Relational Databases

Integration of PHP and MySQL

Web Development and Security (ZEIT3119)

Week 7

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Revision

What are the common uses of PHP?

- PHP can generate dynamic page content
- PHP can create, open, read, write, delete, and close files on the server
- PHP can collect form data
- PHP can send and receive cookies
- PHP can add, delete, modify data in your database
- PHP can be used to control user-access
- PHP can encrypt data
- It is embedded in HTML files but all the PHP tags are replaced by the server before anything is sent to the web browser

Revision

What is the difference between static and dynamic pages?

Static Page

- In static websites, content can’t be changed after running the script
- You cannot change anything in the site as it is predefined
- Example: Wikipedia

Dynamic Page

- Content of script can be changed at the run time
- Its content is regenerated every time a user visits or reloads.
- Example: E-bay, Amazon, Netflix, shopping website.

Revision

PHP forms

GET vs POST

- $_GET is an array of variable names and values sent by the HTTP GET method via the URL parameters.
  - Form data is visible to everyone
  - It is possible to bookmark the page
  - The limitation is about 2000 characters
  - May be used for sending non-sensitive data (no passwords)
- $_POST is an array of variables passed to the current script via the HTTP POST method
  - Information is invisible to everyone
  - No limits
  - Supports advanced functionality such as multi-part binary input while uploading files to server

Outline

- Data Modelling (Slides 6-11)
- Relational Databases and SQL (Slides 12-39)
- MySQL (Slides 40-59)
- Integrating PHP and MySQL (Slides 60-71)

Database Design

Before creating and using a database, we need to design it.

We need to consider

- What tables, keys, and constraints are needed?
- What is the database going to be used for?

Conceptual design

- Build a model independent of the choice of DBMS

Logical design

- Create the database in a given DBMS

Physical design

- How the database is stored on hardware

Entity/Relationship Modelling

E/R Modelling is used for conceptual design

- Entities - objects or items of interest
- Attributes - facts about, or properties of, an entity
- Relationships - links between entities

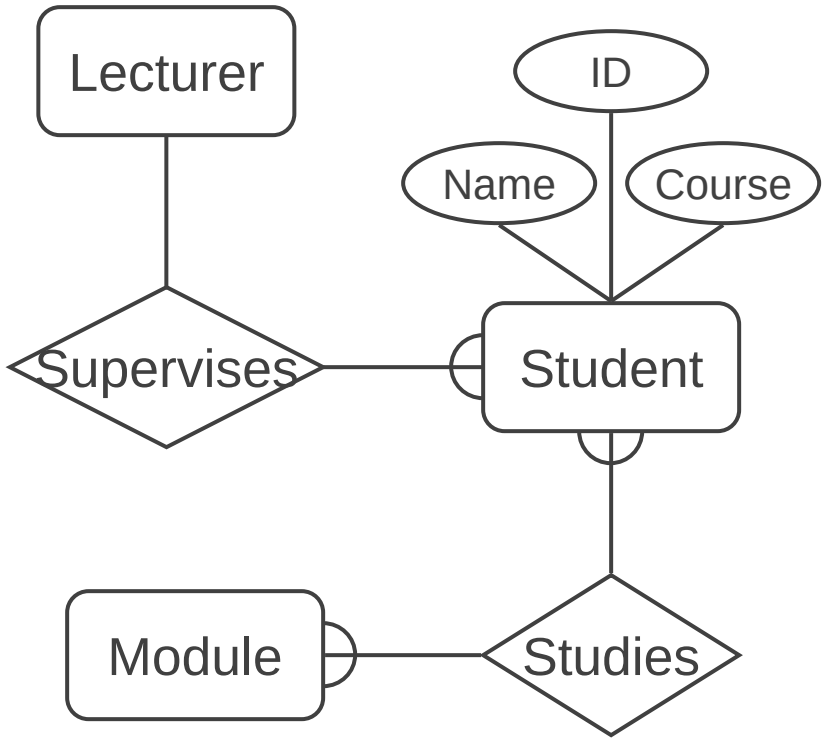
Example

In a University database we may have entities for Students, Modules and Lecturers. Students may have attributes such as their ID, Name, and Course, and can have relationships with Modules (enrolment) and Lecturers (tutor/tutee)

Entity/Relationship Diagrams

E/R Models are often represented as E/R diagrams that

- Give a conceptual view of the database
- Are independent of the choice of DBMS
- Can identify some problems in a design



Entities

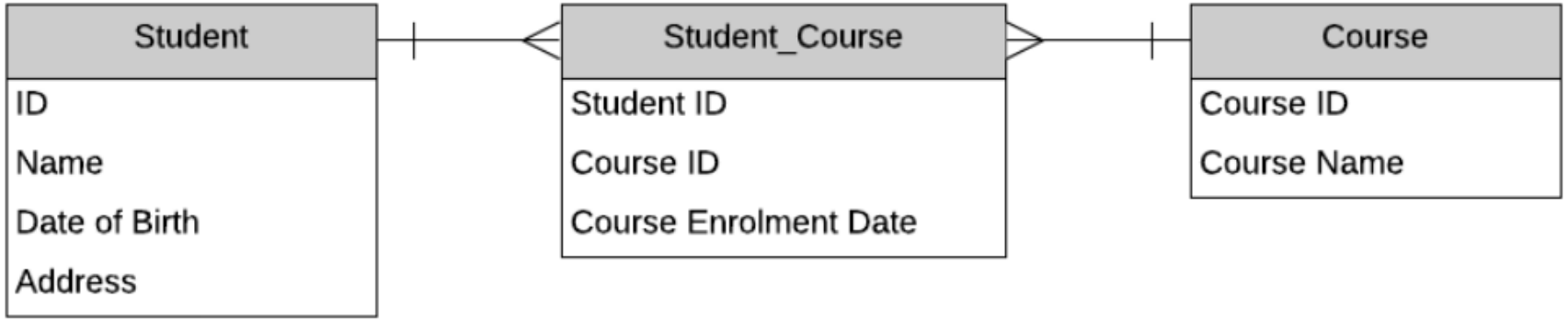
Entities represent objects or things of interest

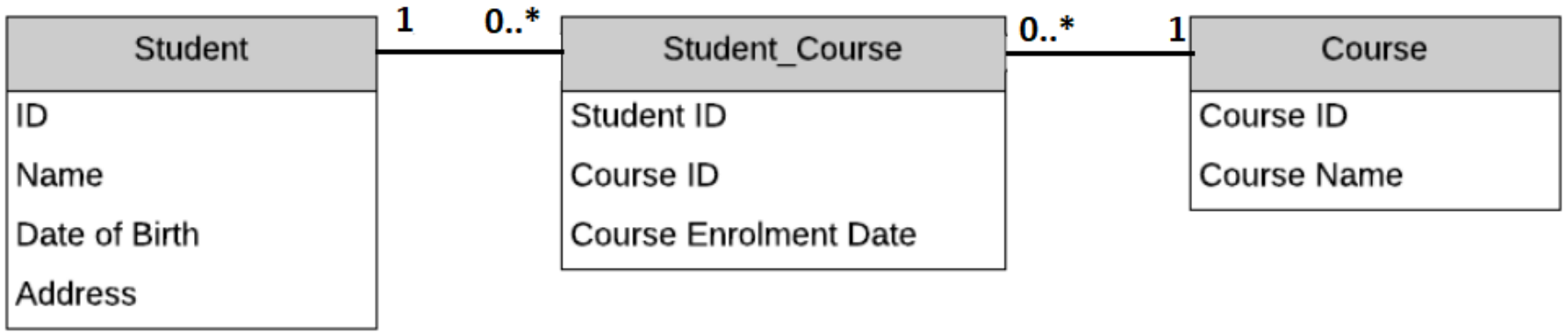
- Physical things like students, lecturers, employees, products
- More abstract things like modules, orders, courses, projects

Entities have

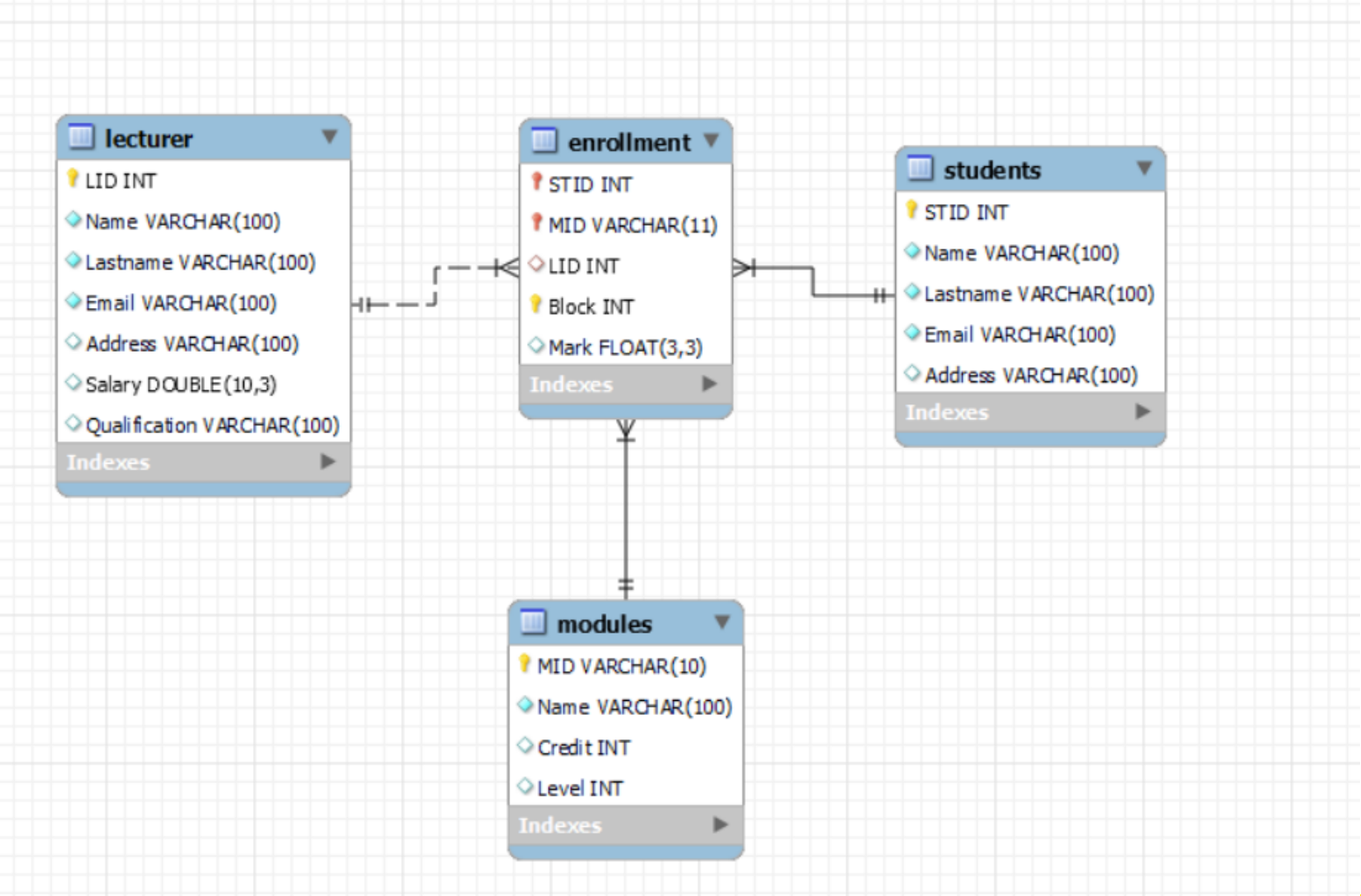
- A general type or class, such as Lecturer or Module
- Instances of that particular type, such as Reza Rafeh, Anne Smith are instances of Lecturer
- Attributes (such as name, email address)

ERD – Different Notations





Logical Design



SQL (Structured Query Language)

SQL is not a programming language, but rather a data sublanguage.

