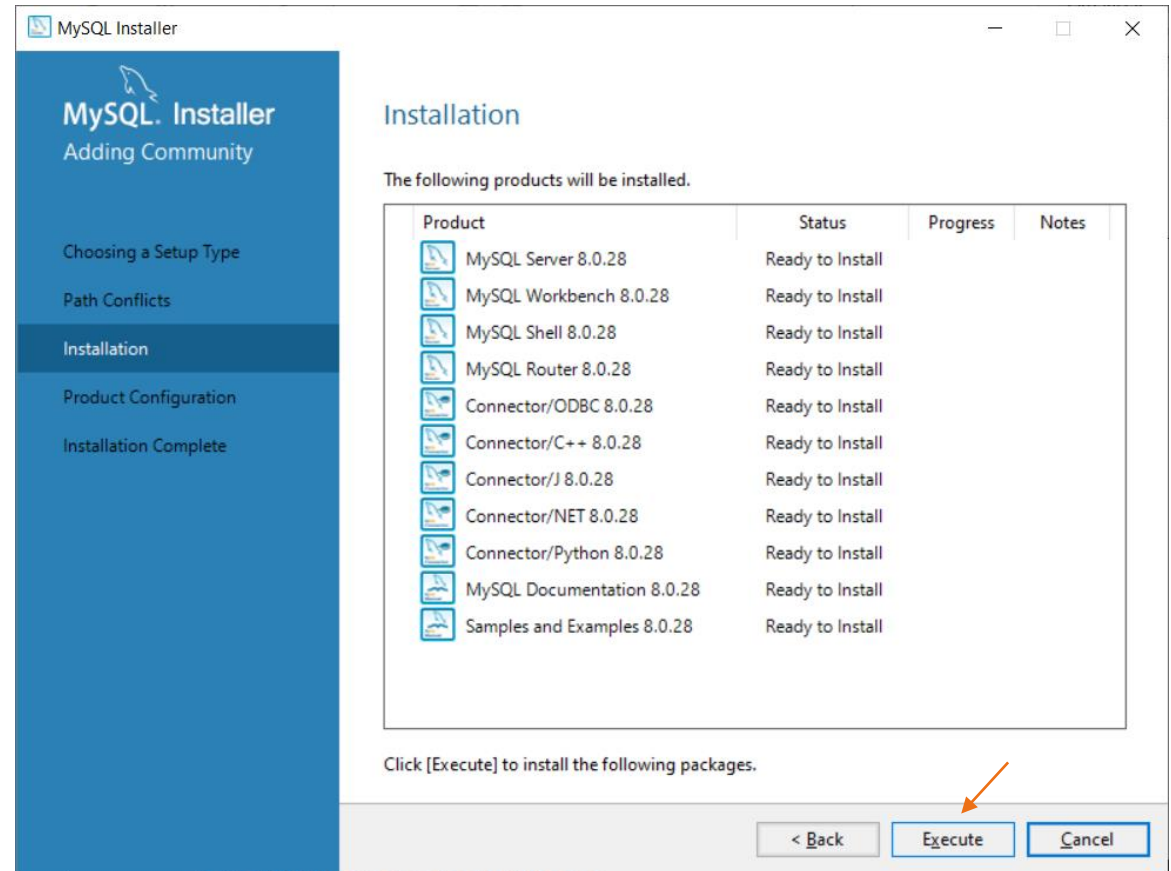
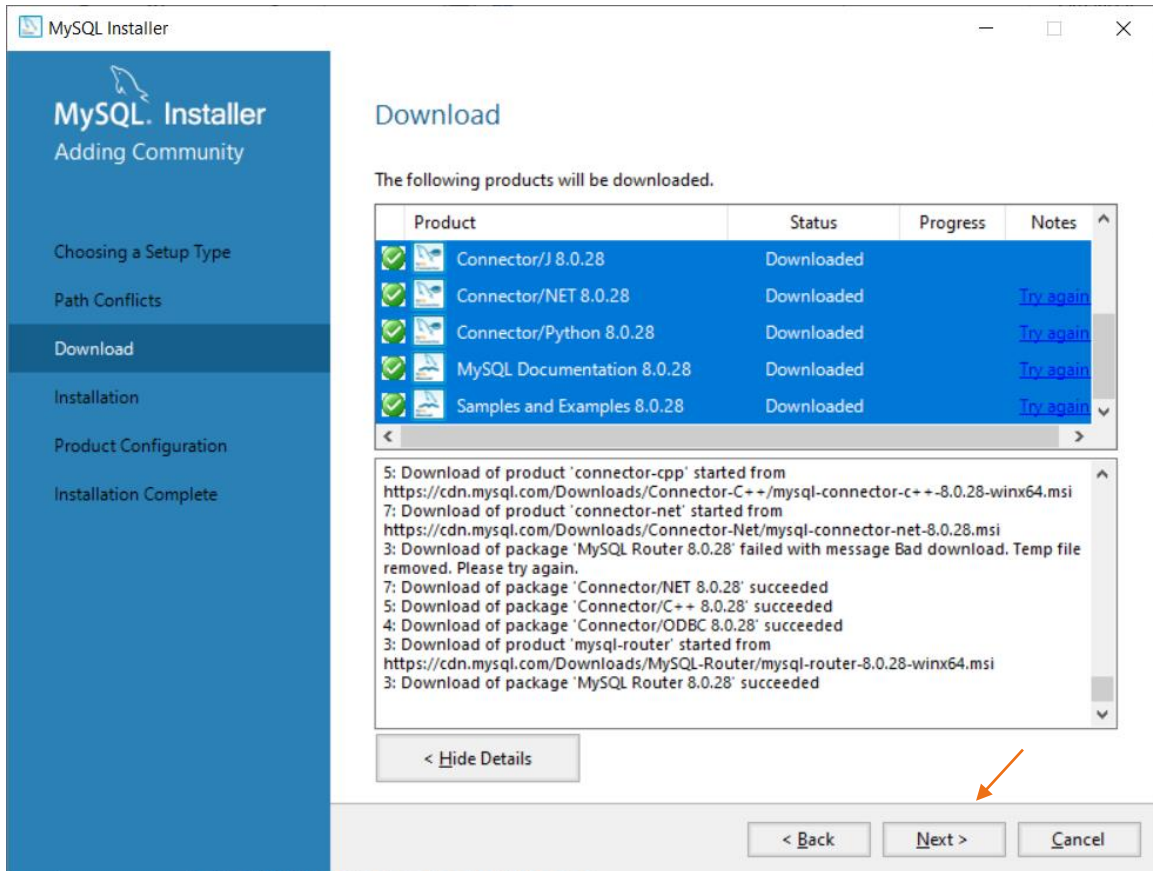
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# Instalação de um SGBD - MySQL

