

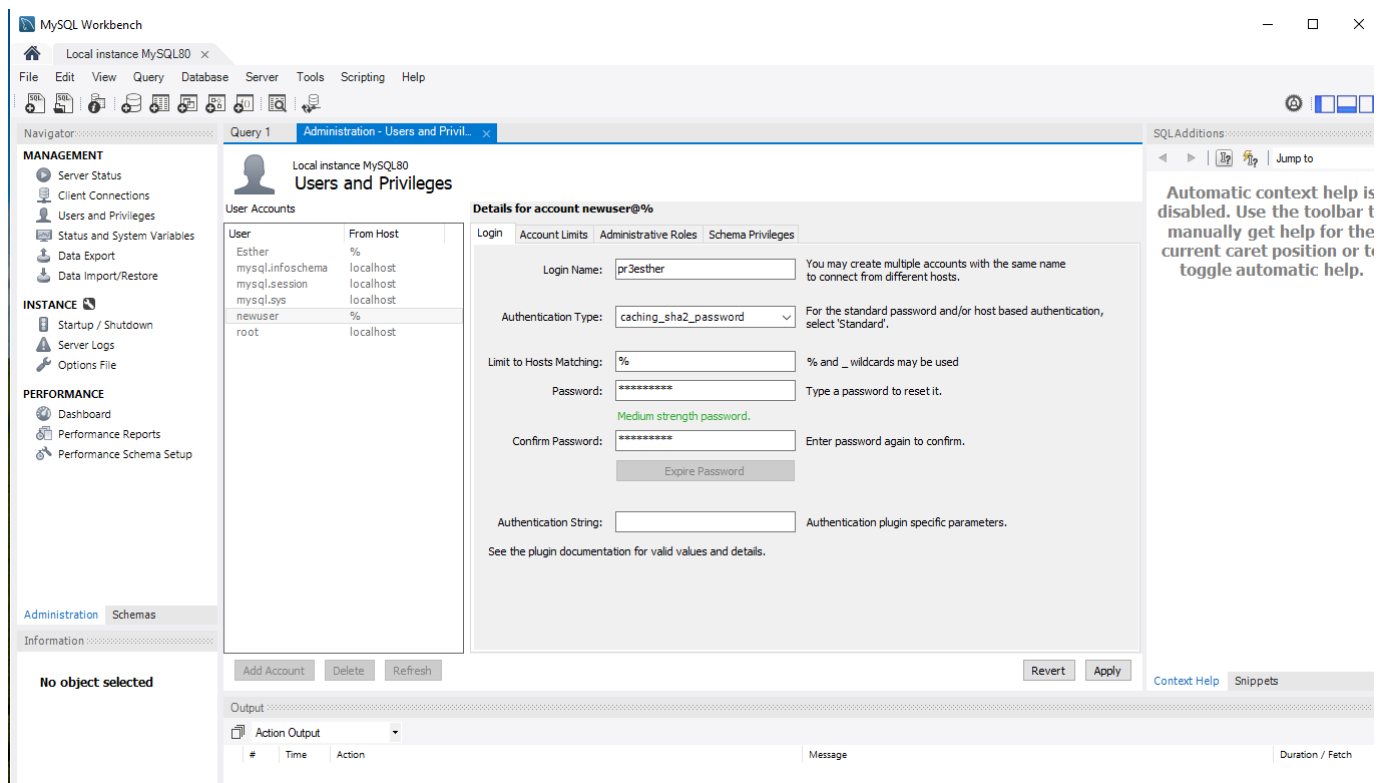
# UD 05. DISEÑO FÍSICO I

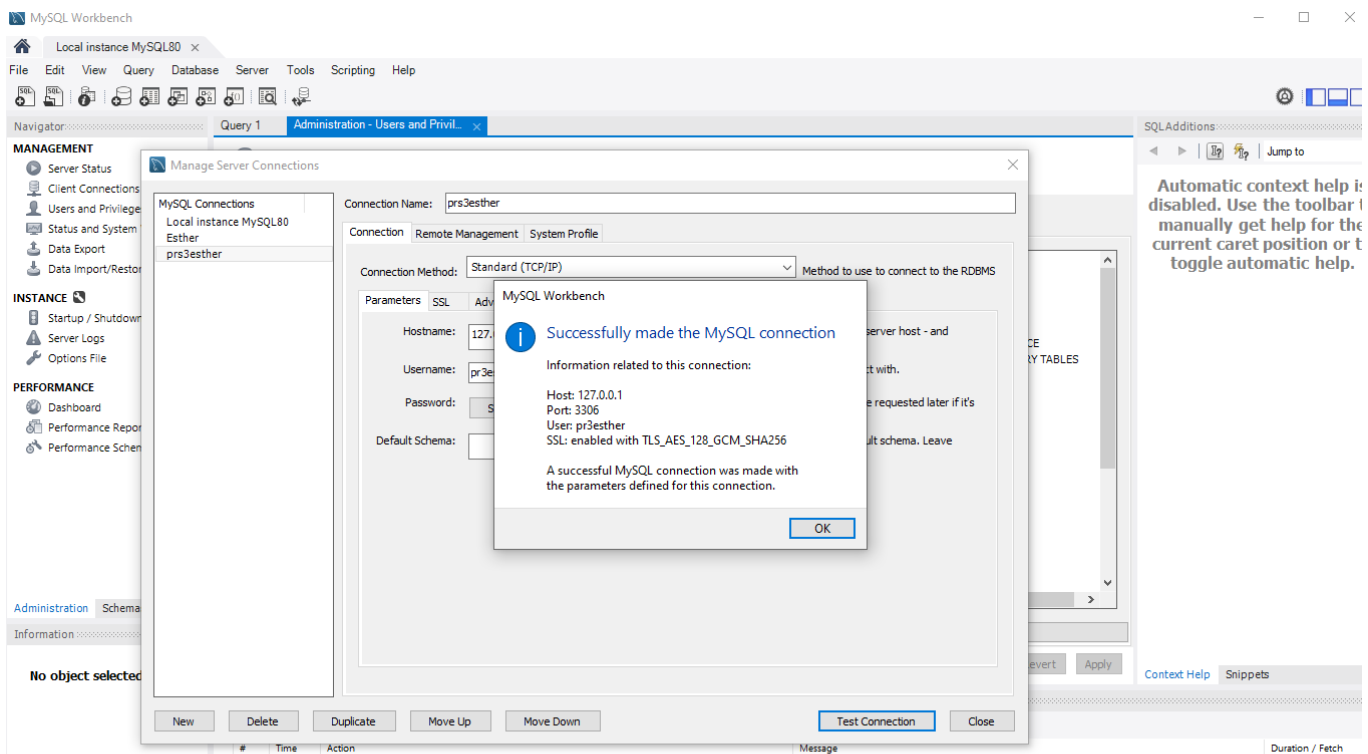
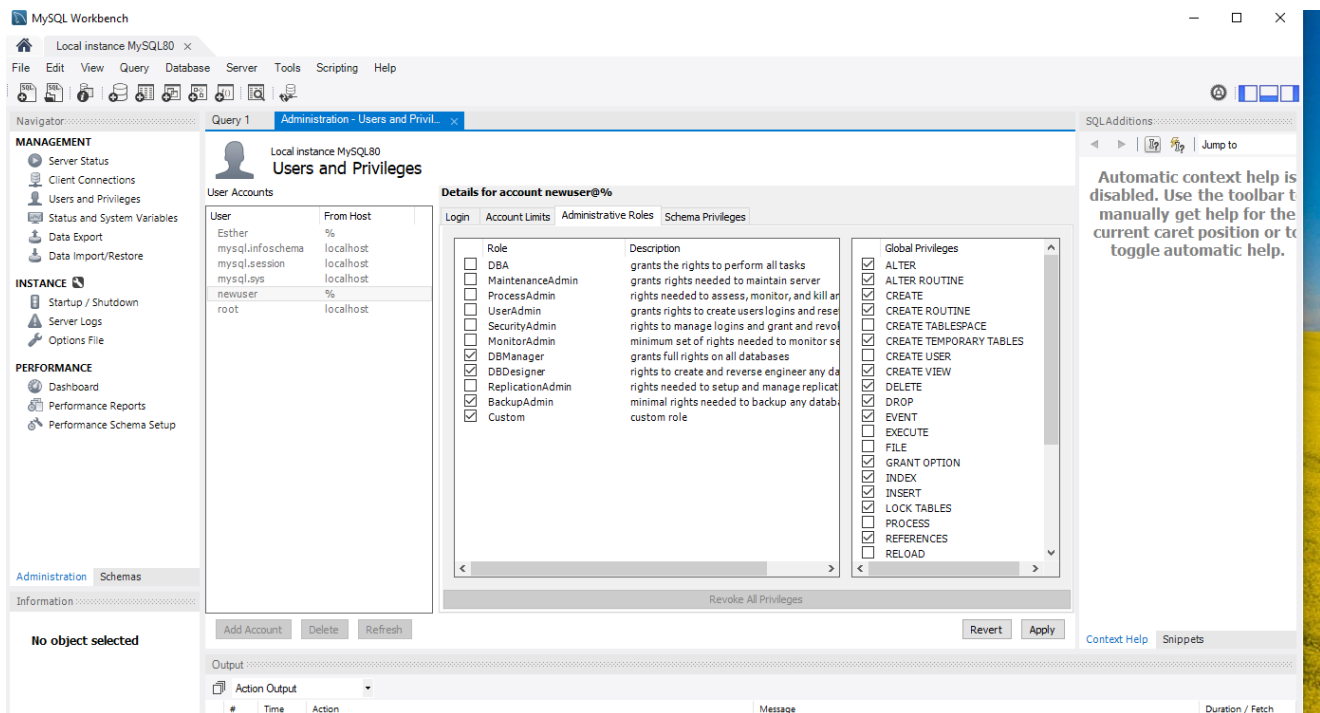
## PRÁCTICA 3