SQL is comprised of

- A data definition language (DDL)
  - Used to define database structures
- A data manipulation language (DML)
  - Data definition and updating
  - Data retrieval (Queries)

SQL for Data Definition

The SQL data definition statements include:

- CREATE
  - To create database objects
- ALTER
  - To modify the structure and/or characteristics of database objects
- DROP
  - To delete database objects
- TRUNCATE
  - To delete table data while keeping structure

SQL for Data Definition: CREATE

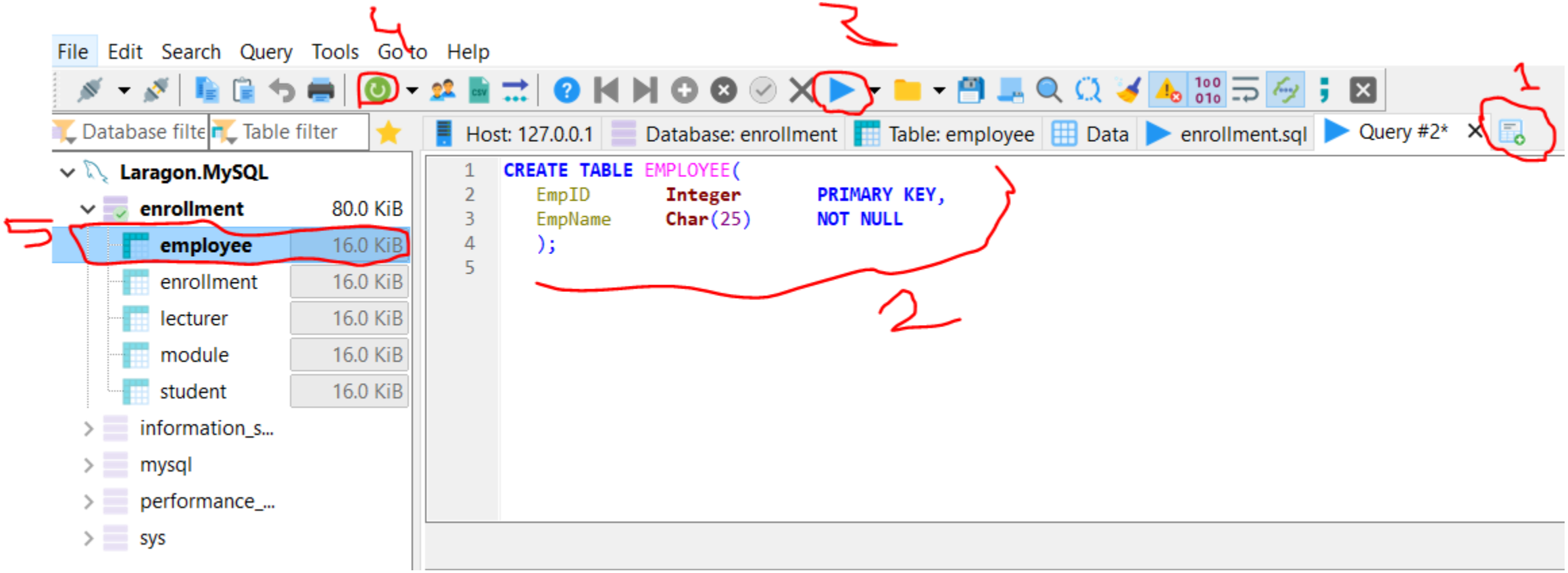
Creating database

```
CREATE DATABASE EMPLOYMENT;
```

Creating database tables

```
CREATE TABLE EMPLOYEE(
   EmpID        Integer          PRIMARY KEY,
   EmpName      Char(25)         NOT NULL
   );
```

Run SQL in MySQL



SQL for Data Definition: CREATE with CONSTRAINT

Creating database tables with PRIMARY KEY constraints

- The SQL CREATE TABLE statement
- The SQL CONSTRAINT keyword

```
CREATE TABLE EMPLOYEE(
   EmpID            Integer     NOT NULL,
   EmpName          Char(25)    NOT NULL
   CONSTRAINT  Emp_PK           PRIMARY KEY(EmpID)
   );
```

SQL for Data Definition:

Creating database tables with composite primary keys using PRIMARY KEY constraints

- The SQL CREATE TABLE statement
- The SQL CONSTRAINT keyword

```
CREATE TABLE EMP_SKILL(
    EmpID          Integer      NOT NULL,
    SkillID     Integer      NOT NULL,
    SkillLevel  Integer         NULL,
    CONSTRAINT  EmpSkill_PK  PRIMARY KEY
                                    (EmpID, SkillID)
    );
```

SQL for Data Definition:

Creating database tables using PRIMARY KEY and FOREIGN KEY constraints

- The SQL CREATE TABLE statement
- The SQL CONSTRAINT keyword

```
CREATE TABLE EMP_SKILL(
    EmpID        Integer      NOT NULL,
    SkillID      Integer      NOT NULL,
    SkillLevel   Integer         NULL,
    CONSTRAINT  EmpSkill_PK  PRIMARY KEY  (EmpID, SkillID),
   CONSTRAINT  Emp_FK    FOREIGN KEY(EmpID) REFERENCES   EMPLOYEE(EmpID),
   CONSTRAINT  Skill_FK         FOREIGN KEY(SkillID)  REFERENCES SKILL(SkillID)
);
```

Adding Data: INSERT

To add a row to an existing table, use the INSERT statement.

Non-numeric data must be enclosed in straight (') single quotes.

```
INSERT INTO EMPLOYEE VALUES(91, 'Smither', 12);
```

```
INSERT INTO EMPLOYEE (EmpID, SalaryCode)
   VALUES (62, 11);
```

SQL for Data Retrieval: Displaying All Columns

To show all of the column values for the rows that match the specified criteria, use an asterisk (*).

```
SELECT   *
FROM     EMPLOYEE;
```

SQL for Data Retrieval:
Showing Each Row Only Once

The DISTINCT keyword may be added to the SELECT statement to inhibit duplicate rows from displaying.

```
SELECT  DISTINCT DeptID

FROM    EMPLOYEE;
```

SQL for Data Retrieval:
Specifying Search Criteria

The WHERE clause stipulates the matching criteria for the record that is to be displayed.

```
SELECT      EmpName
FROM        EMPLOYEE
WHERE       DeptID = 15;
```

SQL for Data Retrieval: A List of Values

The WHERE clause may include the IN keyword to specify that a particular column value must be included in a list of values.

```
SELECT    EmpName
FROM      EMPLOYEE
WHERE     DeptID IN (4, 8, 9);
```

SQL for Data Retrieval: The Logical NOT Operator

Any criteria statement may be preceded by a NOT operator, which is to say that all information will be shown except that information matching the specified criteria

```
SELECT    EmpName
FROM      EMPLOYEE
WHERE     DeptID NOT IN (4, 8, 9);
```

SQL for Data Retrieval: Finding Data in a Range of Values

SQL provides a BETWEEN keyword that allows a user to specify a minimum and maximum value on one line.

```
SELECT   EmpName
FROM     EMPLOYEE
WHERE    SalaryCode BETWEEN 10 AND 45;
```

SQL for Data Retrieval: Allowing for Wildcard Searches

The SQL LIKE keyword allows searches on partial data values.

LIKE can be paired with wildcards to find rows matching a string value.

- Multiple character wildcard character is a percent sign (%).
- Single character wildcard character is an underscore (_).

SQL for Data Retrieval: Wildcard Search Examples

```
SELECT          EmpID
FROM        EMPLOYEE
WHERE       EmpName LIKE 'Wilk%';

SELECT      EmpID
FROM        EMPLOYEE
WHERE       Phone LIKE '07-___-____';
```

SQL for Data Retrieval: Sorting the Results

Query results may be sorted using the ORDER BY clause.

```
SELECT      *
FROM                EMPLOYEE
ORDER BY    EmpName;
```

SQL for Data Retrieval:
Built-in SQL Functions

SQL provides several built-in functions:

- COUNT : Counts the number of rows that match the specified criteria
- MIN: Finds the minimum value for a specific column for those rows matching the criteria
- MAX: Finds the maximum value for a specific column for those rows matching the criteria
- SUM: Calculates the sum for a specific column for those rows matching the criteria
- AVG: Calculates the numerical average of a specific column for those rows matching the criteria

SQL for Data Retrieval: Built-in Function Examples

```
SELECT COUNT(DeptID)
FROM       EMPLOYEE;


SELECT MIN(Hours) AS MinimumHours,
    MAX(Hours) AS MaximumHours,
    AVG(Hours) AS AverageHours
FROM       PROJECT
WHERE      ProjID > 7;
```

SQL for Data Retrieval:
Providing Subtotals: GROUP BY

Subtotals may be calculated by using the GROUP BY clause.

The HAVING clause may be used to restrict which data is displayed.

```
SELECT COUNT(CustomerID), Country

FROM Customers

GROUP BY Country;
```

COUNT(CustomerID)	Country
3	Argentina
2	Austria
2	Belgium

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
12	Cactus Comidas para llevar	Patricio Simpson	Cerrito 333	Buenos Aires	1010	Argentina
54	Océano Atlántico Ltda.	Yvonne Moncada	Ing. Gustavo Moncada 8585 Piso 20-A	Buenos Aires	1010	Argentina
64	Rancho grande	Sergio Gutiérrez	Av. del Libertador 900	Buenos Aires	1010	Argentina
20	Ernst Handel	Roland Mendel	Kirchgasse 6	Graz	8010	Austria
59	Piccolo und mehr	Georg Pipps	Geislweg 14	Salzburg	5020	Austria
50	Maison Dewey	Catherine Dewey	Rue Joseph-Bens 532	Bruxelles	B-1180	Belgium
76	Suprêmes délices	Pascale Cartrain	Boulevard Tirou, 255	Charleroi	B-6000	Belgium

SQL for Data Retrieval:
Retrieving Information from Multiple Tables

Subqueries

- As stated earlier, the result of a query is a relation. As a result, a query may feed another query. This is called a *subquery.*

Joins

- Another way of combining data is by using a *join* .
  - Join [also called an Inner Join]
  - Left Outer Join
  - Right Outer Join

SQL for Data Retrieval: Subquery Example

```
SELECT EmpName
FROM       EMPLOYEE
WHERE      DeptID in
     (SELECT  DeptID
     FROM     DEPARTMENT
              WHERE    DeptName LIKE 'Account%');
```

SQL for Data Retrieval: Join Example

```
SELECT   EmpName
FROM     EMPLOYEE AS E, DEPARTMENT AS D
WHERE    E.DeptID = D.DeptID
       AND  D.DeptName LIKE 'Account%';
```

Modifying Data using SQL

Insert

- Will add a new row in a table (already discussed above)

Update

- Will update the data in a table that matches the specified criteria

Delete

- Will delete the data in a table that matches the specified criteria

Modifying Data using SQL:
Changing Data Values: UPDATE

To change the data values in an existing row (or set of rows) use the Update statement.

```
UPDATE    EMPLOYEE
SET    Phone '791-555-1234'
WHERE     EmpID = 29;

UPDATE    EMPLOYEE
SET       DeptID = 44
WHERE     EmpName LIKE 'Kr%';
```

Modifying Data using SQL:
Deleting Data: DELETE

To delete a row or set of rows from a table use the DELETE statement.

```
DELETE FROM EMPLOYEE
WHERE  EmpID = 29;
```

```
DELETE FROM EMPLOYEE
WHERE  EmpName LIKE 'Kr%';
```

Modifying Data using SQL:
Deleting Database Objects: DROP

To remove unwanted database objects from the database, use the SQL DROP statement.