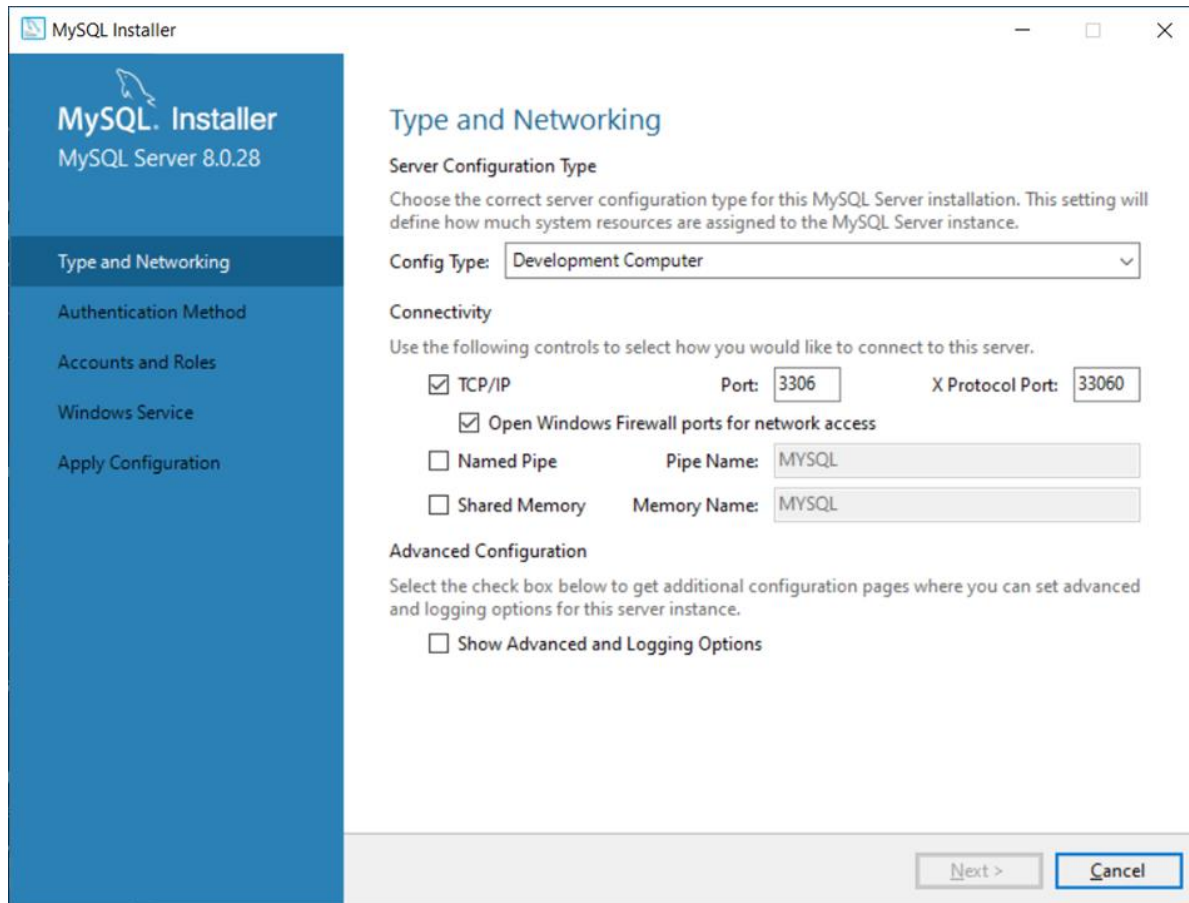


# Instalação de um SGBD - MySQL

Obs: Em casos de falha no download, clique em "Try Again"



# Instalação de um SGBD - MySQL



The screenshot shows the 'Type and Networking' screen of the MySQL Installer. The left sidebar has 'Type and Networking' selected. The main area is titled 'Type and Networking' and contains sections for 'Server Configuration Type', 'Connectivity', and 'Advanced Configuration'. The 'Config Type' is set to 'Development Computer'. Under 'Connectivity', 'TCP/IP' is checked with port '3306', and 'Open Windows Firewall ports for network access' is also checked. 'Named Pipe' and 'Shared Memory' are unchecked. Under 'Advanced Configuration', 'Show Advanced and Logging Options' is unchecked. At the bottom right are 'Next >' and 'Cancel' buttons.

MySQL Installer  
MySQL Server 8.0.28

Type and Networking

Server Configuration Type

Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance.

Config Type: Development Computer

Connectivity

Use the following controls to select how you would like to connect to this server.