1. Nos conectamos a Workbench con el usuario root.

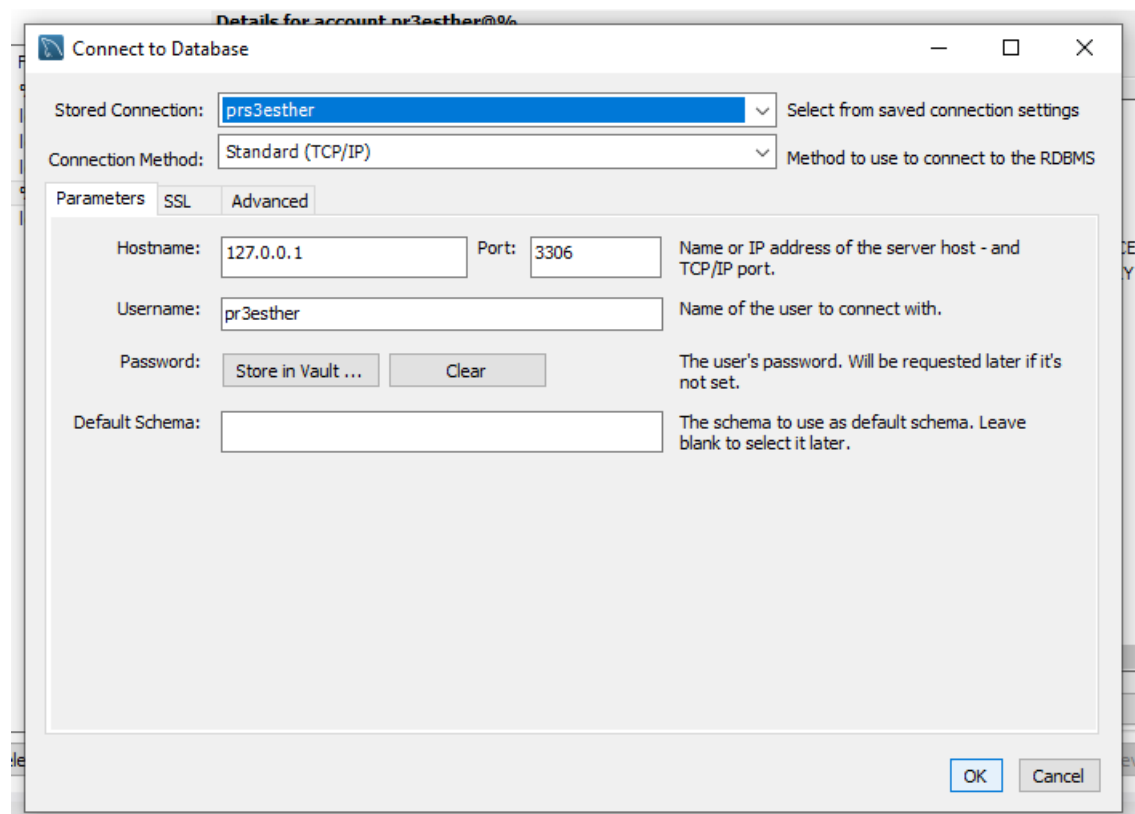
2. Creamos un usuario llamado pr3 + nuestro nombre en minúsculas (Por ejemplo, pr3jose).

Le damos el rol administrativo DBManager y le añadimos el privilegio global references (para que pueda crear claves ajenas).