Warning… The DROP statement will permanently remove the object and all data.

```
DROP TABLE EMPLOYEE;
```

Modifying Data using SQL:
Removing a Constraint: ALTER & DROP

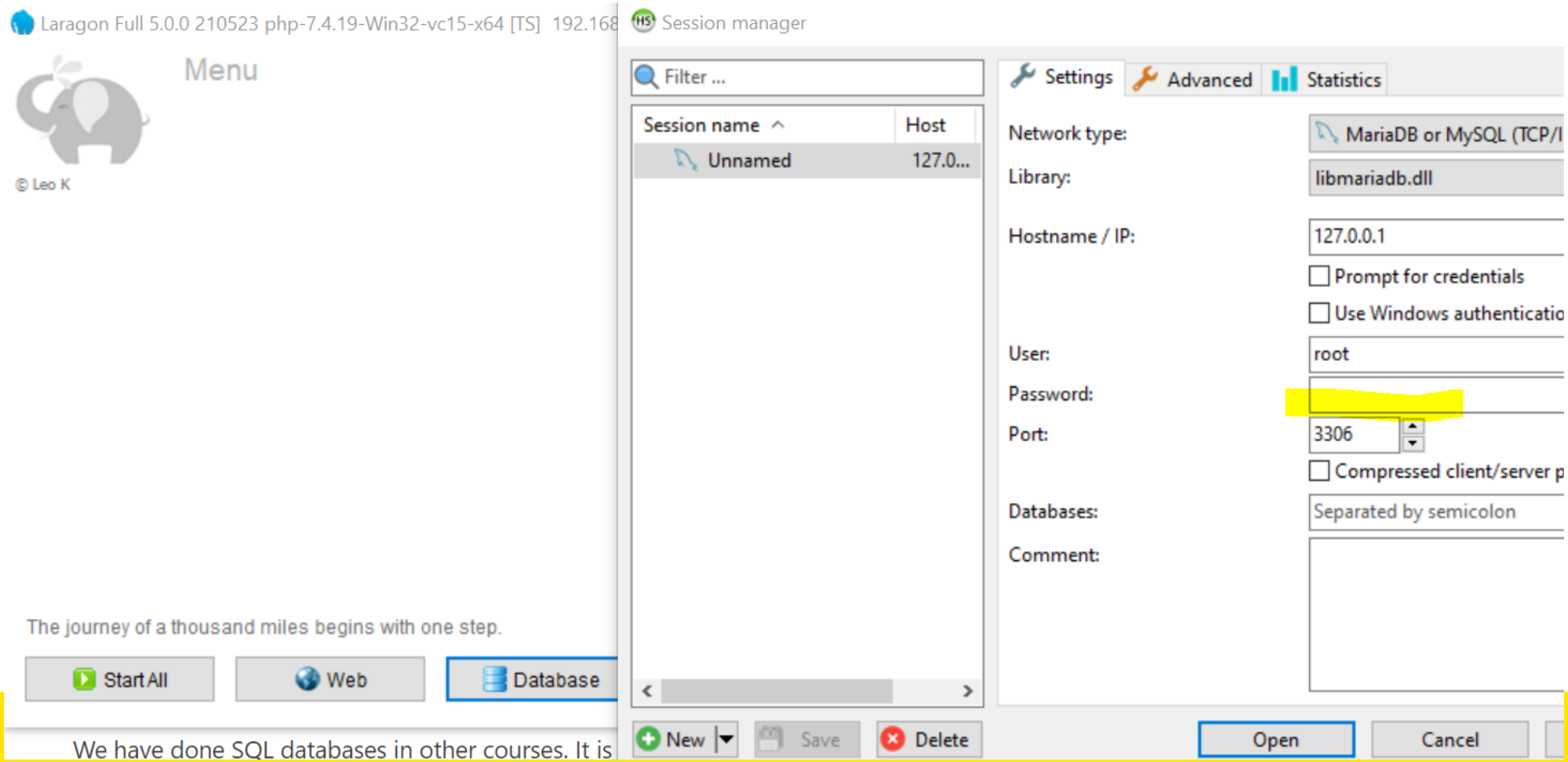
To change the constraints on existing tables, you may need to remove the existing constraints before adding new constraints.

```
ALTER TABLE EMPLOYEE DROP CONSTRAINT EmpFK;
```

MySQL Tutorial

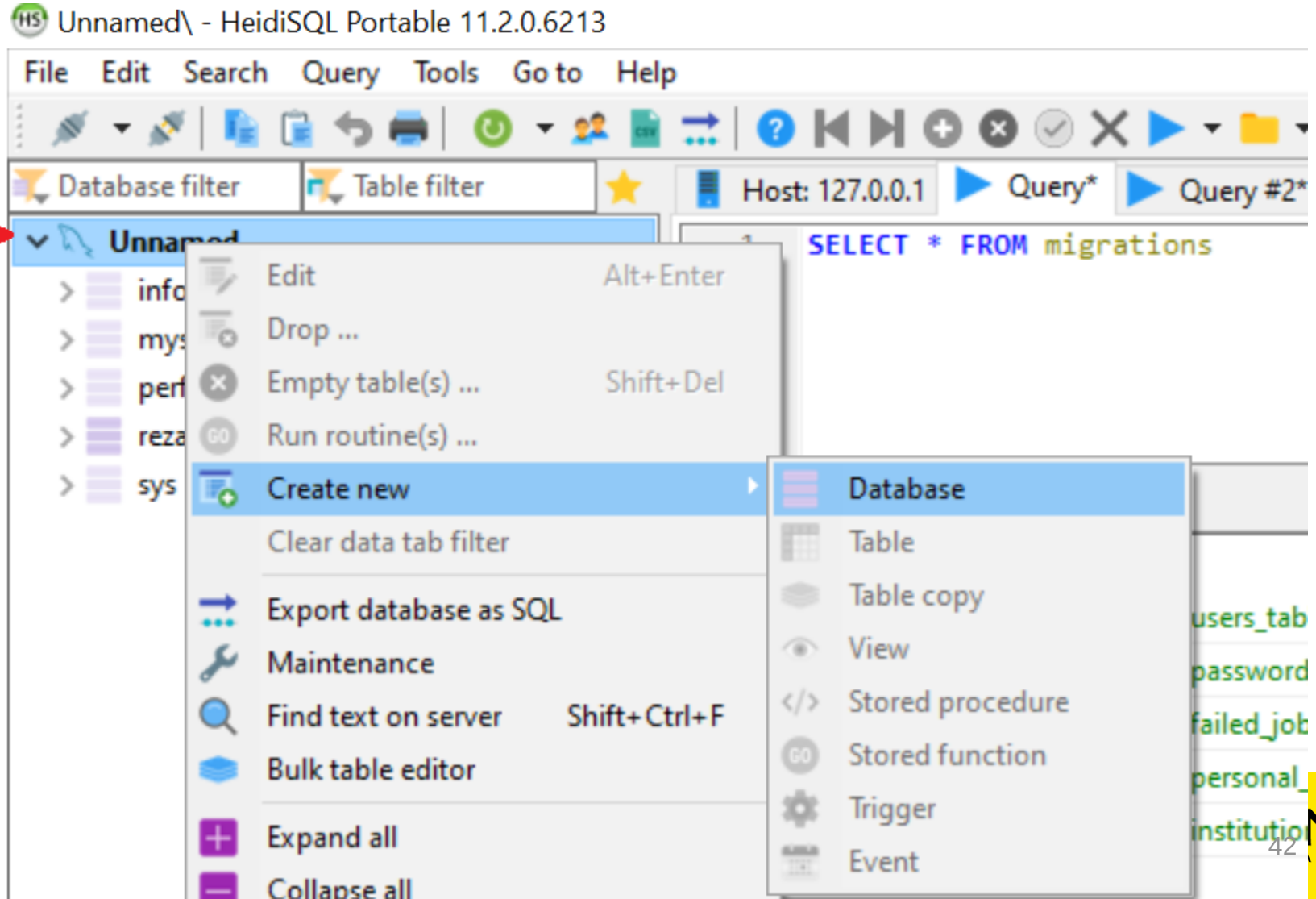
- MySQL is an open-source relational database management system (RDBMS).
- MySQL is based on SQL (Structured Query Language) which is a standard language for managing relational databases.
- It is one of the most popular database systems used by web applications.
- MySQL can be installed on various operating systems such as Windows, Linux, macOS, etc.
- MySQL offers high performance, scalability, and reliability.
- It provides a wide range of features including support for transactions, indexing, triggers, stored procedures, views, and more.