☒ TCP/IP Port: 3306 X Protocol Port: 33060

☒ Open Windows Firewall ports for network access

☐ Named Pipe Pipe Name: MYSQL

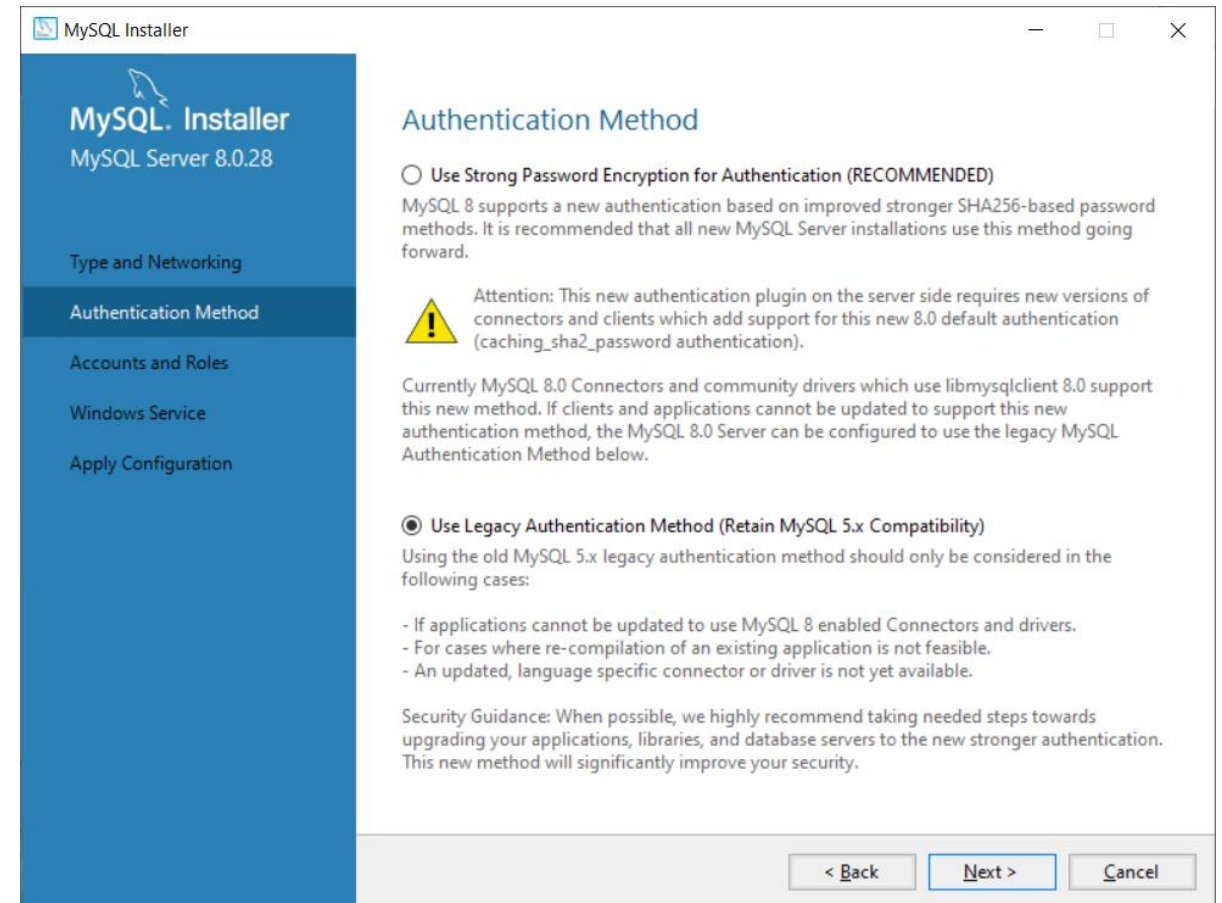
☐ Shared Memory Memory Name: MYSQL

Advanced Configuration

Select the check box below to get additional configuration pages where you can set advanced and logging options for this server instance.

☐ Show Advanced and Logging Options

Next > Cancel




The screenshot shows the 'Authentication Method' screen of the MySQL Installer. The left sidebar has 'Authentication Method' selected. The main area is titled 'Authentication Method' and contains two radio button options: 'Use Strong Password Encryption for Authentication (RECOMMENDED)' and 'Use Legacy Authentication Method (Retain MySQL 5.x Compatibility)'. The first option is selected. A warning icon and text explain that MySQL 8 supports a new authentication method based on improved stronger SHA256-based password methods. A second warning icon and text state that this new authentication plugin requires new versions of connectors and clients. Below this, it says 'Currently MySQL 8.0 Connectors and community drivers which use libmysqlclient 8.0 support this new method. If clients and applications cannot be updated to support this new authentication method, the MySQL 8.0 Server can be configured to use the legacy MySQL Authentication Method below.' Under the 'Use Legacy Authentication Method' option, it lists three cases: applications cannot be updated, re-compilation is not feasible, or an updated connector/driver is not available. A 'Security Guidance' section recommends upgrading applications, libraries, and database servers to the new stronger authentication method. At the bottom right are '< Back', 'Next >', and 'Cancel' buttons.

MySQL Installer  
MySQL Server 8.0.28

Authentication Method

☐ Use Strong Password Encryption for Authentication (RECOMMENDED)

MySQL 8 supports a new authentication based on improved stronger SHA256-based password methods. It is recommended that all new MySQL Server installations use this method going forward.

 Attention: This new authentication plugin on the server side requires new versions of connectors and clients which add support for this new 8.0 default authentication (caching\_sha2\_password authentication).

Currently MySQL 8.0 Connectors and community drivers which use libmysqlclient 8.0 support this new method. If clients and applications cannot be updated to support this new authentication method, the MySQL 8.0 Server can be configured to use the legacy MySQL Authentication Method below.

☒ Use Legacy Authentication Method (Retain MySQL 5.x Compatibility)

Using the old MySQL 5.x legacy authentication method should only be considered in the following cases:

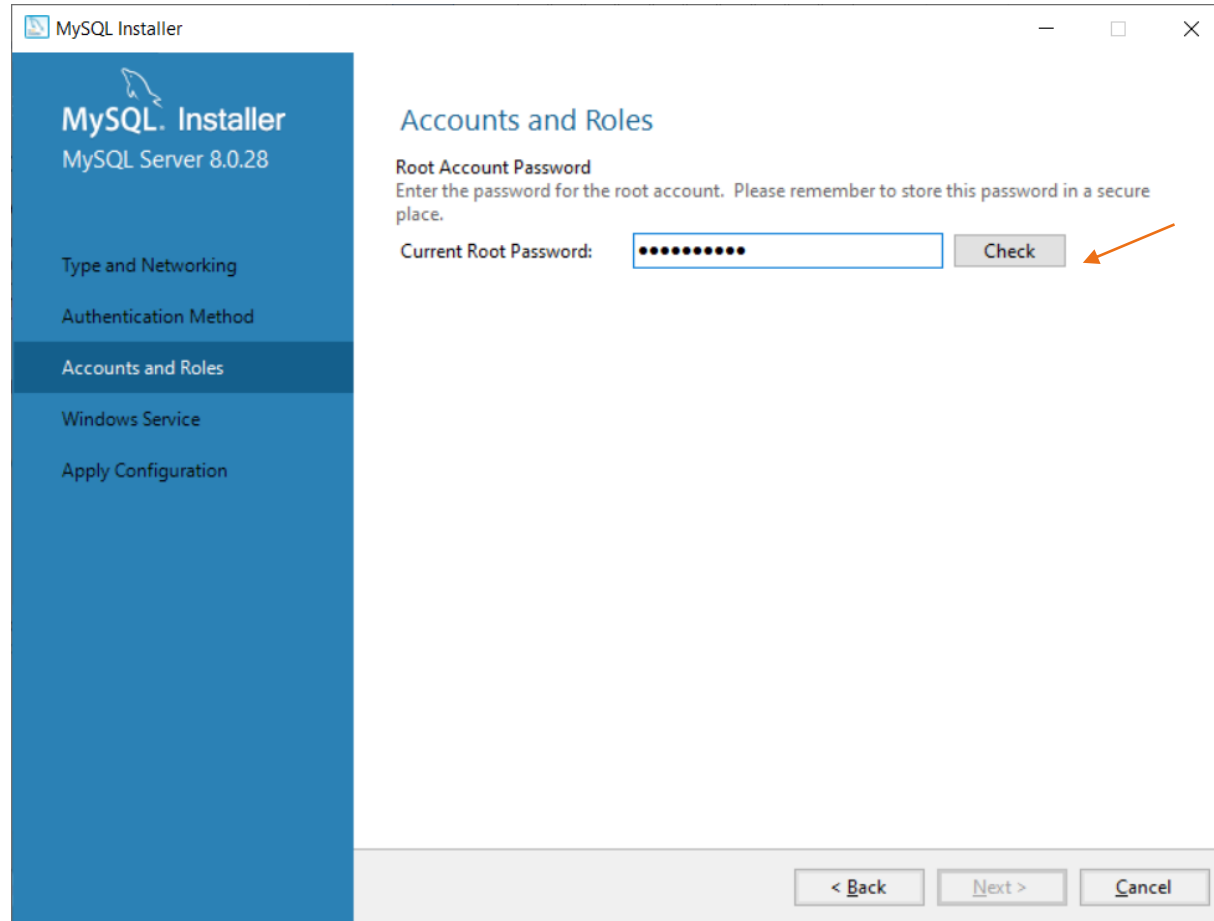
- If applications cannot be updated to use MySQL 8 enabled Connectors and drivers.
- For cases where re-compilation of an existing application is not feasible.
- An updated, language specific connector or driver is not yet available.