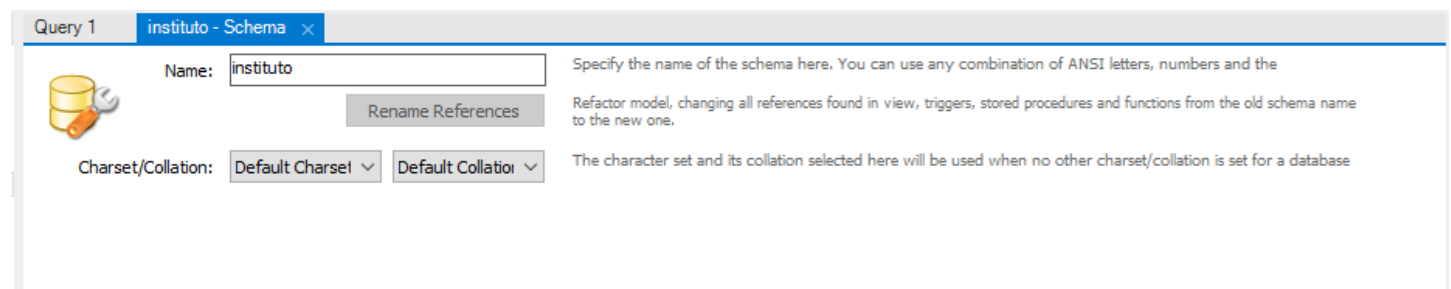


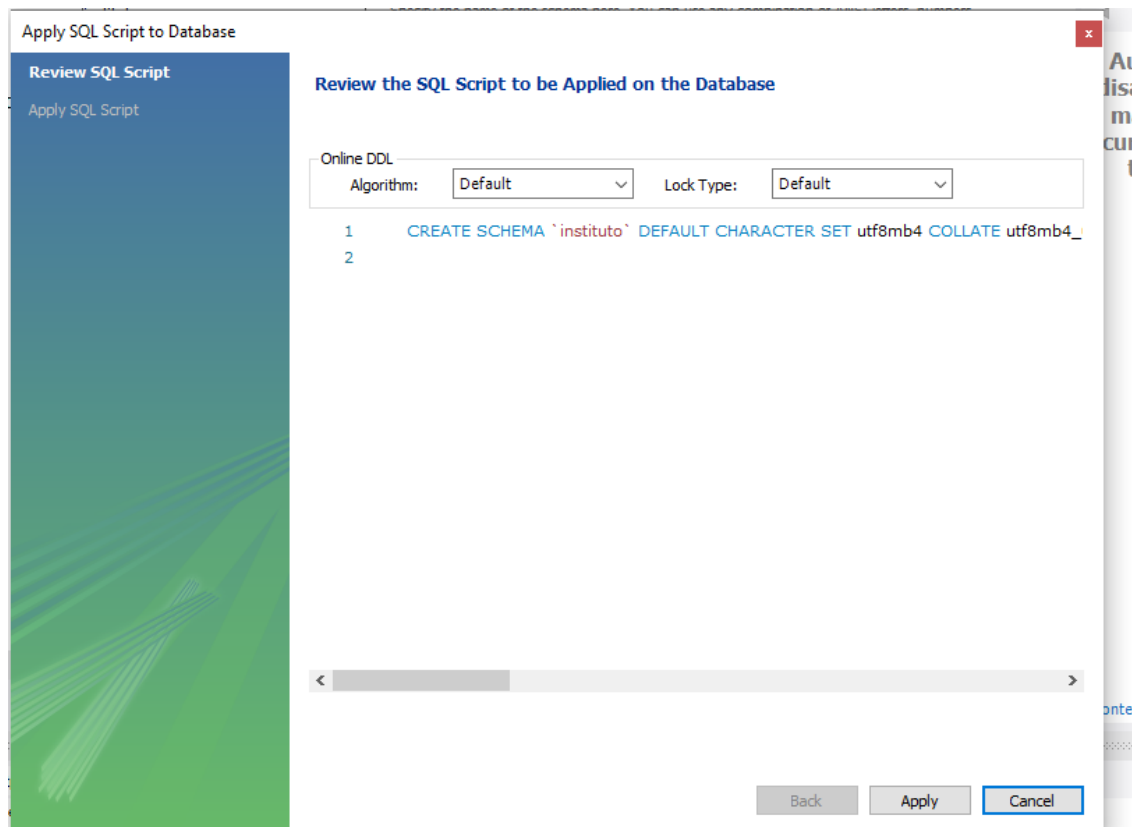


2. Nos conectamos a Workbench con el usuario creado en el punto 2.



4. Creamos una base de datos de nombre instituto.





5. En la base de datos instituto creamos las tablas según el enunciado siguiente. Se deben de crear las restricciones de cada tabla (clave primaria, campo único, claves ajenas, restricciones con check, etc.).

Enunciado:

Se desea diseñar la base de datos de un Instituto. Empezaremos almacenando datos de alumnado, asignaturas y las notas del alumnado por asignatura.

De cada alumn@ se desea guardar un ID (número único para cada alumn@ de tipo autoincremento), nombre, apellido1 y apellido2, fecha de nacimiento y de qué tipo es la matrícula del alumn@ (la matrícula puede ser 'Beca', 'Gratuita', 'Normal'. El valor por defecto de la matrícula será 'Normal').

De cada asignatura se guardará el código de la asignatura, el nombre (que no puede ser repetido) y el presupuesto que tiene la asignatura (un importe en € para gasto de material que no podrá ser negativo).

Por último, se almacenarán las notas finales del alumnado en las asignaturas. La nota será un valor numérico con dos decimales y que estará entre 0 y 10. Además se podrán almacenar unas observaciones en la nota de un alumn@ en una asignatura.

Si se intenta eliminar un alumno@ o una asignatura que tengan una nota asignada no se permitirá la eliminación.

Query 1 | **alumnado - Table** x

Table Name:  Schema: **instituto**

Charset/Collation:   Engine:

Comments:

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
idalumnado	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
nombre	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
apellido1	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
apellido2	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
fechanac	DATE	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
matricula	ENUM('beca', 'gratuit...')	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	'normal'

Column Name:  Data Type:

Charset/Collation:   Default:

Comments:

Storage: ☐ Virtual ☐ Stored

☐ Primary Key ☐ Not Null ☐ Unique

☐ Binary ☐ Unsigned ☐ Zero Fill

☐ Auto Increment ☐ Generated

Columns | Indexes | Foreign Keys | Triggers | Partitioning | Options

Apply Revert

MySQL Workbench

Esther x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

- campeonato
- empresa
- instituto**
  - Tables
    - alumnado**
    - asignaturas
    - notas
  - Views
  - Stored Procedures
  - Functions
- sakila
- sys
- world

SQL File 2\* x

```

1 CREATE TABLE `alumnado` (
2   `idalumnado` int NOT NULL,
3   `nombre` varchar(45) NOT NULL,
4   `apellido1` varchar(45) NOT NULL,
5   `apellido2` varchar(45) NOT NULL,
6   `fechanac` date NOT NULL,
7   `matricula` enum('beca', 'gratuita', 'normal') NOT NULL DEFAULT 'normal',
8   PRIMARY KEY (`idalumnado`),
9   UNIQUE KEY `idalumnado_UNIQUE` (`idalumnado`)
10 ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
11

```

MySQL Workbench

Local instance MySQL80 x prs3esther x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

- campeonato
- empresa
- instituto**
  - Tables
    - alumnado
    - asignaturas**
    - notas
  - Views
  - Stored Procedures
  - Functions
- sakila
- sys
- world

Table: **asignaturas**

Columns:

- codigo** int PK
- nombre** varchar(45)
- presupuesto** decimal(10,2) UN

Query 1 **asignaturas - Table**

Table Name: **asignaturas** Schema: **instituto**

Charset/Collation: **utf8mb4** **utf8mb4\_0900\_ai\_ci** Engine: **InnoDB**

Comments:

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
<b>codigo</b>	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>nombre</b>	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
<b>presupuesto</b>	DECIMAL(10,2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL

Column Name: Data Type: Charset/Collation: Default: Storage: ☐ Virtual ☐ Stored ☐ Primary Key ☐ Not Null ☐ Unique ☐ Binary ☐ Unsigned ☐ Zero Fill ☐ Auto Increment ☐ Generated

Columns Indexes Foreign Keys Triggers Partitioning Options

Apply Revert Context Help Snippets

Output

Action Output

# Time Action Message Duration / Fetch

MySQL Workbench

Esther x

File Edit View Query Database Server Tools Scripting Help

Navigator

SCHEMAS

Filter objects

- campeonato
- empresa
- instituto**
  - Tables
    - alumnado
    - asignaturas**
    - notas
  - Views
  - Stored Procedures
  - Functions
- sakila
- sys
- world

SQL File 2\* x

Limit to 1000 rows

```

1 CREATE TABLE `alumnado` (
2   `idalumnado` int NOT NULL,
3   `nombre` varchar(45) NOT NULL,
4   `apellido1` varchar(45) NOT NULL,
5   `apellido2` varchar(45) NOT NULL,
6   `fechanac` date NOT NULL,
7   `matricula` enum('beca','gratuita','normal') NOT NULL DEFAULT 'normal',
8   PRIMARY KEY (`idalumnado`),
9   UNIQUE KEY `idalumnado_UNIQUE` (`idalumnado`)
10 ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
11 CREATE TABLE `asignaturas` (
12   `codigo` int NOT NULL,
13   `nombre` varchar(45) DEFAULT NULL,
14   `presupuesto` decimal(10,2) unsigned DEFAULT NULL,
15   PRIMARY KEY (`codigo`),
16   UNIQUE KEY `nombre_UNIQUE` (`nombre`),
17   CONSTRAINT `presupuesto_chk` CHECK ((`presupuesto` >= 0))
18 ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
19

```

MySQL Workbench

Local instance MySQL80 x prs3esther x

File Edit View Query Database Server Tools Scripting Help

Navigator: Query 1 notas - Table x SQLAdditions: Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

SCHEMAS

Filter objects

campeonato  
empresa  
instituto  
alumnado  
asignaturas  
notas  
Views  
Stored Procedures  
Functions  
sakila  
sys  
world

Table Name: notas Schema: instituto  
Charset/Collation: utf8mb4 utf8mb4\_0900\_ai\_ci Engine: InnoDB

Comments:

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
idnota	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
idalumnado	INT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
codigoasig	INT	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
nota	DECIMAL(4,2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Column Name: Data Type: Charset/Collation: Default: Comments: Storage: ☐ Virtual ☐ Stored ☐ Primary Key ☐ Not Null ☐ Unique ☐ Binary ☐ Unsigned ☐ Zero Fill ☐ Auto Increment ☐ Generated

Columns Indexes Foreign Keys Triggers Partitioning Options

Apply Revert

Output: Action Output # Time Action Message Duration / Fetch

Table: notas  
Columns: idnota int PK, idalumnado int, codigoasig int, nota decimal(4,2)

MySQL Workbench

Local instance MySQL80 x prs3esther x

File Edit View Query Database Server Tools Scripting Help

Navigator: Query 1 notas - Table x SQLAdditions: Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