Start Laragon and Database
Type your password

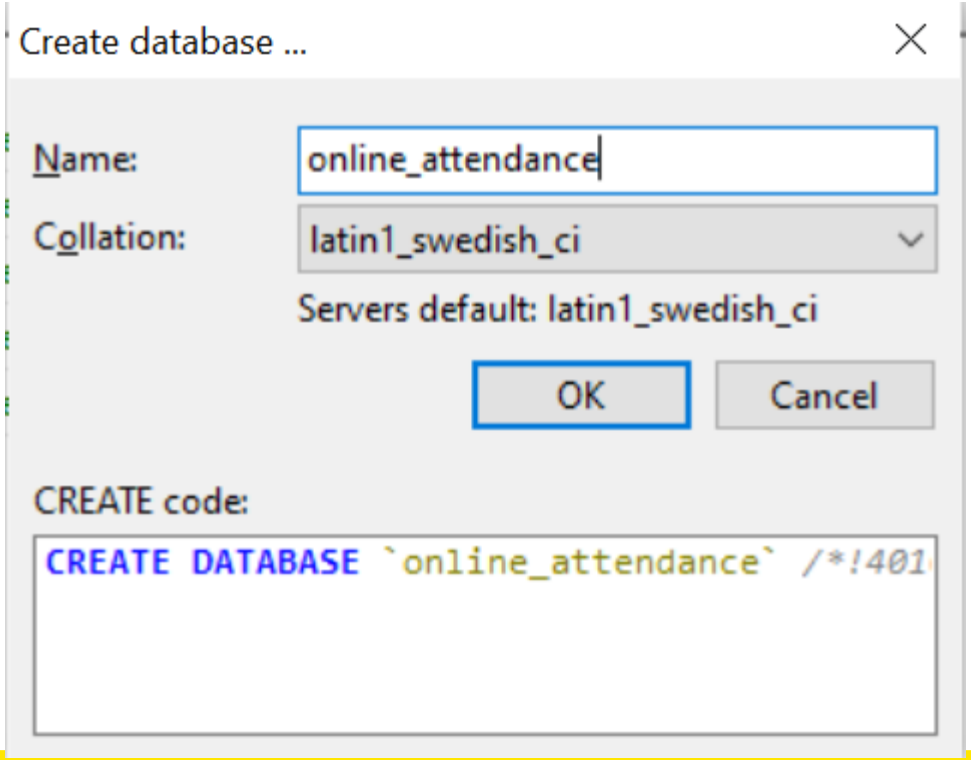


Create a Database

Right Click

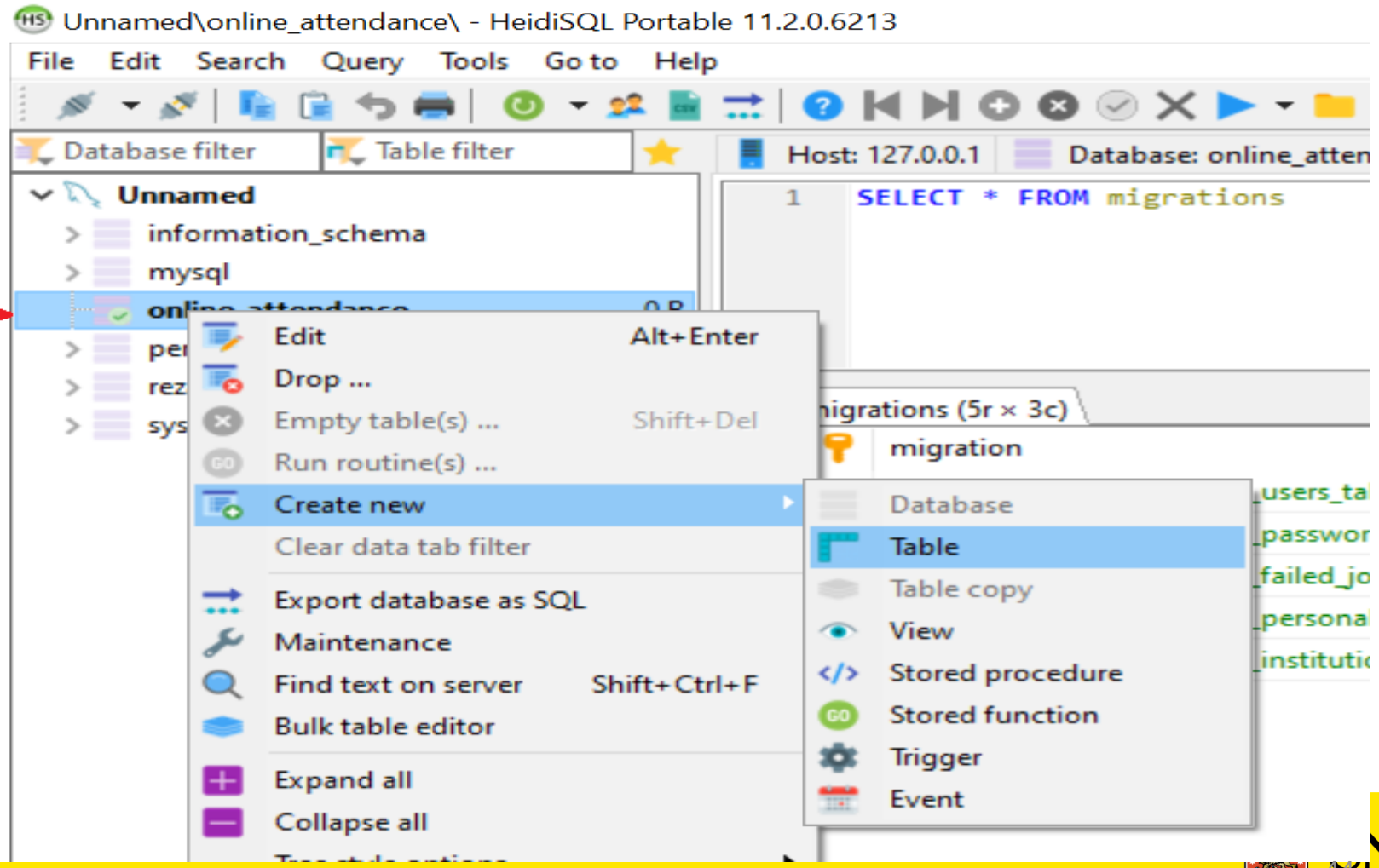


Choose a name for the database



Create a Table

Right Click



Add Columns to the Table

Basic | Options | Indexes (0) | Foreign keys (0) | Check constraints (0) | Partitions | CREATE code

Name: modules

Comment:

Add a new column

Columns: Add Remove Up Down

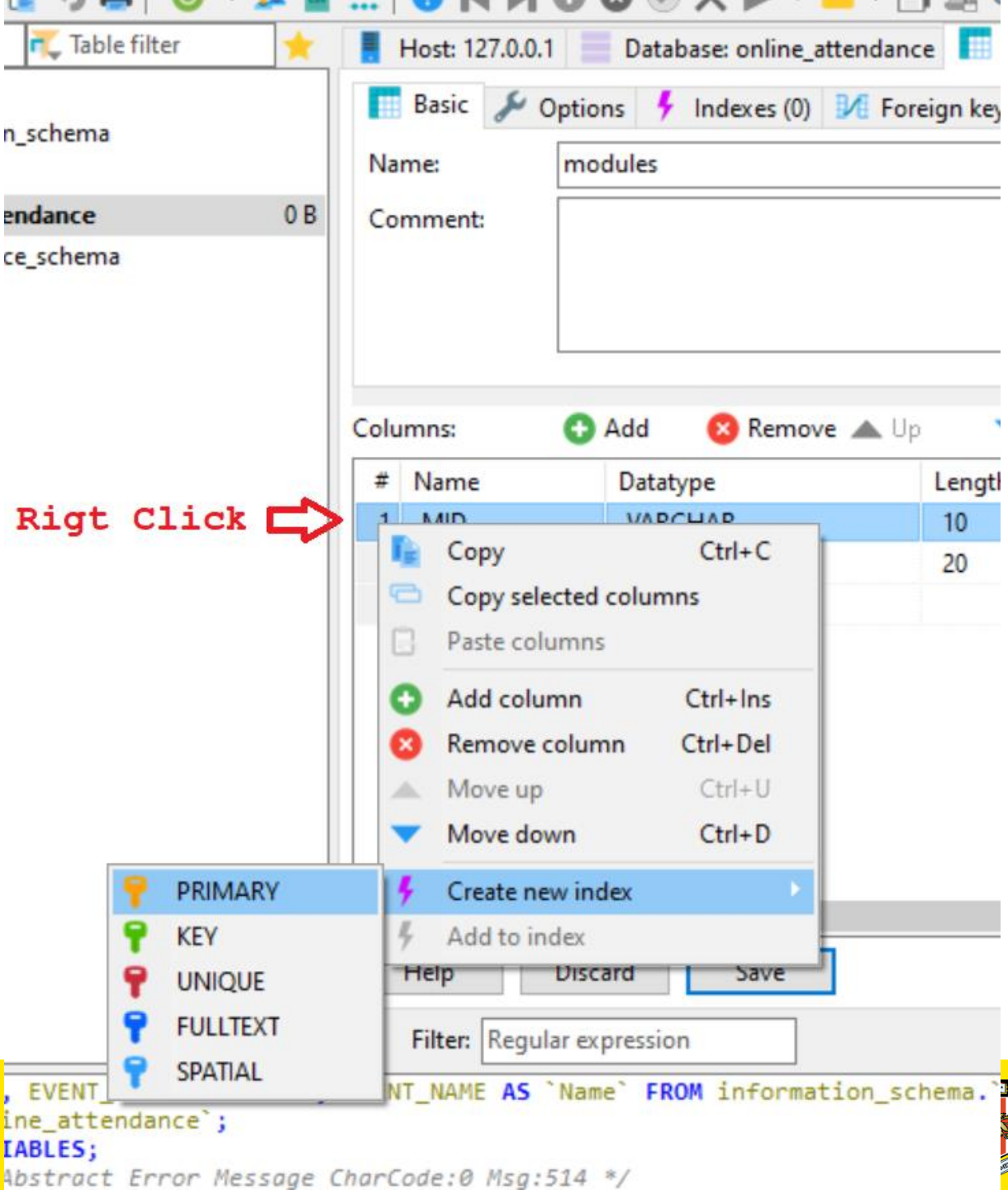
#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default	Commer
1	MID	VARCHAR	10	☐	☑	☐	NULL	
2	Name	VARCHAR	20	☐	☑	☐	NULL	
3	Credit	INT		☐	☑	☐	NULL	