Security Guidance: When possible, we highly recommend taking needed steps towards upgrading your applications, libraries, and database servers to the new stronger authentication. This new method will significantly improve your security.

< Back Next > Cancel



# Instalação de um SGBD - MySQL



The screenshot shows the 'Accounts and Roles' step of the MySQL Installer. The left sidebar lists the installation steps: Type and Networking, Authentication Method, Accounts and Roles (highlighted), Windows Service, and Apply Configuration. The main area is titled 'Accounts and Roles' and contains a 'Root Account Password' section. It instructs the user to enter a password for the root account and remember it. Below this, there is a 'Current Root Password' label, a text input field containing ten dots, and a 'Check' button. An orange arrow points to the 'Check' button. At the bottom, there are three buttons: '< Back', 'Next >', and 'Cancel'.

MySQL Installer  
MySQL Server 8.0.28

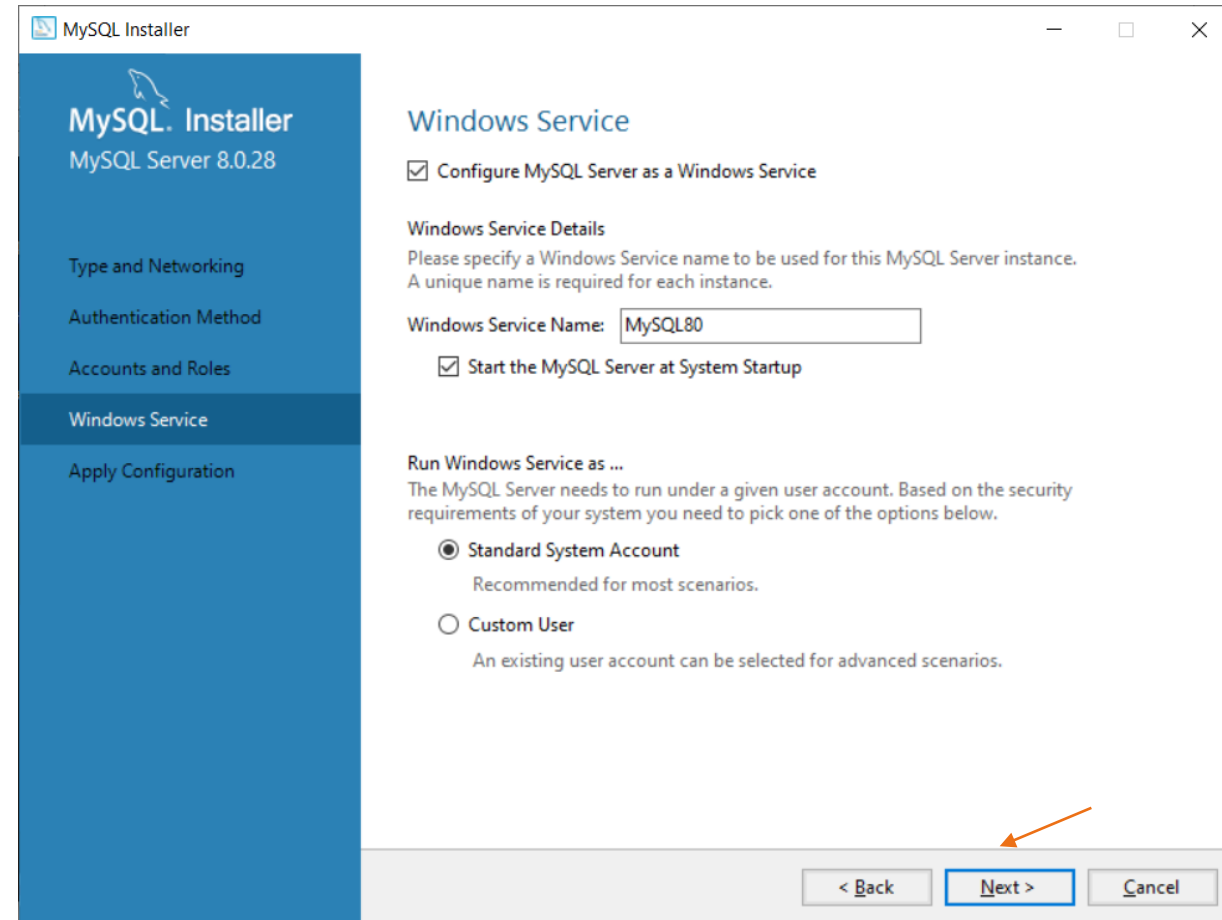
Type and Networking  
Authentication Method  
**Accounts and Roles**  
Windows Service  
Apply Configuration

**Accounts and Roles**

**Root Account Password**  
Enter the password for the root account. Please remember to store this password in a secure place.

Current Root Password:

< Back   Next >   Cancel



The screenshot shows the 'Windows Service' step of the MySQL Installer. The left sidebar lists the installation steps: Type and Networking, Authentication Method, Accounts and Roles, Windows Service (highlighted), and Apply Configuration. The main area is titled 'Windows Service' and contains a checkbox labeled 'Configure MySQL Server as a Windows Service', which is checked. Below this, there is a 'Windows Service Details' section with instructions to specify a Windows Service name. A text input field contains 'MySQL80'. There is also a checkbox labeled 'Start the MySQL Server at System Startup', which is checked. At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with an orange arrow), and 'Cancel'.

MySQL Installer  
MySQL Server 8.0.28

Type and Networking  
Authentication Method  
Accounts and Roles  
**Windows Service**  
Apply Configuration

**Windows Service**

☒ **Configure MySQL Server as a Windows Service**

**Windows Service Details**  
Please specify a Windows Service name to be used for this MySQL Server instance. A unique name is required for each instance.

Windows Service Name:

