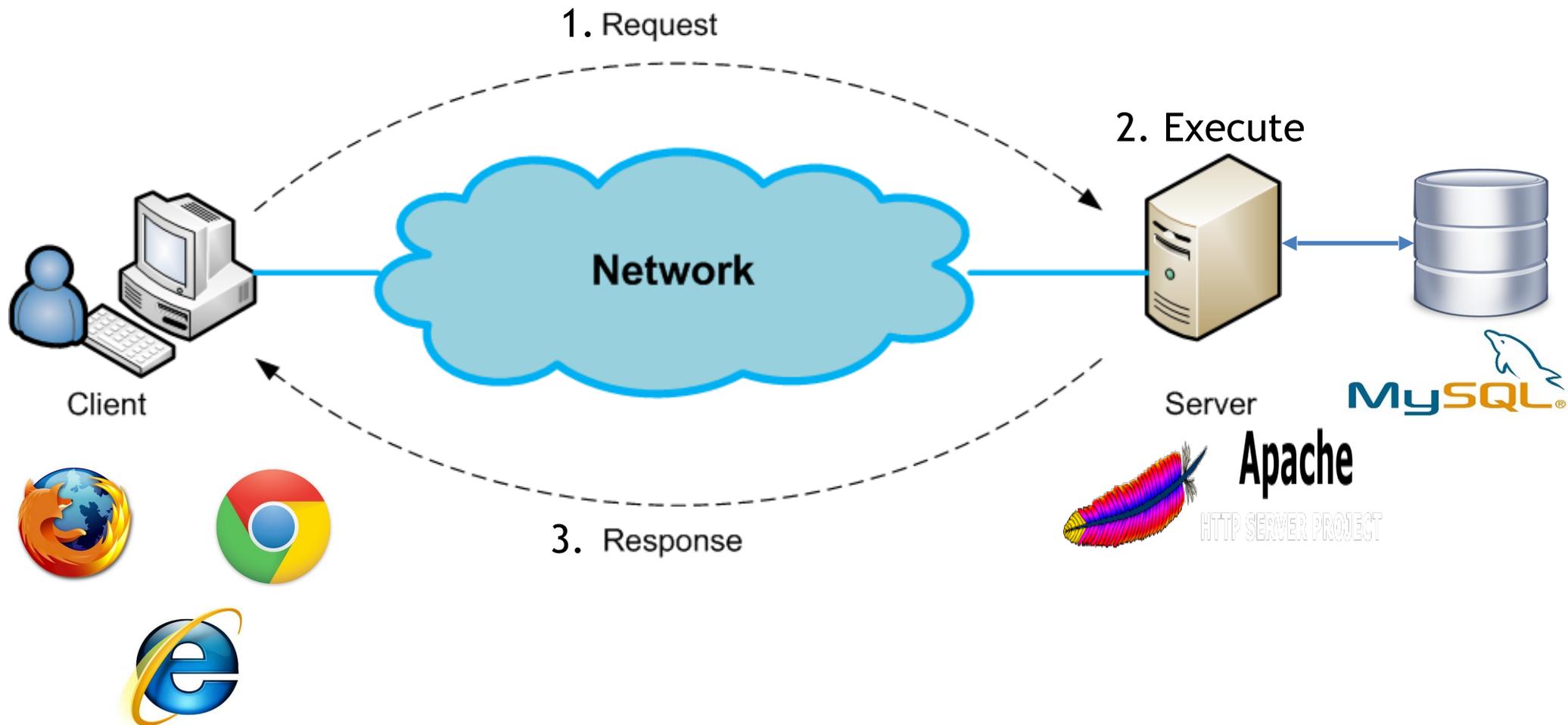


Web Application Development

PHP-MySQL

Web Client - Server



Why care about Database System?

- A database system is used to **store and manage** web contents
- Popular database systems: MySQL, Microsoft SQL, PostgreSQL, Oracle, DB2, etc.
- **MySQL** is currently the most popular DB system for websites. MySQL is used by Facebook, Twitter and Wikipedia, etc.