Choose data type

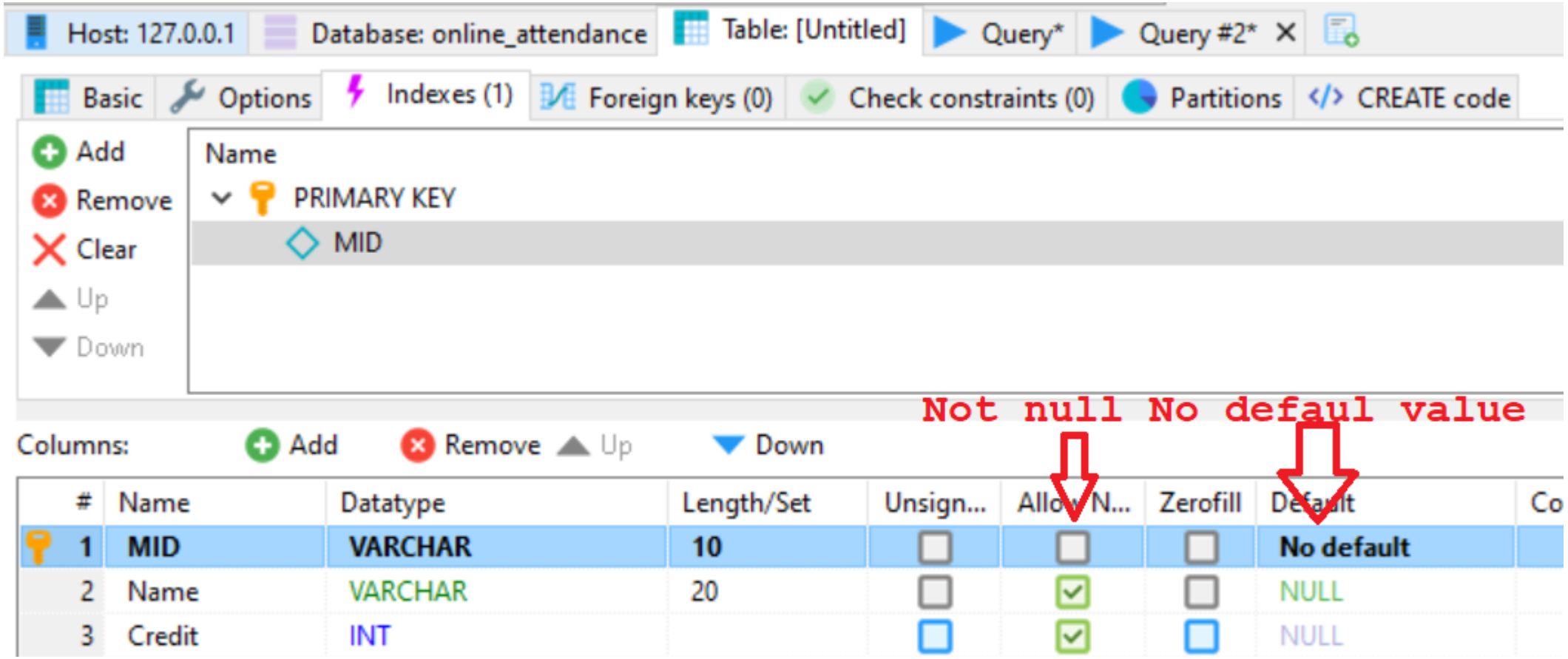
max length of values

45

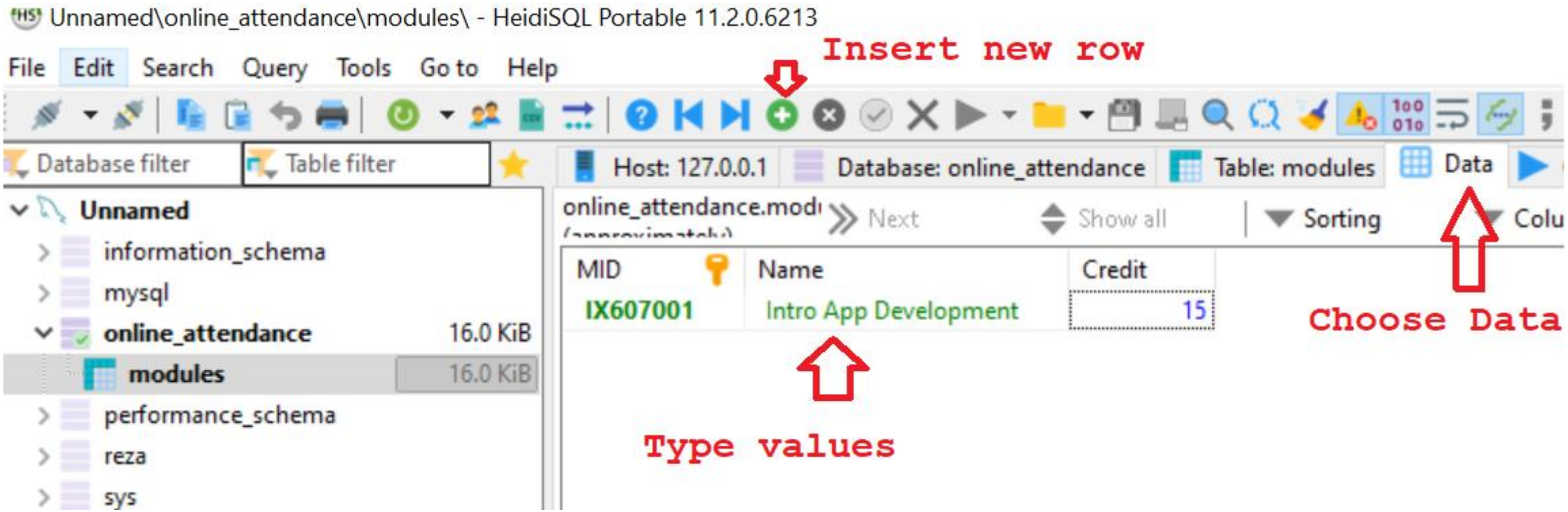
Create a Primary Key



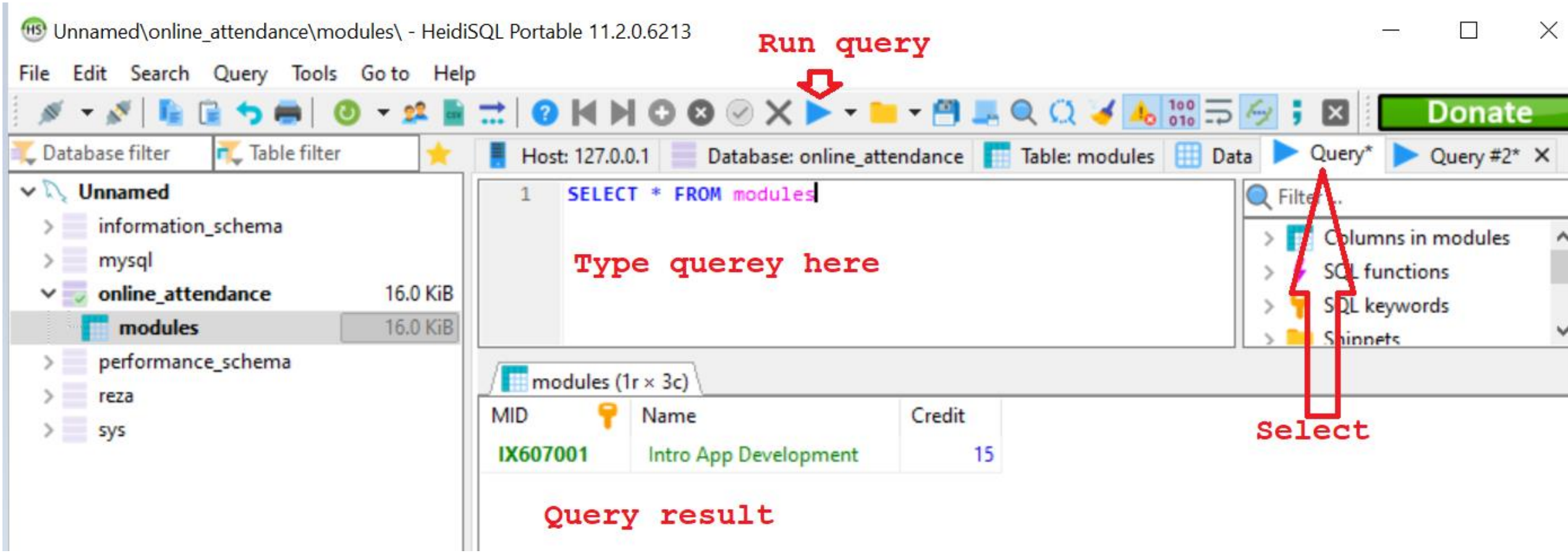
Primary Key


Host: 127.0.0.1
Database: online_attendance
Table: [Untitled]
Query*
Query #2*
Basic
Options
Indexes (1)
Foreign keys (0)
Check constraints (0)
Partitions
CREATE code
Add
Remove
Clear
Up
Down
Name
PRIMARY KEY
MID
Not null No defaul value
Columns:
Add
Remove
Up
Down
Name Datatype Length/Set Unsign... Allow N... Zerofill Default Co
1 MID VARCHAR 10 No default
2 Name VARCHAR 20 NULL
3 Credit INT NULL

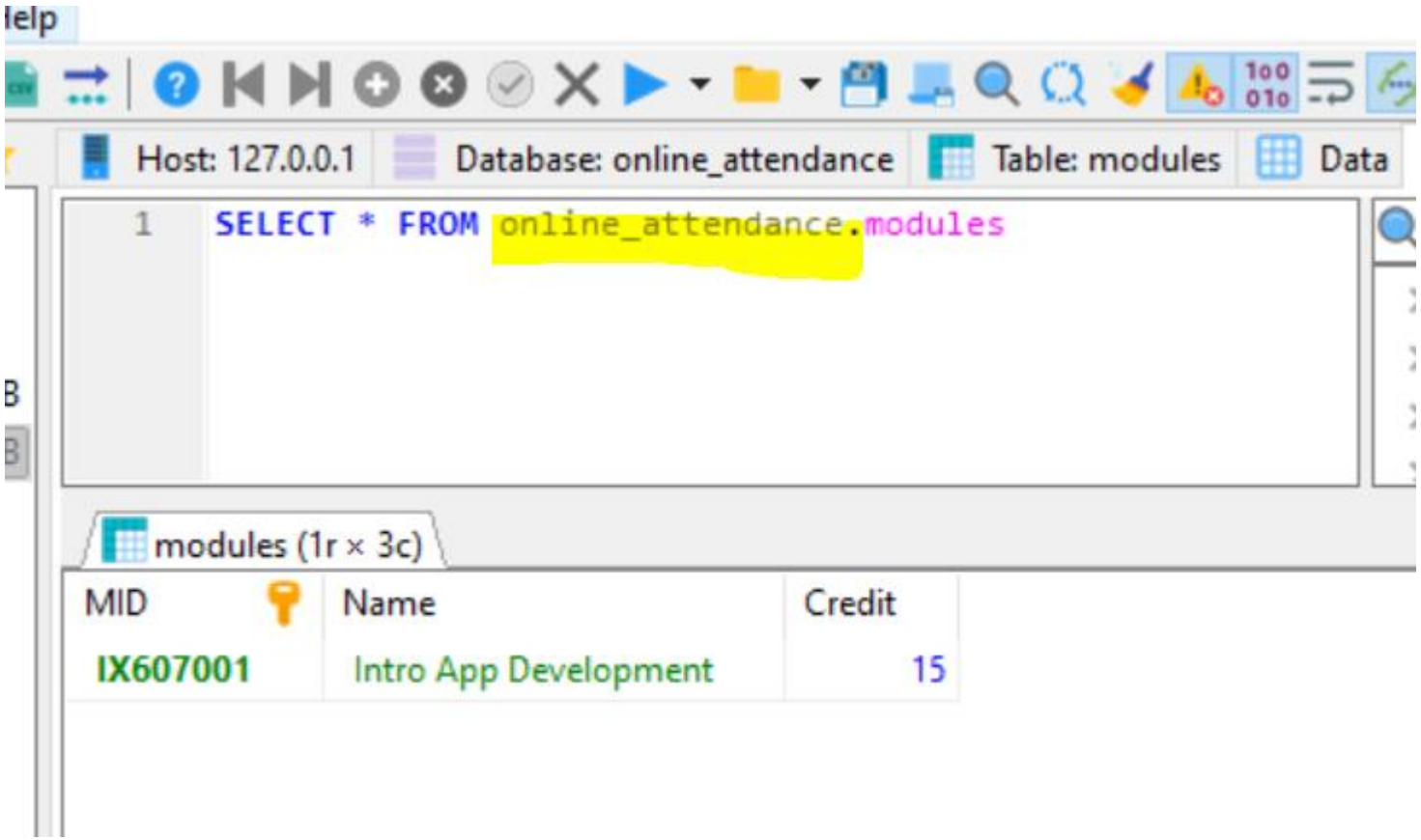
Add Rows to the Table



Run SQL Quesries



Referring to the Database Name in Queries



Insert Data Using SQL

Host: 127.0.0.1 | Database: online_attendance | Table: modules | Data

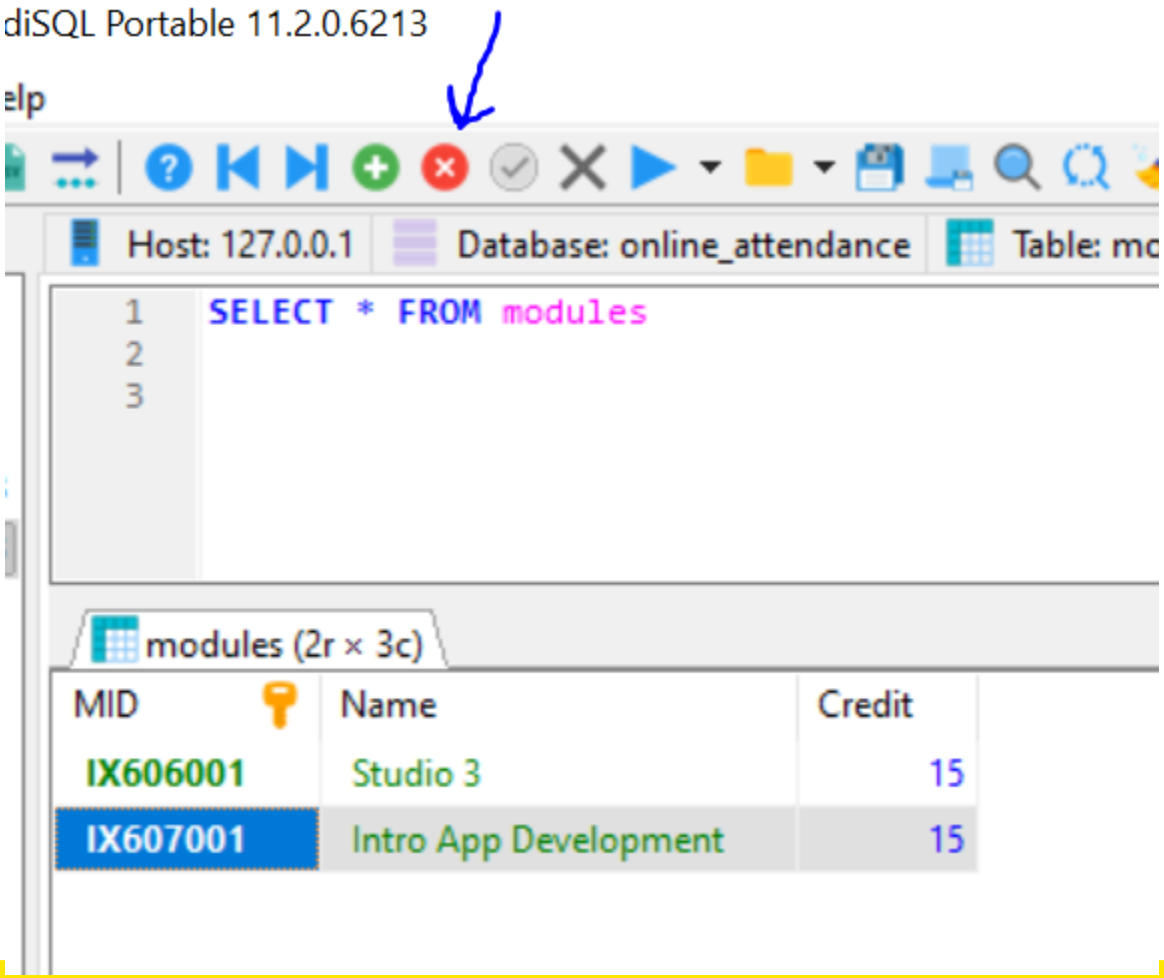
```sql
INSERT INTO online_attendance.modules VALUES
('IX606001', 'Studio 3', 15)
```

```sql
SELECT * FROM modules
```