☒ **Start the MySQL Server at System Startup**

**Run Windows Service as ...**  
The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below.

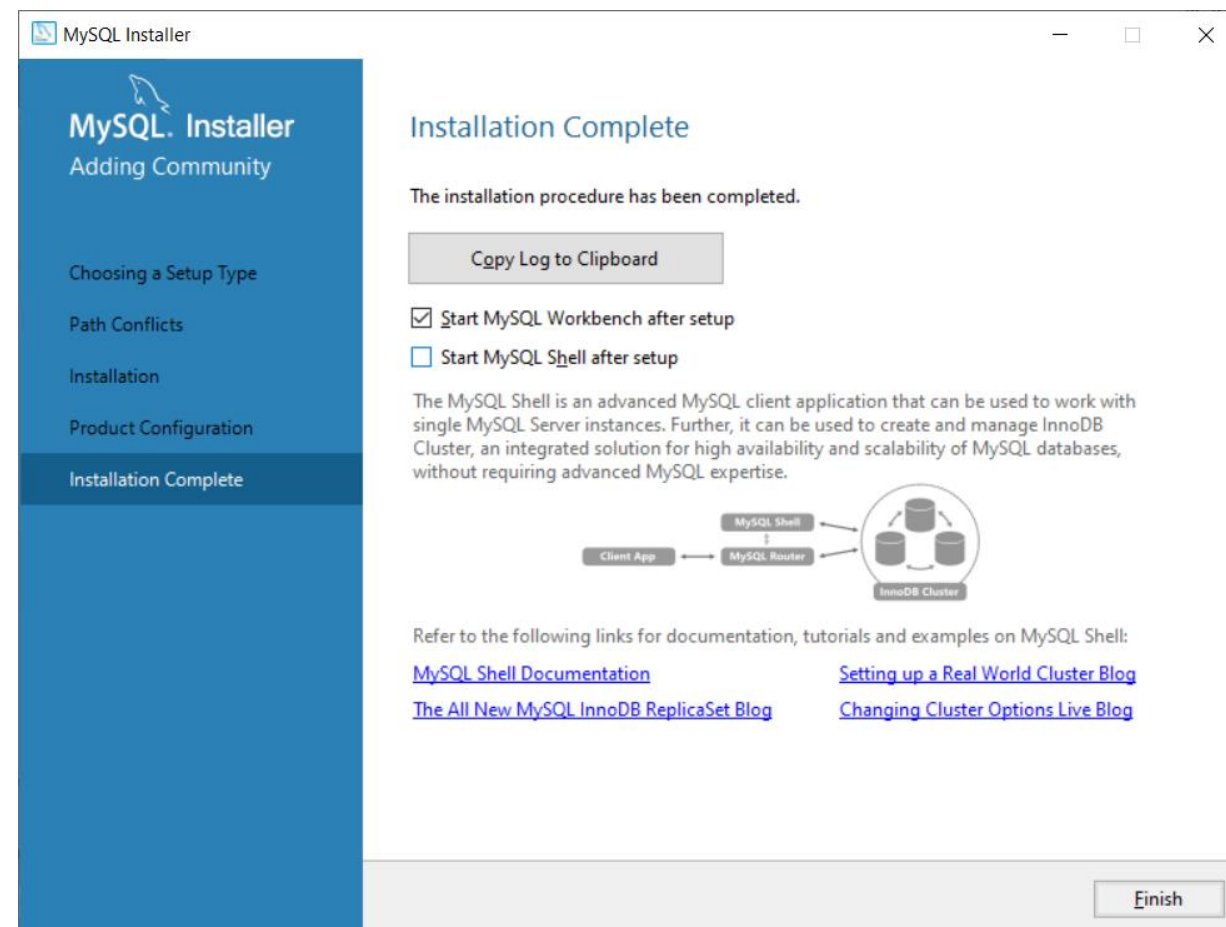
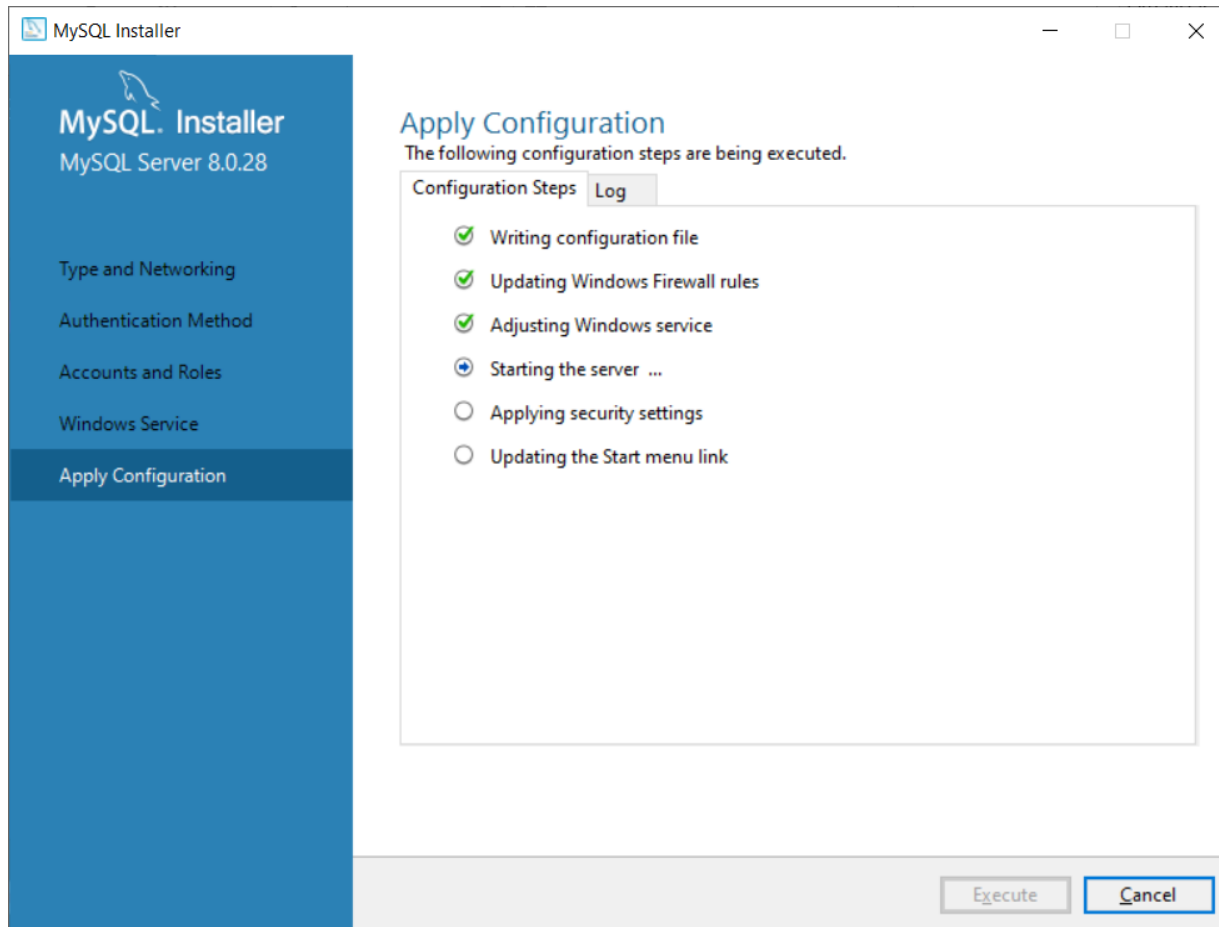
☒ **Standard System Account**  
Recommended for most scenarios.

☐ **Custom User**  
An existing user account can be selected for advanced scenarios.