SCHEMAS

Filter objects

campeonato  
empresa  
instituto  
alumnado  
asignaturas  
notas  
Views  
Stored Procedures  
Functions  
sakila  
sys  
world

Table Name: notas Schema: instituto  
Charset/Collation: utf8mb4 utf8mb4\_0900\_ai\_ci Engine: InnoDB

Comments:

Foreign Key Name	Referenced Table	Column	Referenced Column
codigoasig_fk	instituto, asignaturas		
idalumno_fk	instituto, alumnado		

Foreign Key Options: On Update: On Delete: ☐ Skip in SQL generation

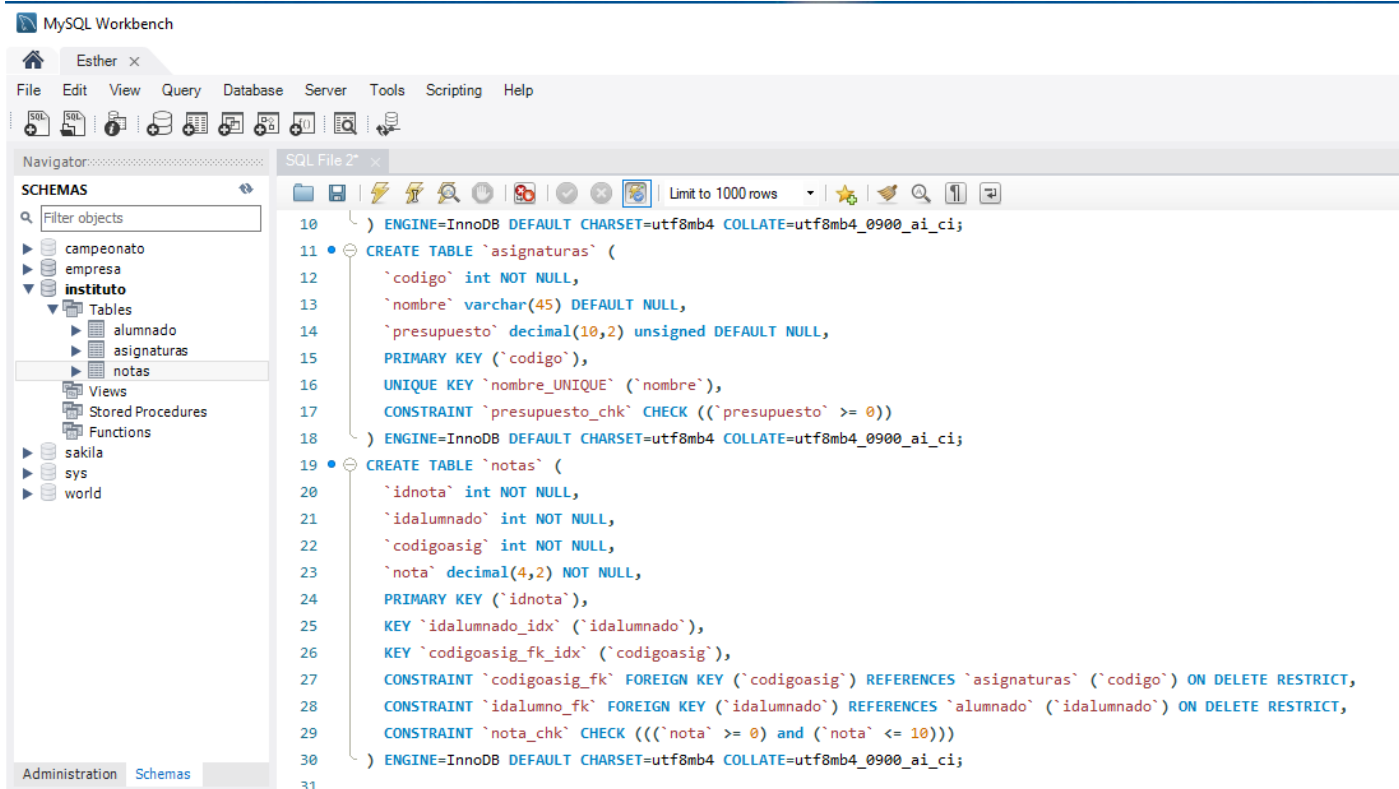
Foreign Key Comment:

Columns Indexes Foreign Keys Triggers Partitioning Options

Apply Revert

Output: Action Output # Time Action Message

Table: notas  
Columns: idnota int PK, idalumnado int, codigoasig int, nota decimal(4,2)