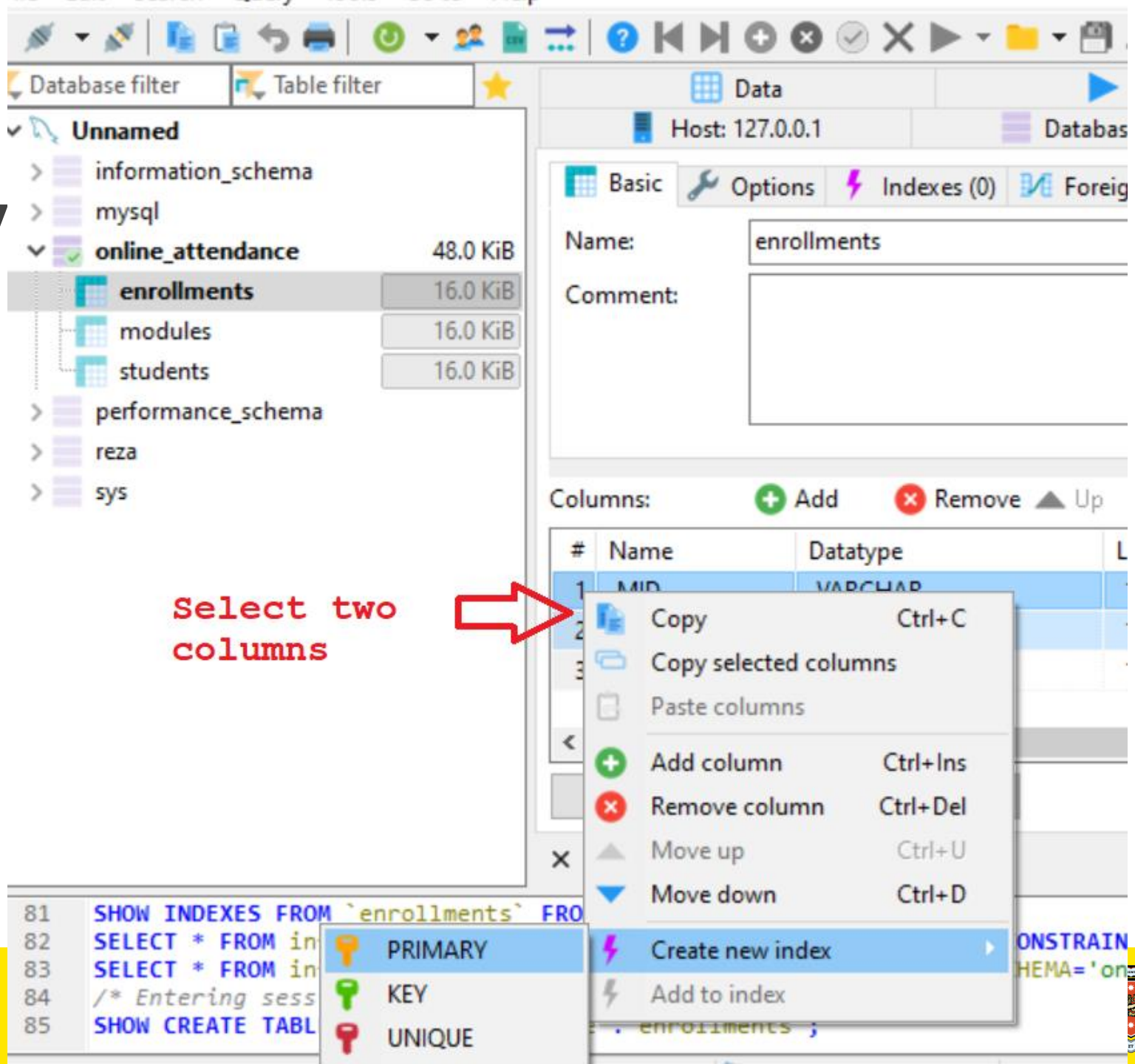
modules (2r × 3c)

MID	Name	Credit
IX606001	Studio 3	15
IX607001	Intro App Development	15

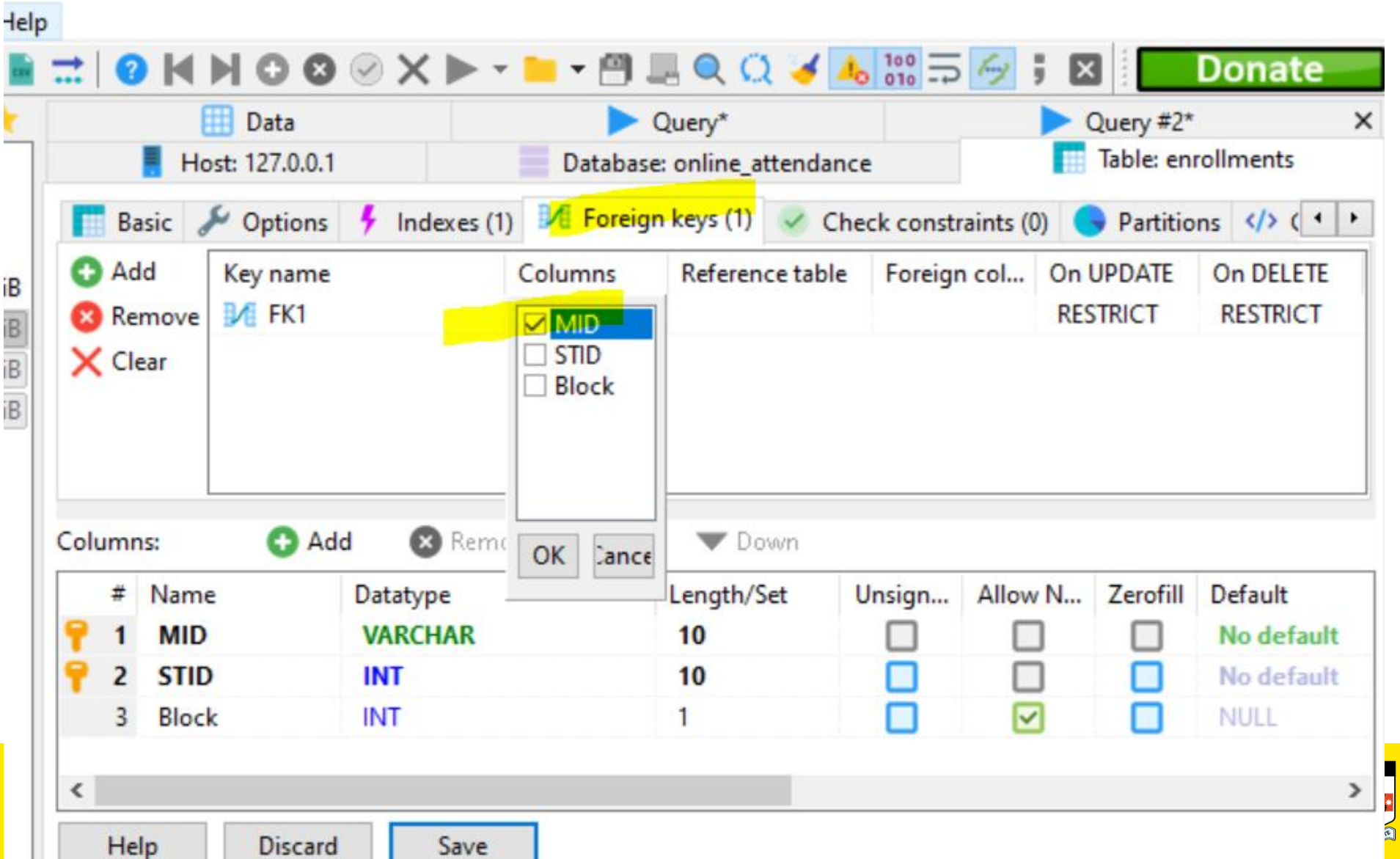
Delete a Row


diSQL Portable 11.2.0.6213
elp
Host: 127.0.0.1
Database: online_attendance
Table: mo
1 SELECT * FROM modules
2
3
modules (2r × 3c)
MID
Name
Credit
IX606001
Studio 3
15
IX607001
Intro App Development
15

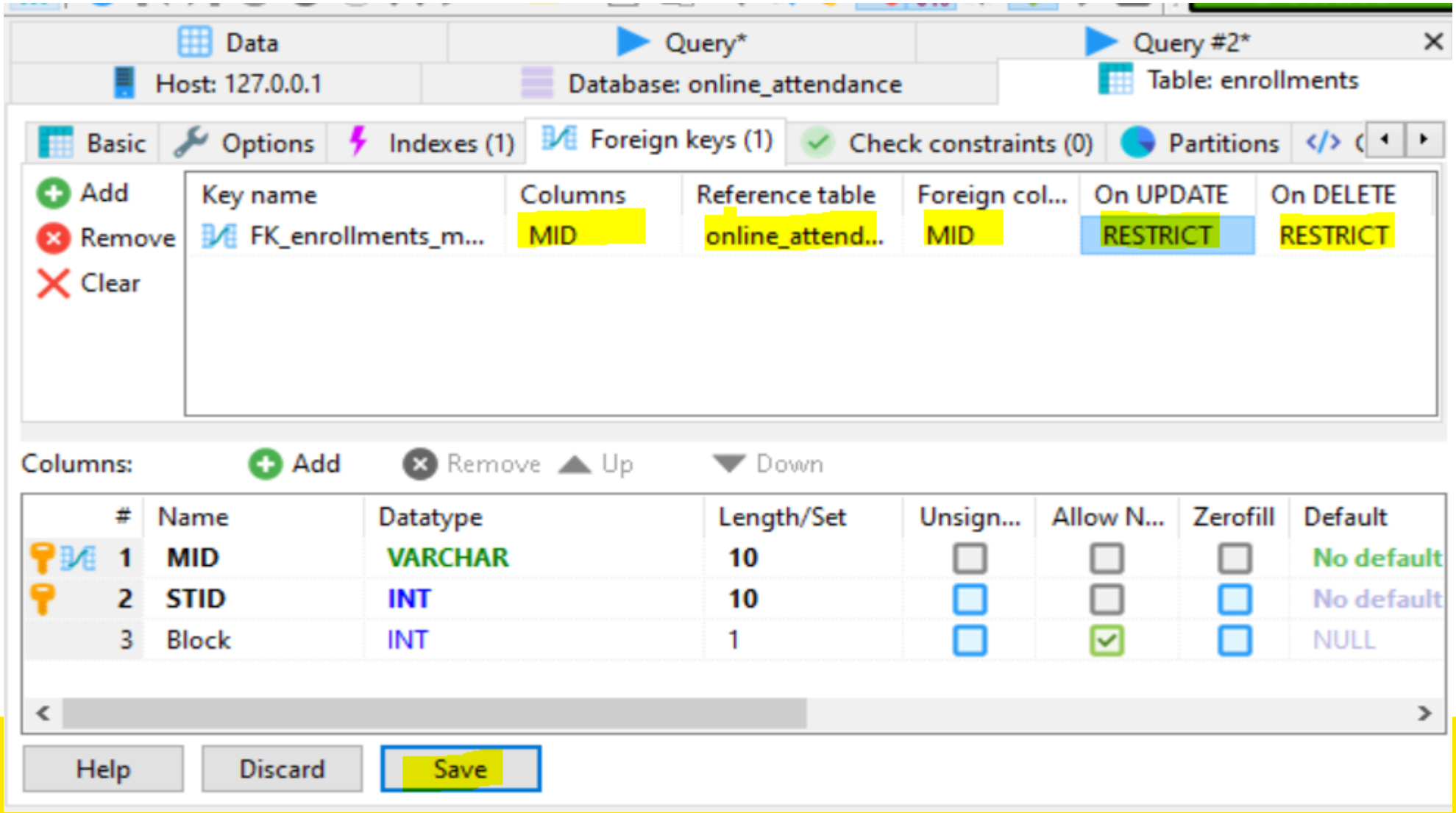
Compound Primary Key



Foreign Keys



Foreign Keys



Foreign Keys

Donate

Data | Query* | Query #2*

Host: 127.0.0.1 | Database: online_attendance | Table: enrollments

Basic | Options | Indexes (1) | Foreign keys (2) | Check constraints (0) | Partitions