< Back   **Next >**   Cancel

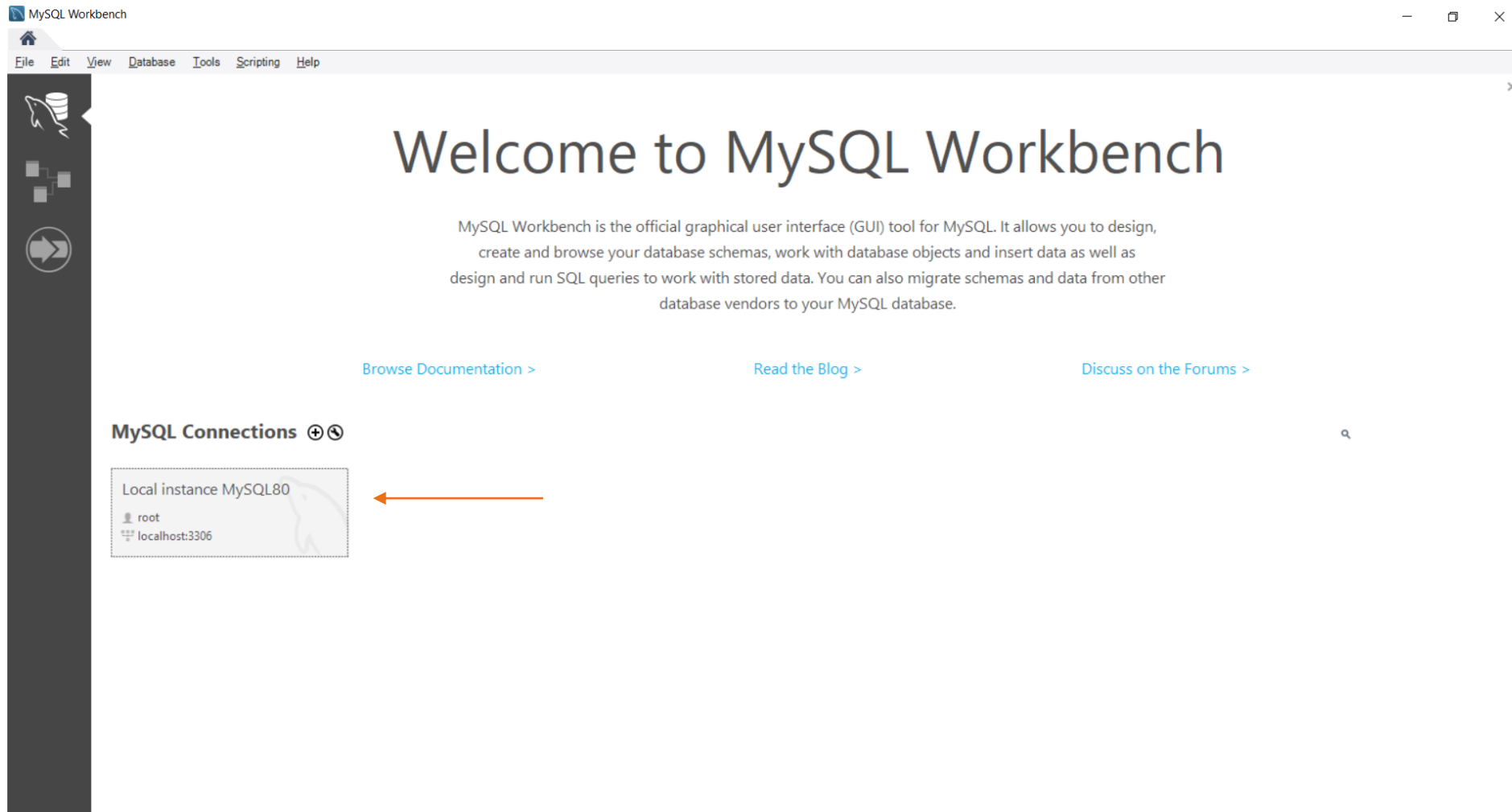


# Instalação de um SGBD - MySQL



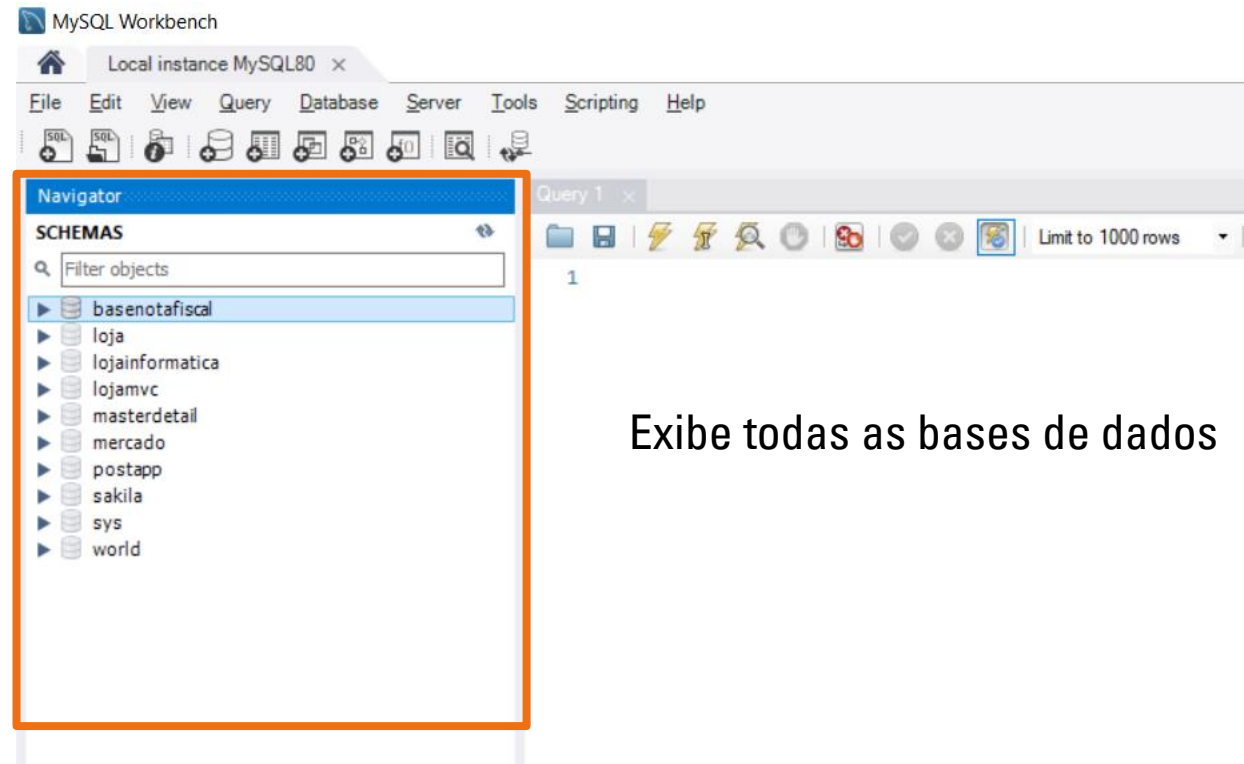
# Instalação de um SGBD - MySQL

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# Instalação de um SGBD - MySQL

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Exibe todas as bases de dados

# MariaDB

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- ❑ Recebeu o nome de uma das filhas (Maria) de seu criador:

Michael “Monty” Widenius



- ❑ Gratuito

- ❑ Surgiu como um *fork* do *MySQL* para manter as mesmas características do MySQL

- ❑ Criado em 2009 após a compra do MySQL pela Oracle.