Connecting PHP and MySQL

- There are two main methods to connect PHP and MySQL:
 - MySQLi extension: object-oriented or procedural
 - PDO (PHP Data objects)
- Both MySQLi and PDO are automatically installed in one of the four PHP development environments (XAMPP, WAMP, MAMP, LAMP)
- MySQLi and PDO can also be manually installed:
 - <http://php.net/manual/en/mysqli.installation.php>
 - <http://php.net/manual/en/pdo.installation.php>

Accessing MySQL using PHP

- **The 7-step process:**
 1. Connect to MySQL
 2. Select the database to use
 3. Build a query string
 4. Perform the query
 5. Retrieve the results and process
 6. Repeat Steps 3 to 5 until all desired data have been retrieved
 7. Disconnect from MySQL

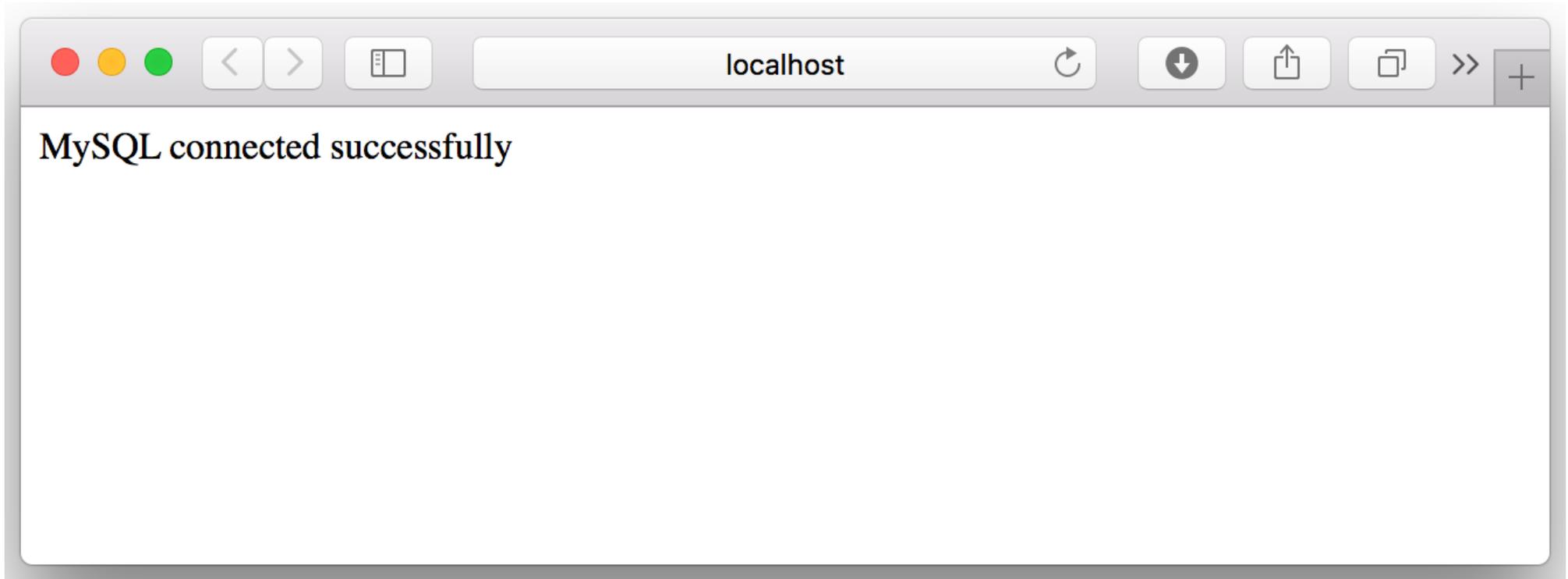
Step 1: Connect to MySQL

```
$servername = "127.0.0.1";
$username = "root";
$password = "abc123";

// Create connection
$conn = mysqli_connect($servername, $username, $password);

// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
} else {
    echo "MySQL connected successfully";
}
```