Add
Remove
Clear

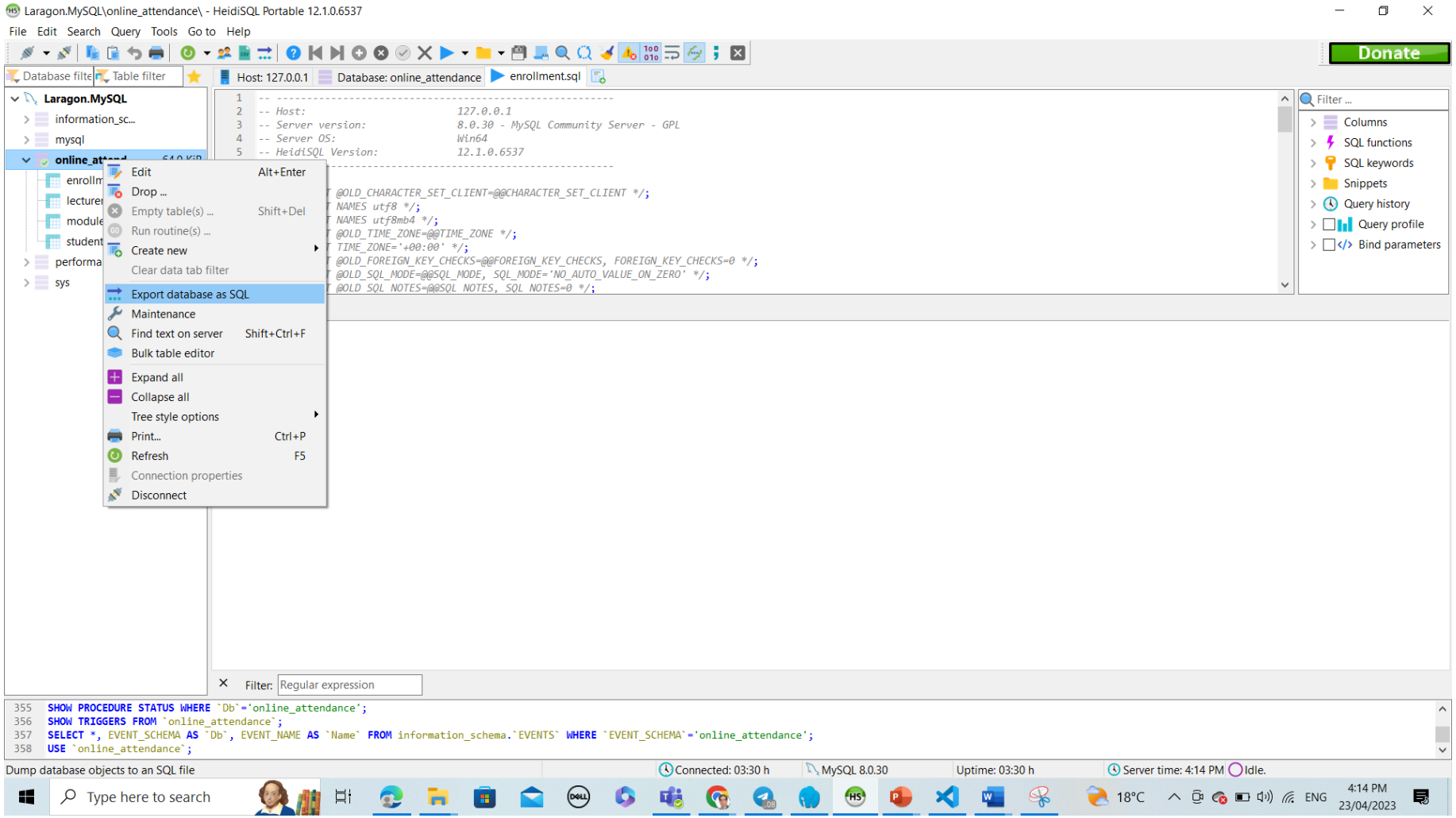
Key name	Columns	Reference table	Foreign col...	On UPDATE	On DELETE
FK_enrollments_m...	MID	online_attend...	MID	RESTRICT	RESTRICT
FK_enrollments_stu...	STID	students	STID	RESTRICT	RESTRICT

Columns: Add Remove Up Down

#	Name	Datatype	Length/Set	Unsign...	Allow N...	Zerofill	Default
1	MID	VARCHAR	10				No default
2	STID	INT	10				No default
3	Block	INT	1		✓		NULL

Help | Discard | Save

Export SQL Scripts



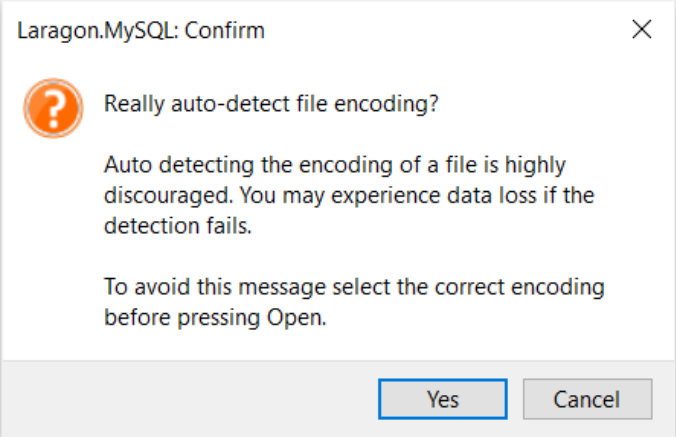
SQL Script

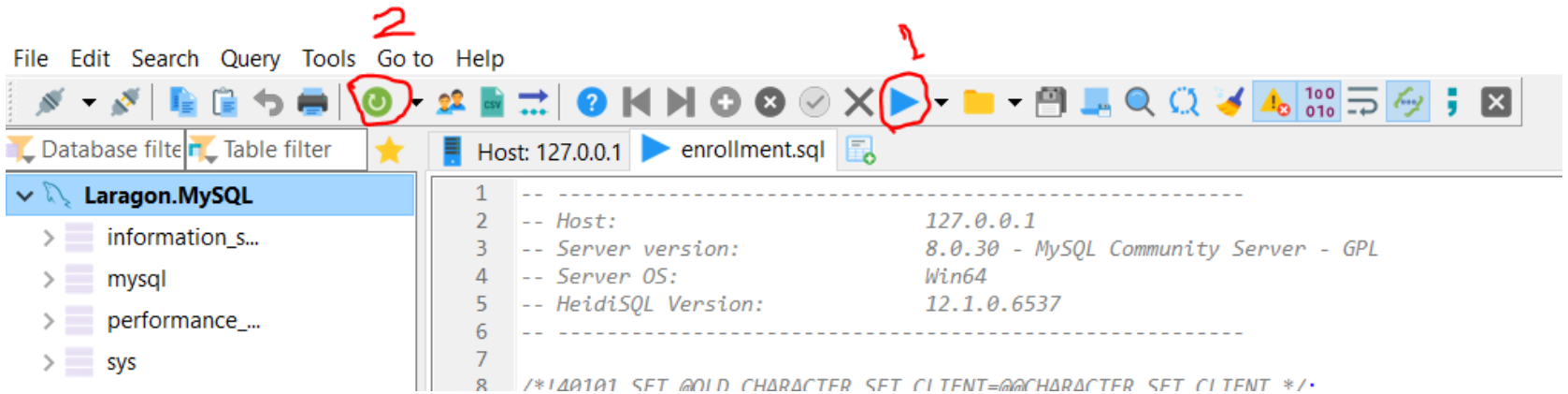
enrollment.sql

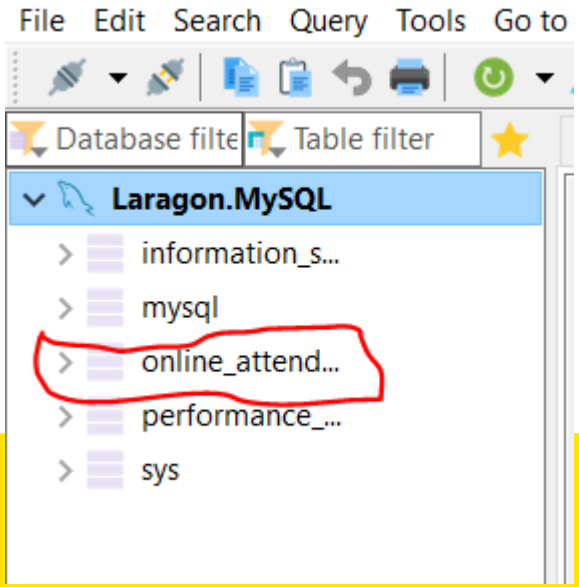
```sql
-- --------------------------------------------------------
-- Host:                         127.0.0.1
-- Server version:               8.0.30 - MySQL Community Server - GPL
-- Server OS:                    Win64
-- HeidiSQL Version:             12.1.0.6537
-- --------------------------------------------------------

/*!40101 SET @OLD_CHARACTER_SET_CLIENT=@@CHARACTER_SET_CLIENT */;
/*!40101 SET NAMES utf8 */;
/*!50503 SET NAMES utf8mb4 */;
/*!40103 SET @OLD_TIME_ZONE=@@TIME_ZONE */;
/*!40103 SET TIME_ZONE='+00:00' */;
/*!40014 SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0 */;
/*!40101 SET @OLD_SQL_MODE=@@SQL_MODE, SQL_MODE='NO_AUTO_VALUE_ON_ZERO' */;
/*!40111 SET @OLD_SQL_NOTES=@@SQL_NOTES, SQL_NOTES=0 */;


-- Dumping database structure for enrollment
DROP DATABASE IF EXISTS `enrollment`;
CREATE DATABASE IF NOT EXISTS `enrollment` /*!40100 DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci */ /*!80
USE `enrollment`;

-- Dumping structure for table enrollment.enrollment
DROP TABLE IF EXISTS `enrollment`;
CREATE TABLE IF NOT EXISTS `enrollment` (
  `STID` int NOT NULL,
  `MID` varchar(11) NOT NULL,
  `LID` int DEFAULT NULL,
  `Block` int NOT NULL,
  `Mark` float(3,3) DEFAULT NULL,
  PRIMARY KEY (`STID`,`MID`,`Block`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

-- Dumping data for table enrollment.enrollment: ~2 rows (approximately)
REPLACE INTO `enrollment` (`STID`, `MID`, `LID`, `Block`, `Mark`) VALUES
  (192833, 'IX606001', 200, 5, NULL),
  (192833, 'IX607001', 100, 5, NULL);
```

Importing SQL Scripts

File -> Load SQL File







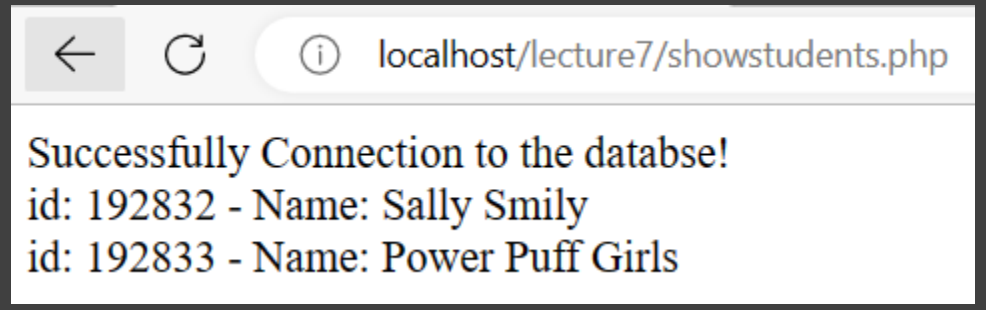
PHP – Connect to Database

```php
<?php
//connectDB.php
$servername = "localhost";
$username = "root";
$password = ""; //Your password here
$dbname = "online_attendance";
?>
```

```php
<?php
//testDB.php
require_once 'connectDB.php';
// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error)
    die("Connection failed: " . $conn->connect_error);
else
    echo "Successfully Connection to the database!";
$conn->close();
?>
```

PHP – Querying the Database

```php
<?php
require_once 'connectDB.php';
$conn = new mysqli($servername, $username, $password, $dbname);
if ($conn->connect_error)
  die("Connection failed: " . $conn->connect_error);
else
  echo "Successfully Connection to the database!". "<br>";
$sql = "SELECT * FROM students";
$result = $conn->query($sql);
if ($result->num_rows > 0) {
  while($row = $result->fetch_assoc()) {
    echo "id: " . $row["STID"]. " - Name: " . $row["Name"]. " " . $row["Lastname"]. "<br>";
  }
} else {
  echo "0 results";
}
$conn->close();
?>
```



PHP – Querying Data - HTML Output

```
$sql = "SELECT * FROM students" ;
$stmt = $conn->prepare($sql);
$stmt->execute();
$result = $stmt->get_result();
  if ($result->num_rows > 0) {
  ?>
  <table >
      <thead>
        <tr>
          <th> ID </th>
          <th>First Name</th>
          <th>Last Name</th>
          <th>Email </th>
        </tr>
      </thead>
      <tbody>
      <?php
    // output data of each row
```

```
  while($row = $result->fetch_assoc()) {?>
  <tr>
        <td><?php echo $row["STID"]; ?></td>
        <td><?php echo $row["Name"]; ?></td>
        <td><?php echo $row["Lastname"]; ?></td>
        <td><?php echo $row["Email"]; ?></td>
      </tr>
   <?php
  }
} else {
  echo "0 results";
}
```

localhost/lecture7/showstudentsUI.php

Successfully Connection to the database!