# Instalação de um SGBD - MariaDB

[Download](#)[Documentation](#)[Contribute](#)[Server Fest](#)[Events](#)[Sponsor](#)[Blog](#)[Planet MariaDB](#)[About](#)

Latest MariaDB releases [10.8.0 \(Alpha\)](#), [10.7.1 \(RC\)](#), [10.6.5](#), [10.5.13](#), [10.4.22](#), [10.3.32](#), [10.2.41](#). [Vote on your current version.](#)

[Download MariaDB Server](#)[REST API](#)[Release Schedule](#)[Reporting Bugs](#)[View all releases for:](#)[MariaDB Server](#)[MariaDB Galera](#)[Connector/C](#)[Connector/J](#)[Connector/ODBC](#)[Connector/Python](#)[Connector/Node.js](#)

## Download MariaDB Server

MariaDB Server is one of the world's most popular open source relational databases and is available in the standard repositories of all major Linux distributions. Look for the package mariadb-server using the package manager of your operating system. Alternatively you can use the following resources:

[MariaDB Server](#)[MariaDB Repositories](#)[Connectors](#)

### MariaDB Server Version

[MariaDB Server 10.6.5](#)

Display older releases: ☐

### Operating System

[Windows](#)

### Architecture

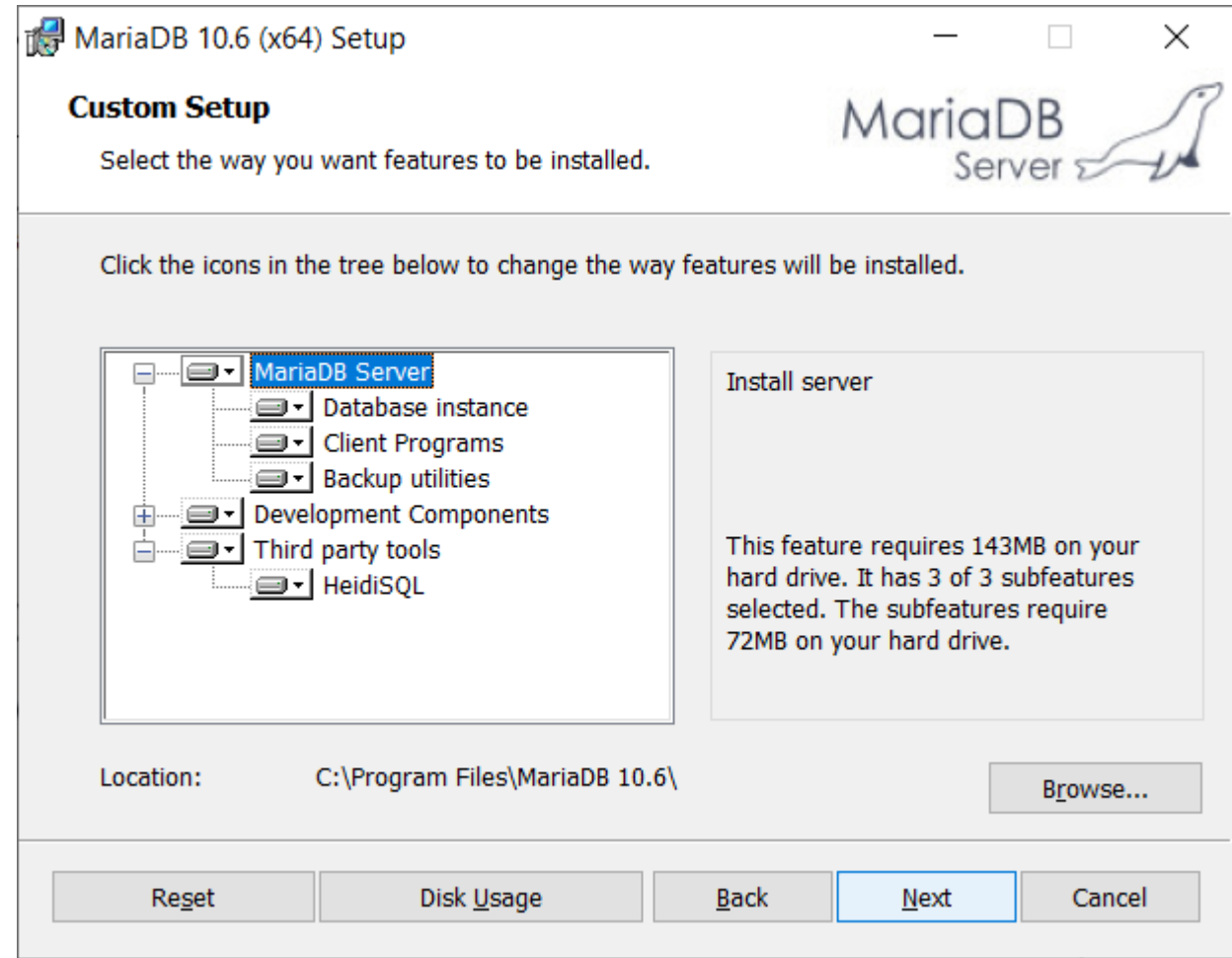
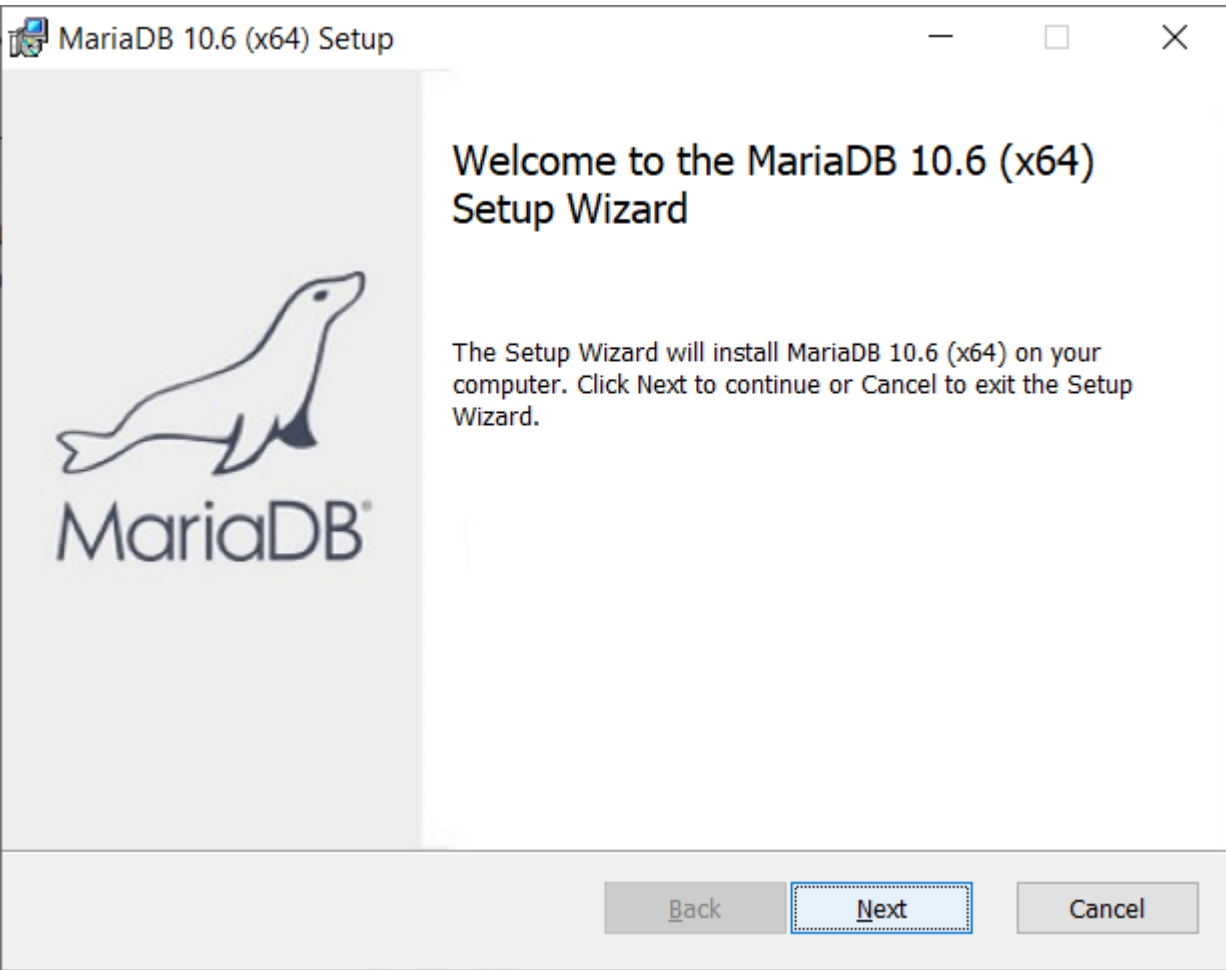
[x86\\_64](#)