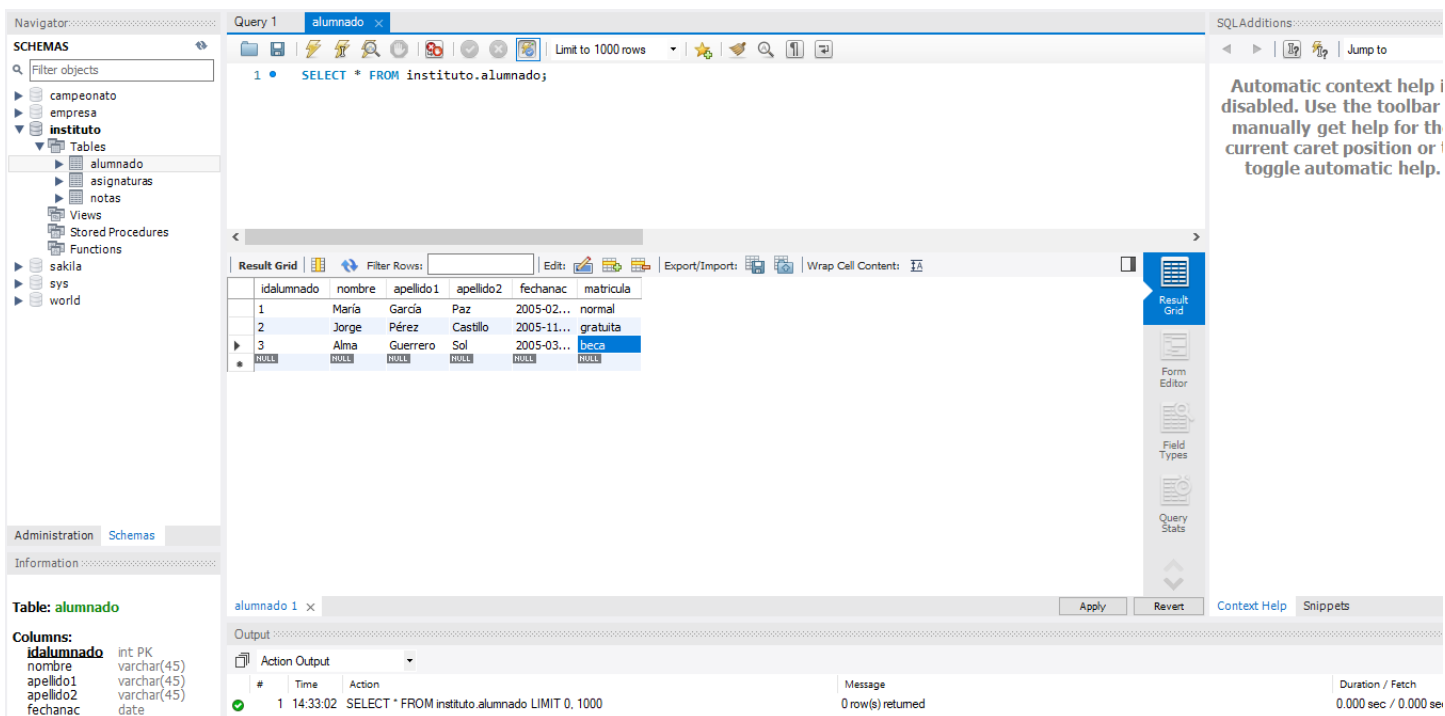


6. Introducimos datos en cada tabla. En concreto:

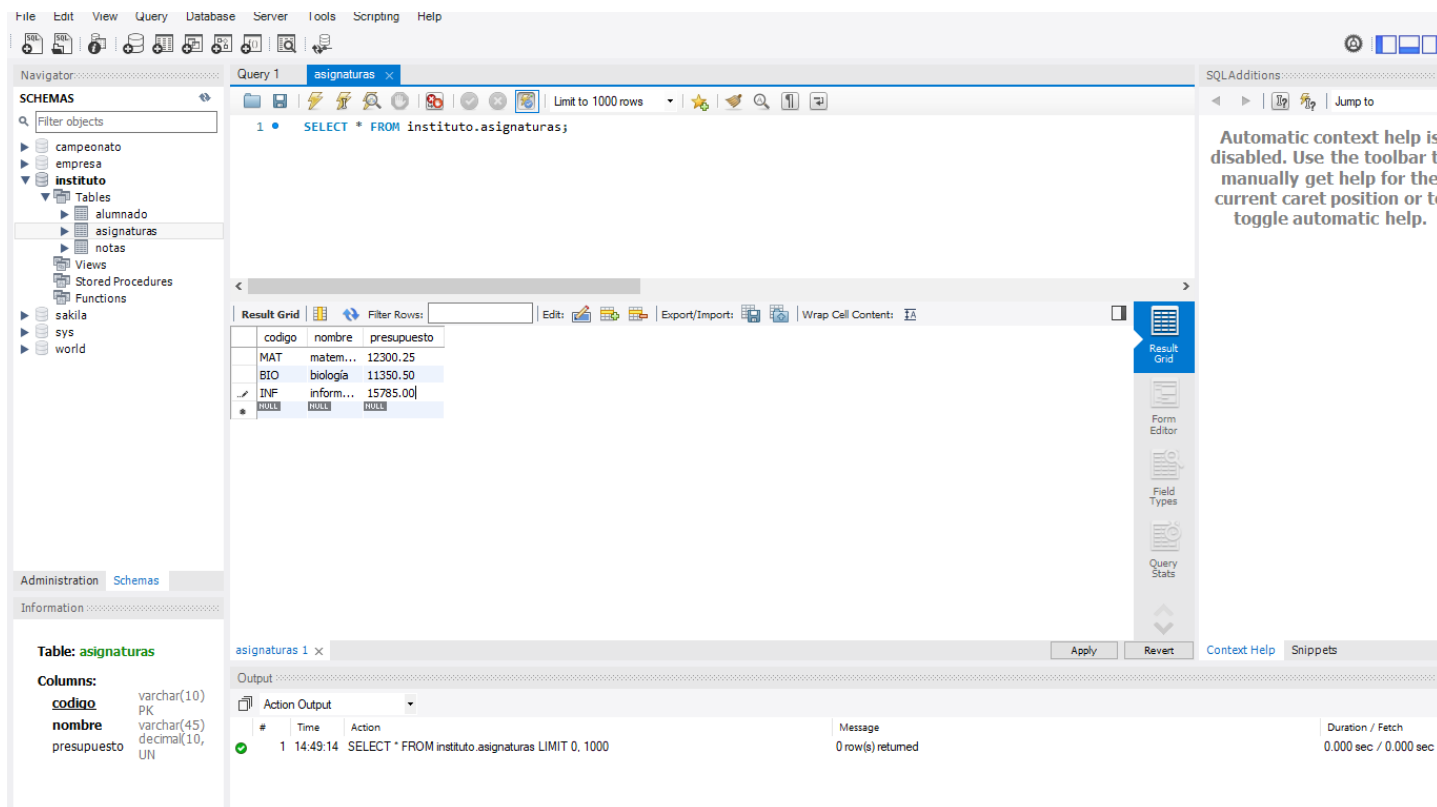
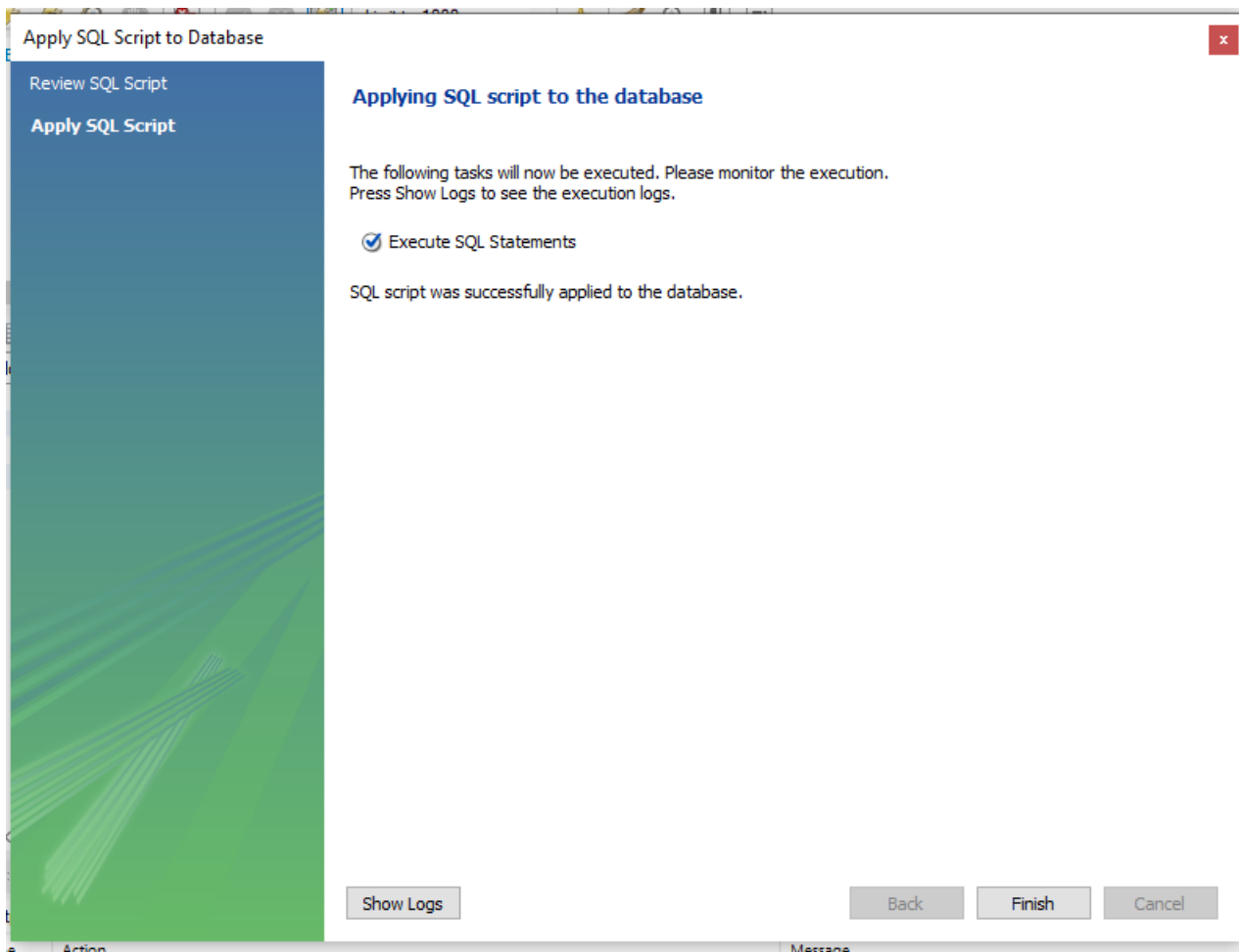
3 alumn@s.

3 asignaturas.

5 notas.







## Apply SQL Script to Database

Review SQL Script

Apply SQL Script

### Applying SQL script to the database

The following tasks will now be executed. Please monitor the execution. Press Show Logs to see the execution logs.

☒ Execute SQL Statements

SQL script was successfully applied to the database.

Show Logs

Back

Finish

Cancel

Local instance MySQL80 x prs3esther x

File Edit View Query Database Server Tools Scripting Help

Navigator:.....

SCHEMAS

Filter objects

- campeonato
- empresa
- instituto
  - Tables
    - alumnado
    - asignaturas
    - notas
  - Views
  - Stored Procedures
  - Functions
- sakila
- sys
- world

Query 1 notas x

Limit to 1000 rows

1 • SELECT \* FROM instituto.notas;

Result Grid

	idnota	idalumnado	codigoasig	nota
1	1	MAT	8.20	
2	1	BIO	5.50	
3	2	MAT	7.25	
4	3	INF	6.75	
5	2	INF	3.75	
TOTAL				

Administration Schemas

Information

Table: notas

Columns:

- idnota int PK
- idalumnado int
- codigoasig varchar(10)
- nota decimal(4,2)

SQLAdditions:.....