ID	First Name	Last Name	Email
192832	Sally	Smily	Sallysmily@gmail.com
192833	Power Puff	Girls	powerpuffgirls@gmail.com

PHP – Insert Data

```php
$sql = "INSERT INTO students (STID, Name, Lastname, Email)
  VALUES (192332,'John', 'Doe', 'john@example.com')";

  if ($conn->query($sql) === TRUE) {
    echo "New record created successfully";
  } else {
    echo "Error: " . $sql . "<br>" . $conn->error;
  }
```

localhost/lecture7/addstudent.php

Successfully Connection to the databse!
New record created successfully

File Edit Search Query Tools Go to Help

Database filte | Table filter | Host: 127.0.0.1 | Database: online_attendance | Table: students | Data | enrollmen

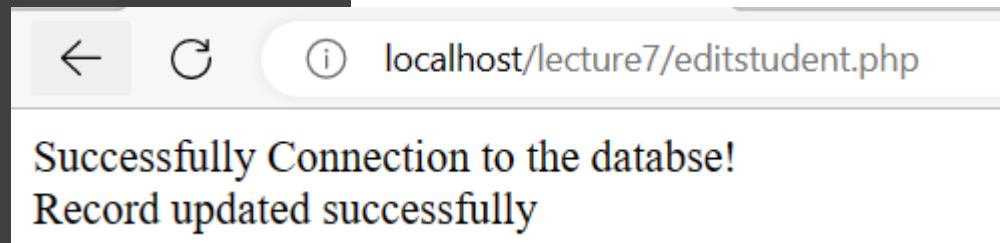
- Laragon.MySQL
  - information_s...
  - mysql
  - online_atten... 64.0 KiB
    - enrollment 16.0 KiB
    - lecturer 16.0 KiB
    - module 16.0 KiB
    - students 16.0 KiB

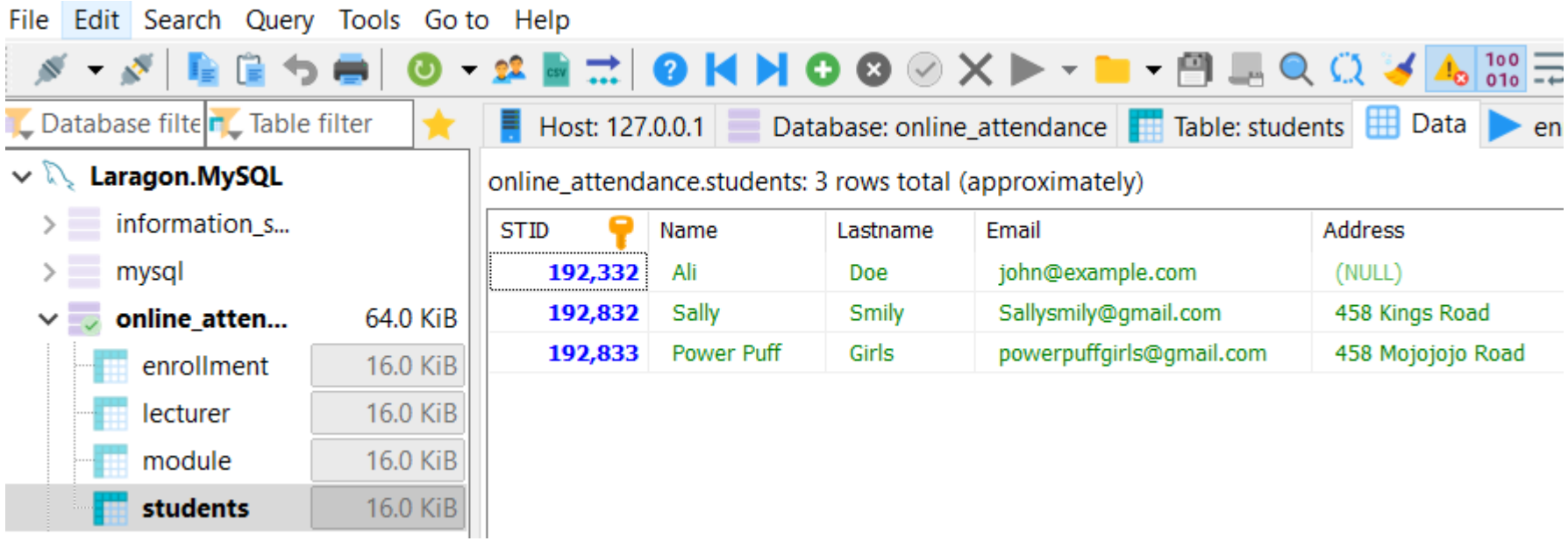
online_attendance.students: 3 rows total (approximately)

STID	Name	Lastname	Email	Address
192,332	John	Doe	john@example.com	(NULL)
192,832	Sally	Smily	Sallysmily@gmail.com	458 Kings Road
192,833	Power Puff	Girls	powerpuffgirls@gmail.com	458 Mojojojo Road

PHP – Edit Data

```
$sql = "UPDATE students SET Name = 'Ali' WHERE STID=192332";
  if ($conn->query($sql) === TRUE) {
    echo "Record updated successfully";
  } else {
    echo "Error updating record: " . $conn->error;
  }
```





PHP – Delete Data

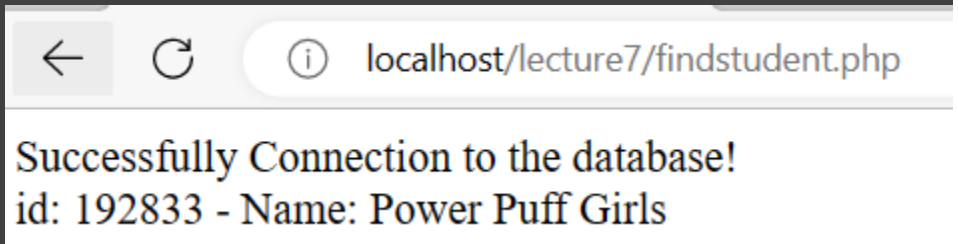
```
$sql = "DELETE FROM students WHERE STID=192332";
  if ($conn->query($sql) === TRUE) {
    echo "Record deleted successfully";
  } else {
    echo "Error deleting record: " . $conn->error;
  }
```

PHP – Create a Table

```
$sql = "CREATE TABLE enrollments_new (
    STID INT NOT NULL,
    MID VARCHAR(10) NOT NULL,
    Block INT,
    PRIMARY KEY (STID,MID),
    FOREIGN KEY (STID) REFERENCES students(STID),
    FOREIGN KEY (MID)  REFERENCES modules(MID)
)";
  $conn->query($sql);
  echo "Database and table users created successfully.";
```

PHP – Passing Parameter to SQL

```
$id = 192833;
  $sql = "SELECT * FROM students WHERE STID=?"; // SQL with parameters
  $stmt = $conn->prepare($sql);
  $stmt->bind_param("i", $id);
  $stmt->execute();
  $result = $stmt->get_result();

    if ($result->num_rows > 0) {
      // output data of each row
      while($row = $result->fetch_assoc()) {
        echo "id: " . $row["STID"]. " - Name: " . $row["Name"]. " " . $row["Lastname"]. "<br>";
      }
    } else {
      echo "0 results";
    }
```



? in the SQL query shows a parameter which must be set by using bind_param method. The fist argument is a string which shows the data type:

- i for integer
- d for double (float)
- s for string
- b for blob

In this example, since the student ID is an integer, we used i.

PHP – Passing Parameter to SQL – Cont.

```
$id = 1923443;
$name= "Jack";
$sql = "SELECT * FROM students WHERE STID=? and Name=?"; // SQL with parameters
$stmt = $conn->prepare($sql);
$stmt->bind_param("is", $id, $name);
$stmt->execute();
$result = $stmt->get_result();
  if ($result->num_rows > 0) {
    // output data of each row
    while($row = $result->fetch_assoc()) {
      echo "id: " . $row["STID"]. " - Name: " . $row["Name"]. " " . $row["Lastname"]. "<br>";
    }
  } else {
    echo "0 results";
  }
```

The number of parameters in bind_param must match with ? in SQL query (two here). The first parameter, “is”, shows the first parameter is an integer (id) and the second one is a string (name).

Passing Form Variables to SQL

```html
<html>
<body>

<form action="addStudentFromForm.php"
method="post">
    Student ID: <input type="text"
name="STID"><br>
    Name: <input type="text" name="name"><br>
    Last name: <input type="text"
name="lname"><br>
    E-mail: <input type="text" name="email"><br>
    Address: <input type="text"
name="address"><br>
    <input type="submit">
</form>

</body>
</html>
```

If you add the following statement to the end of addstudentfromform.php, you will be forwarded to studentform.php

```
header("Location:studentform.php");
```

```php
<?php
// addStudentFromform.php
require_once 'connectDB.php';
$id =  $_POST["STID"];
$name = $_POST["name"];
$lname = $_POST["lname"];
$email = $_POST["email"];
$address = $_POST["address"];

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error)
  die("Connection failed: " . $conn->connect_error);
$sql = "INSERT INTO students (STID, Name, Lastname, Email, Addre
  VALUES (?,?, ?, ?, ? )";
if ($stmt = $conn->prepare($sql))
    $stmt->bind_param("issss", $id, $name, $lname, $email, $addr
else
    {
        $error = $conn->errno . ' ' . $conn->error;
        echo $error;
    }
$stmt->execute();
echo "Student has been successfully added!";
$conn->close();
?>
```

Using PHP Variables in JS Code

```
$sql = "SELECT * FROM students";
$result = $conn->query($sql);
$i = 0;
if ($result->num_rows > 0) {
    while($row = $result->fetch_assoc()) {
     $rows[$i] = $row;
     $i++;
       }
  } else {
    echo "0 results";
  }
  $conn->close();
?>
<HTML>
<script>
  var result = <?php echo json_encode($rows); ?>;
  for(i=0; i < result.length; i++)
    alert(result[i]["STID"]+" "+result[i]["Name"]+" "+result[i]["Lastname"]+" "+result[i]["Email"]+"
"+result[i]["Address"]);
</Script>
</HTML>
```

JS Variable

PHP Variable

Connecting Backend to Frontend

Demo – Student List

Final Note

- **Only one lab this week:** Wednesday 26th April.
- **Marks for Project 1 have been released.**
  - Please check Moodle.
  - Let us know if you have any question about the feedback or marks.
- **Project 2 assessment is now open.**
  - Task Description is now available on Moodle under: Assessment Hub → Project 2.
- **Please do not forget Quiz 2 is next week:**
  - Quiz will be during your scheduled lab time.
  - Quiz is closed book.
  - Quiz duration is 40 minutes.
  - Quiz will cover material discussed in weeks 4, 5, and 6.