### Package Type

[MSI Package](#)[Download](#)[Mirror](#)[Universidad de la República - Facultad de Derecho](#)

[https://mariadb.org/download/?t=mariadb&p=mariadb&r=10.6.5&os=windows&cpu=x86\\_64&pkg=msi&m=fder](https://mariadb.org/download/?t=mariadb&p=mariadb&r=10.6.5&os=windows&cpu=x86_64&pkg=msi&m=fder)

# Instalação de um SGBD - MariaDB



# Instalação de um SGBD - MariaDB

User settings

Default instance properties

MariaDB 10.6 (x64) database configuration

MariaDB Server

☒ **Modify password for database user 'root'**

New root password:  Enter new root password

Confirm:  Retype the password

☐ **Enable access from remote machines for 'root' user**

☐ **Use UTF8 as default server's character set**

Back Next Cancel

Database settings

Default instance properties

MariaDB 10.6 (x64) database configuration

MariaDB Server

☒ **Install as service**

Service Name:

☒ **Enable networking**

TCP port:

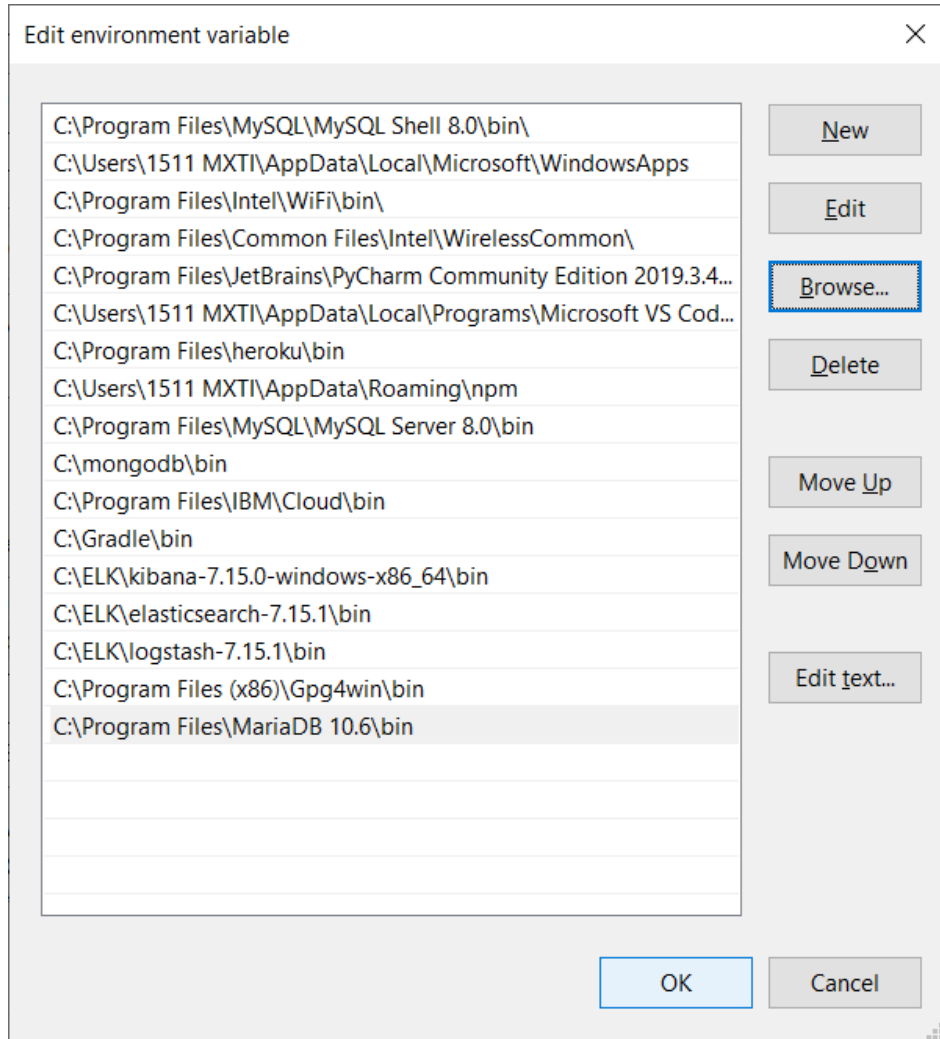
**InnoDB engine settings**

Buffer pool size:  MB

Page size:  KB

Back Next Cancel

# Instalação de um SGBD - MariaDB



`mariadb -u root -p`

```
C:\WINDOWS\system32\cmd.exe - mariadb -u root -p

C:\>mariadb -u root -p
Enter password: *****
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 9
Server version: 10.6.5-MariaDB mariadb.org binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.001 sec)
```



# Obrigado!

Contato: [proffernando.fernandes@fiap.com.br](mailto:proffernando.fernandes@fiap.com.br)