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

Result Grid

Form Editor

Field Types

Query Stats

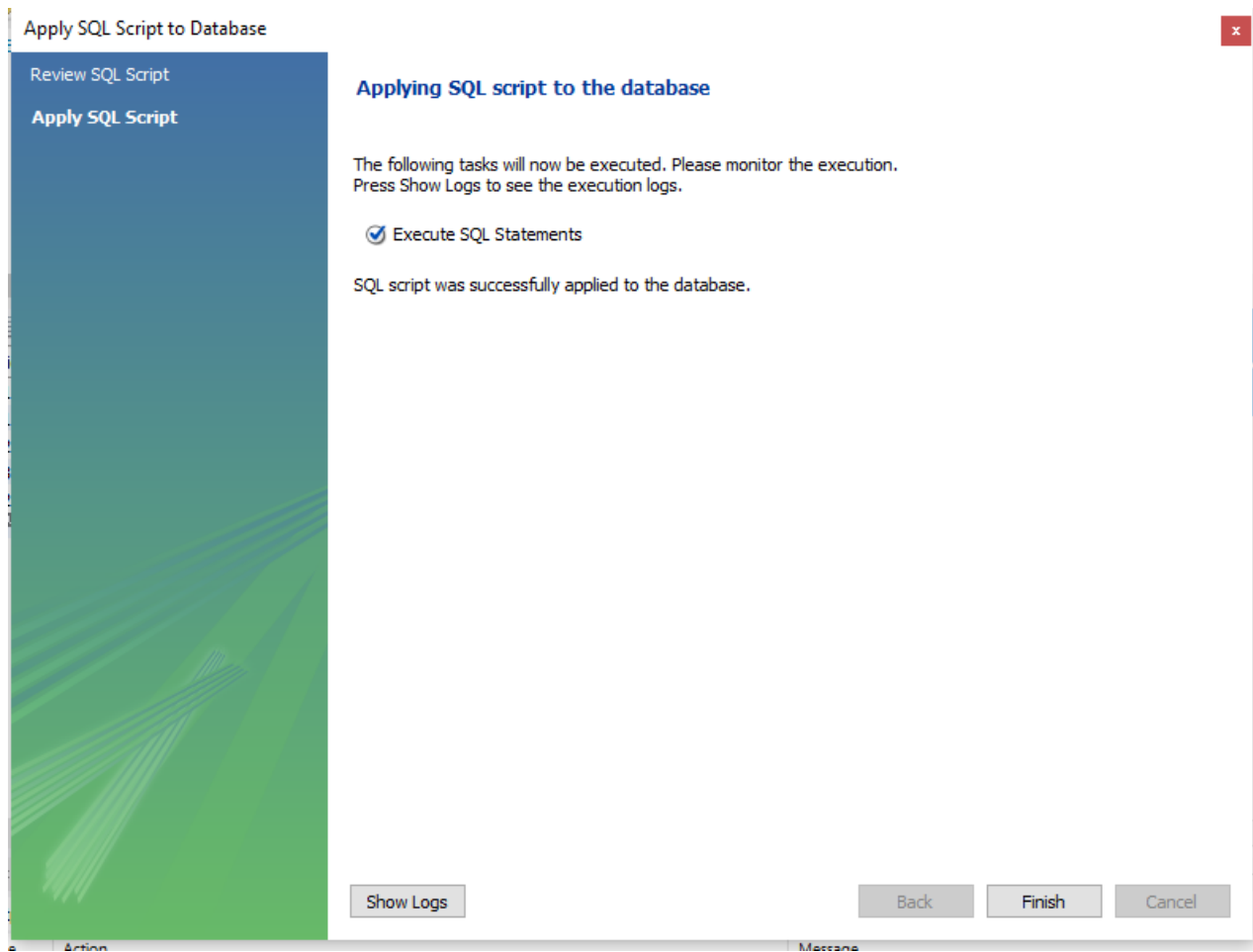
notes 1 x

Apply Revert Context Help Snippets

Output

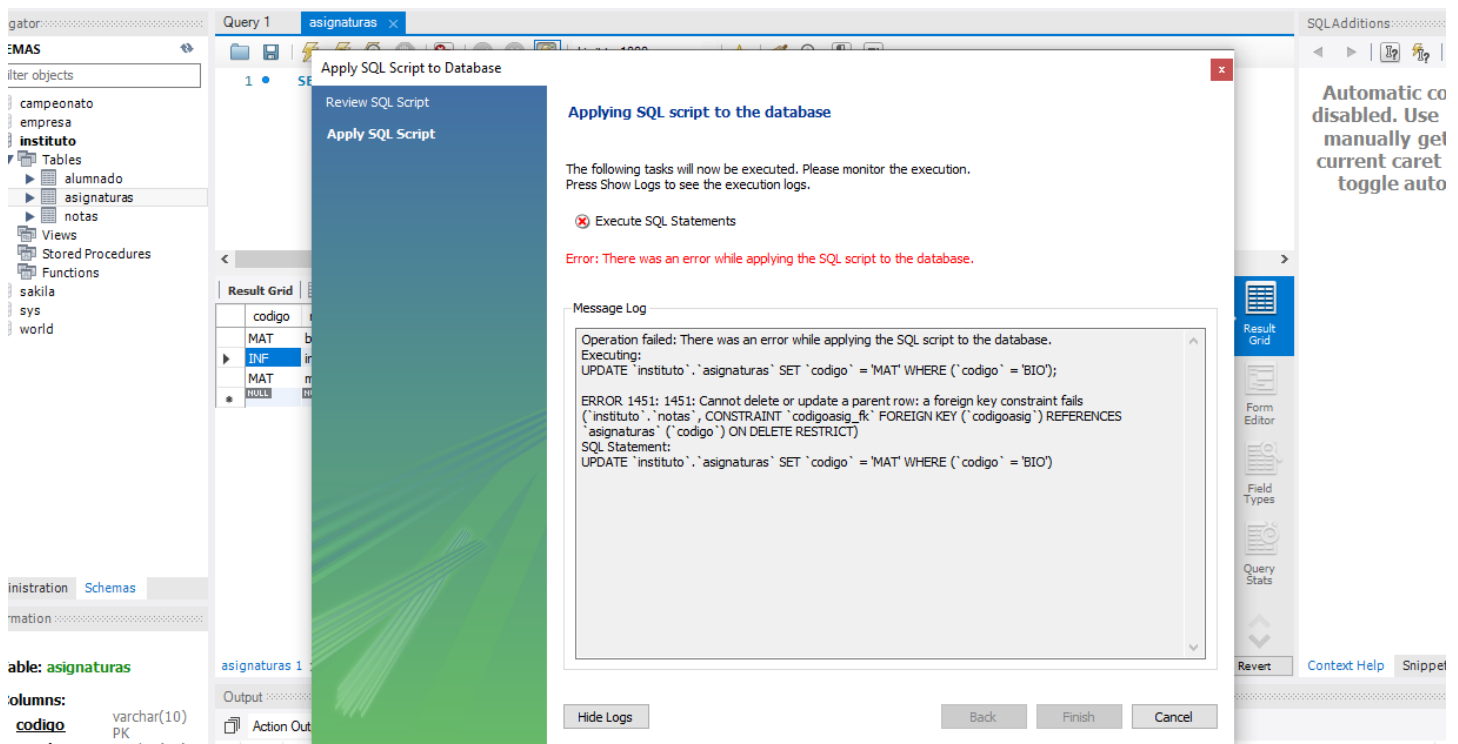
Action Output

#	Time	Action	Message	Duration / Fetch
1	14:57:32	SELECT * FROM instituto.notas LIMIT 0, 1000	0 row(s) returned	0.015 sec / 0.000 sec

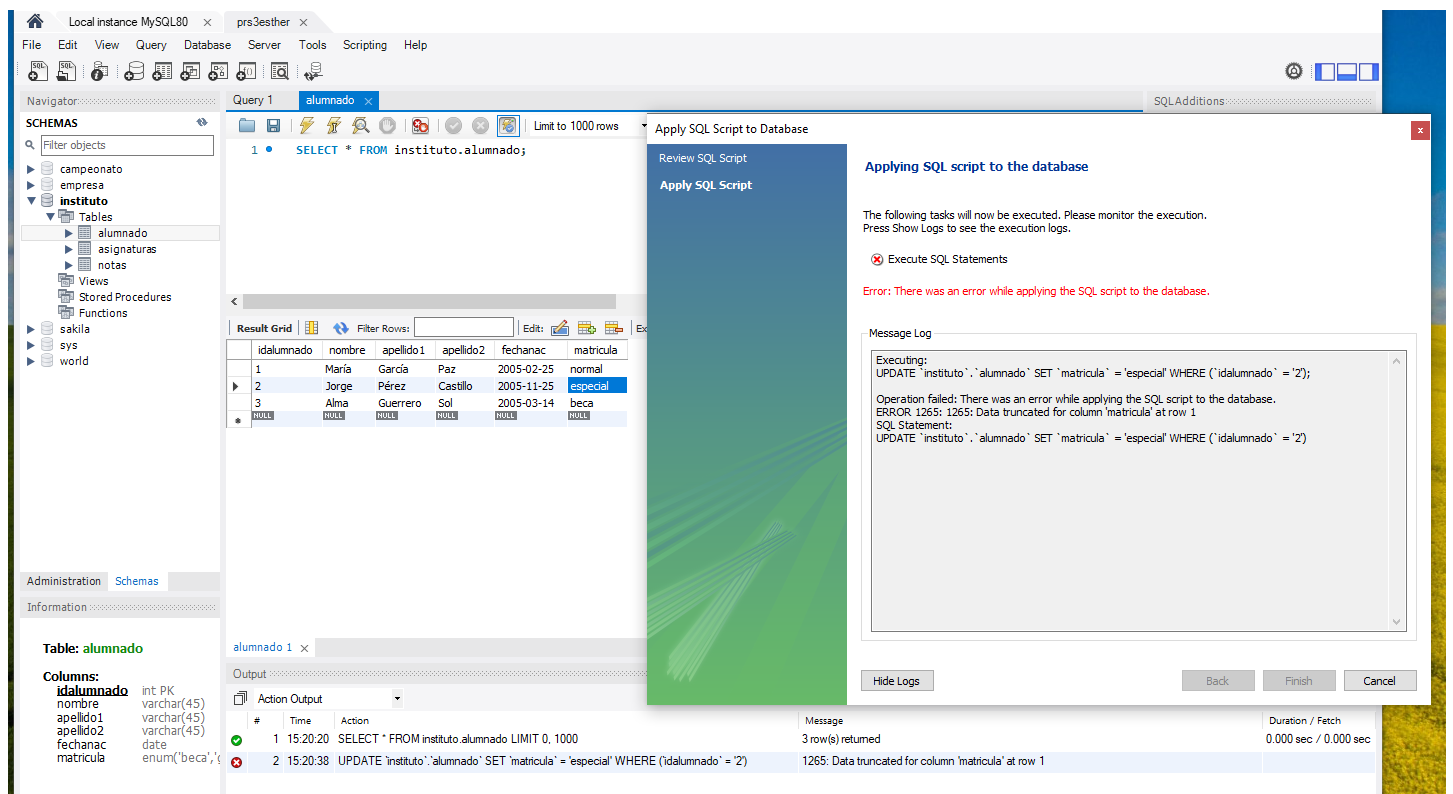


7. Realizamos las siguientes acciones y comprobamos los errores producidos:

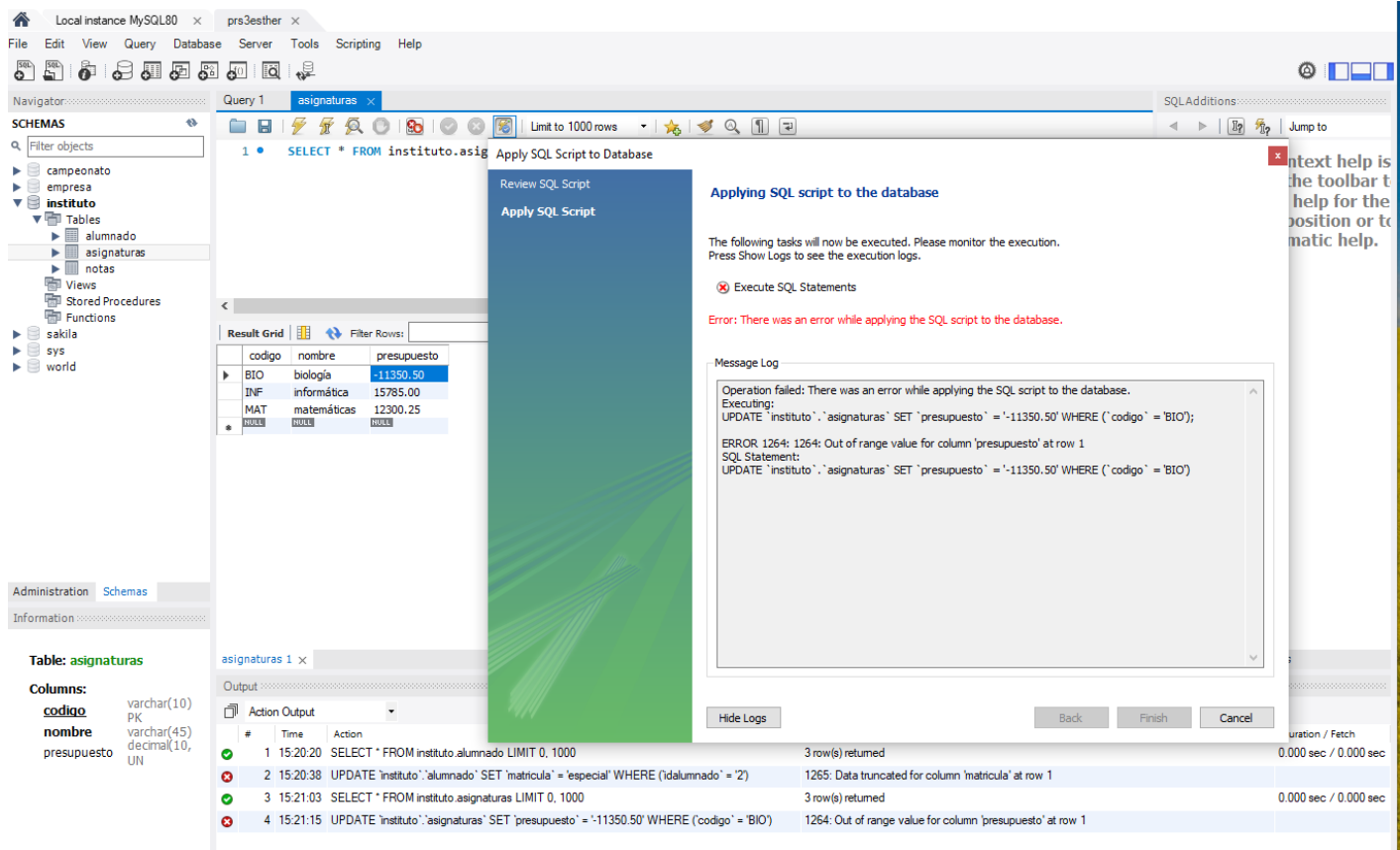
a) Modificamos el Código de una asignatura para que coincida con el código de otra asignatura.



b) Modificamos el valor introducido de una matrícula introduciendo el valor ‘Especial’.



c) Ponemos un presupuesto negativo en una asignatura.



d) Modificamos el nombre de una asignatura para que coincida con el nombre de otra asignatura.

Local instance MySQL80 x prs3esther x

File Edit View Query Database Server Tools Scripting Help

Navigator: Query 1 asignaturas x SQLAdditions: x Jump to

**SCHEMAS**

Filter objects

- campeonato
- empresa
- instituto**
  - alumnado
  - asignaturas**
  - notas
- Views
- Stored Procedures
- Functions
- sakila
- sys
- world

**Table: asignaturas**

**Columns:**

- codigo** varchar(10) PK
- nombre** varchar(45)
- presupuesto decimal(10, UN

**Result Grid**

	codigo	nombre	presupuesto
BIO	biología	11350.50	
INF	biología	15785.00	
MAT	matemáticas	12300.25	
	NULO	NULO	NULO

**Apply SQL Script to Database**

Review SQL Script

Apply SQL Script

**Applying SQL script to the database**

The following tasks will now be executed. Please monitor the execution. Press Show Logs to see the execution logs.

☒ Execute SQL Statements

**Error: There was an error while applying the SQL script to the database.**

**Message Log**

Operation failed: There was an error while applying the SQL script to the database.  
Executing:  
UPDATE `instituto`.`asignaturas` SET `nombre` = 'biología' WHERE (`codigo` = 'INF');  
**ERROR 1062: 1062: Duplicate entry 'biología' for key 'asignaturas.nombre\_UNIQUE'**  
SQL Statement:  
UPDATE `instituto`.`asignaturas` SET `nombre` = 'biología' WHERE (`codigo` = 'INF')

**asignaturas 1 x**

**Action Output**

#	Time	Action	Message	Duration / Fetch
1	15:20:20	SELECT * FROM instituto.alumnado LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
2	15:20:38	UPDATE `instituto`.`alumnado` SET `matricula` = 'especial' WHERE (`idalumnado` = '2')	1265: Data truncated for column 'matricula' at row 1	
3	15:21:03	SELECT * FROM instituto.asignaturas LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
4	15:21:15	UPDATE `instituto`.`asignaturas` SET `presupuesto` = '-11350.50' WHERE (`codigo` = 'BIO')	1264: Out of range value for column 'presupuesto' at row 1	
5	15:21:58	SELECT * FROM instituto.asignaturas LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
6	15:22:21	UPDATE `instituto`.`asignaturas` SET `nombre` = 'biología' WHERE (`codigo` = 'INF')	1062: Duplicate entry 'biología' for key 'asignaturas.nombre_UNIQUE'	

Object Info Session

e) Dejamos a nulo el nombre de un alumn@.

Local instance MySQL80 x prs3esther x

File Edit View Query Database Server Tools Scripting Help

Navigator: Query 1 **alumnado** x SQLAdditions

**SCHEMAS**

Filter objects

- campeonato
- empresa
- instituto**
  - Tables
    - alumnado
    - asignaturas
    - notas
  - Views
  - Stored Procedures
  - Functions
- sakila
- sys
- world

Administration Schemas

Information

**Table: alumnado**

**Columns:**

- idalumnado int PK
- nombre varchar(45)
- apellido1 varchar(45)
- apellido2 varchar(45)
- fechanac date
- matricula enum('beca',')

**Result Grid**

idalumnado	nombre	apellido1	apellido2
1	NULL	García	Paz
2	Jorge	Pérez	Castillo
3	Alma	Guerrero	Sol
4	NULL	NULL	NULL

**Apply SQL Script to Database**

Review SQL Script

Apply SQL Script

**Applying SQL script to the database**

The following tasks will now be executed. Please monitor the execution. Press Show Logs to see the execution logs.

☒ Execute SQL Statements

Error: There was an error while applying the SQL script to the database.

**Message Log**

Operation failed: There was an error while applying the SQL script to the database.

Executing:  
UPDATE 'instituto', 'alumnado' SET 'nombre' = NULL WHERE ('idalumnado' = '1');

ERROR 1048: 1048: Column 'nombre' cannot be null

SQL Statement:  
UPDATE 'instituto', 'alumnado' SET 'nombre' = NULL WHERE ('idalumnado' = '1')

Hide Logs

Back Finish Cancel

**Output**

#	Time	Action	Message	Duration / Fetch
1	15:24:04	SELECT * FROM instituto.alumnado LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
2	15:24:23	UPDATE 'instituto', 'alumnado' SET 'nombre' = NULL WHERE ('idalumnado' = '1')	1048: Column 'nombre' cannot be null	

f) Introducimos una nota que no esté entre 0 y 10.

Local instance MySQL80 x prs3esther x

File Edit View Query Database Server Tools Scripting Help

Navigator: Query 1 **notas** x SQLAdditions

**SCHEMAS**

Filter objects

- campeonato
- empresa
- instituto**
  - Tables
    - alumnado
    - asignaturas
    - notas
  - Views
  - Stored Procedures
  - Functions
- sakila
- sys
- world

Administration Schemas

Information

**Table: notas**

**Columns:**

- idnota int PK
- idalumnado int
- codigoasig varchar(10)
- nota decimal(4,2)

**Result Grid**

idnota	idalumnado	codigoasig	nota
1	1	MAT	8.20
2	1	BIO	5.50
3	2	MAT	7.25
4	3	INF	6.75
5	2	INF	12.25
6	NULL	NULL	NULL

**Apply SQL Script to Database**

Review SQL Script

Apply SQL Script

**Applying SQL script to the database**

The following tasks will now be executed. Please monitor the execution. Press Show Logs to see the execution logs.

☒ Execute SQL Statements

Error: There was an error while applying the SQL script to the database.

**Message Log**

Operation failed: There was an error while applying the SQL script to the database.

Executing:  
UPDATE 'instituto', 'notas' SET 'nota' = '12.25' WHERE ('idnota' = '5');

ERROR 3819: 3819: Check constraint 'nota\_chk' is violated.

SQL Statement:  
UPDATE 'instituto', 'notas' SET 'nota' = '12.25' WHERE ('idnota' = '5')

Hide Logs

Back Finish Cancel

**Output**

#	Time	Action	Message	Duration / Fetch
1	15:24:04	SELECT * FROM instituto.alumnado LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
2	15:24:23	UPDATE 'instituto', 'alumnado' SET 'nombre' = NULL WHERE ('idalumnado' = '1')	1048: Column 'nombre' cannot be null	
3	15:25:48	SELECT * FROM instituto.notas LIMIT 0, 1000	5 row(s) returned	0.000 sec / 0.000 sec
4	15:26:13	UPDATE 'instituto', 'notas' SET 'nota' = '12.25' WHERE ('idnota' = '5')	3819: Check constraint 'nota_chk' is violated.	

g) Intentamos eliminar un alumno que tenga una nota asignada en alguna asignatura.

The screenshot shows the MySQL Workbench interface. On the left, the 'SCHEMAS' pane displays the database structure, including the 'instituto' database and its tables: 'alumnado', 'asignaturas', 'notas', 'Views', 'Stored Procedures', and 'Functions'. The 'alumnado' table is selected. The main query editor shows a query: `SELECT * FROM instituto.alumnado;`. The 'Result Grid' displays the data for the 'alumnado' table, with columns: 'idalumnado', 'nombre', 'apellido1', 'apellido2', 'fechanac', and 'matricula'. A context menu is open over the first row, with the 'Delete Row(s)' option highlighted. The 'Information' pane on the left shows the table structure for 'alumnado':

Columns:	
idalumnado	int PK
nombre	varchar(45)
apellido1	varchar(45)
apellido2	varchar(45)
fechanac	date
matricula	enum('beca', 'normal', 'gratuita')

The 'Message' pane at the bottom shows: '3 row(s) returned'.

The screenshot shows the MySQL Workbench interface with an error dialog box open. The dialog box is titled 'Apply SQL Script to Database' and contains the following text:

**Applying SQL script to the database**

The following tasks will now be executed. Please monitor the execution. Press Show Logs to see the execution logs.

☒ Execute SQL Statements

**Error: There was an error while applying the SQL script to the database.**

**Message Log**

```
Operation failed: There was an error while applying the SQL script to the database.
Executing:
DELETE FROM `instituto`.`alumnado` WHERE (`idalumnado` = '1');

ERROR 1451: 1451: Cannot delete or update a parent row: a foreign key constraint fails
(`instituto`.`notas`, CONSTRAINT `idalumno_fk` FOREIGN KEY (`idalumnado`) REFERENCES
`alumnado` (`idalumnado`) ON DELETE RESTRICT)
SQL Statement:
DELETE FROM `instituto`.`alumnado` WHERE (`idalumnado` = '1')
```

The background shows the same 'alumnado' table data as the previous screenshot. The 'Message' pane at the bottom shows the error message: '1451: Cannot delete or update a parent row: a foreign key constraint fails ('instituto'.notas', CO...'