Step 1: Connect to MySQL



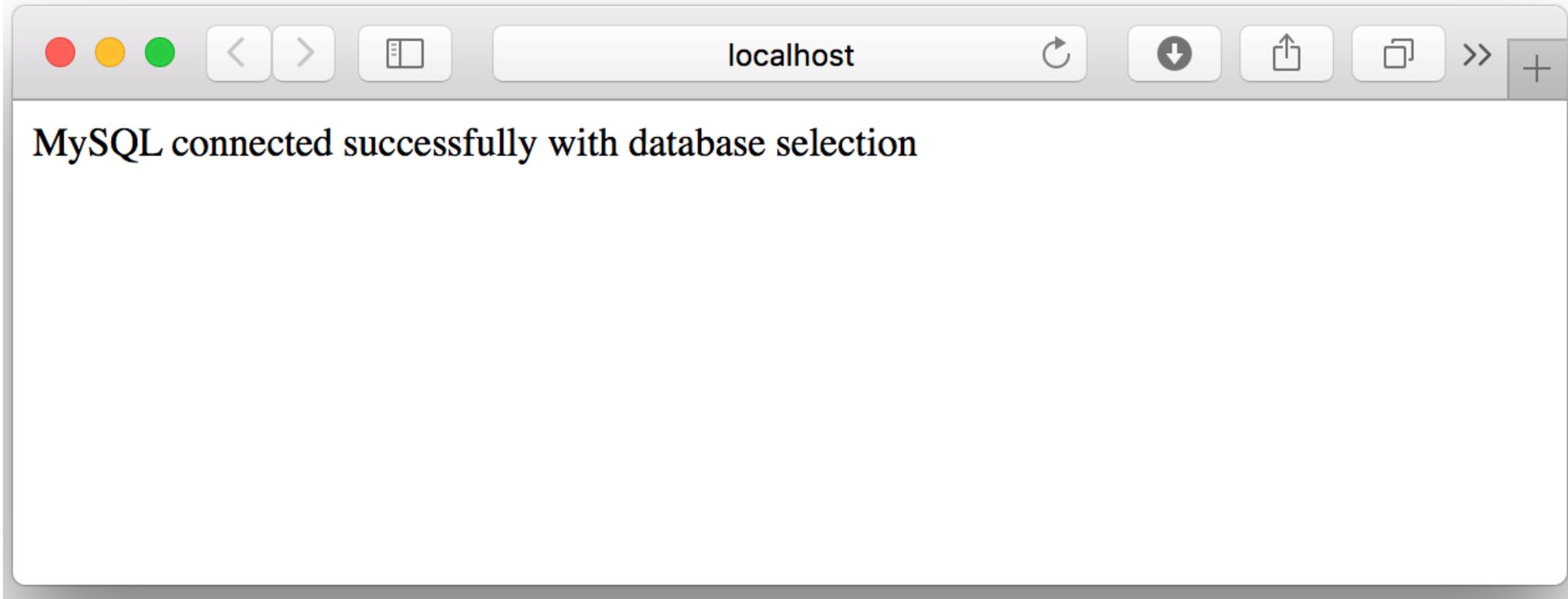
Step 2: Select database to use

```
$servername = "127.0.0.1";
$username = "root";
$password = "abc123";
$dbname = "usth";

// Create connection
$conn = mysqli_connect($servername, $username, $password, $dbname);

// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
} else {
    echo "MySQL connected successfully with database selection";
}
```

Step 2: Select database to use



Steps 3, 4: Build and execute query

- Four basic SQL Statements are:
 - Insert
 - Update
 - Delete
 - Select

“Insert” SQL Query

id	firstname	lastname	email	dept
1	Phuong	NT	phuongnt@gmail.com	ICT
2	Quang	DN	quangdn@gmail.com	ICT
3	Son	TG	sontg@gmail.com	ICT
4	Tung	TH	tungth@gmail.com	Nano
5	Tuan	GA	tuanga@gmail.com	Space
6	Ton	LA	tonlh@gmail.com	Space

- Task: Insert the new staff “**Nguyen Kieu Oanh, oanhnk, BIO**” into “staff” table of “usth” database

“Insert” SQL Query

- Build “Insert” query:

```
$sql = "INSERT INTO staff (firstname, lastname, email,dept)  
VALUES ('Oanh', 'NK', 'oanhnk@gmail.com', 'BI0')";
```

- Execute “Insert” query:

```
if (mysqli_query($conn, $sql)) {  
    echo "Execute insert query successfully";  
} else {  
    echo "Error: " . $sql . "<br>" . mysqli_error($conn);  
}
```

“Insert” SQL Query

- **Result of “insert” query:** Insert successfully “Oanh NK” into database

```
+-----+-----+-----+-----+
| id | firstname | lastname | email | dept |
+-----+-----+-----+-----+
| 1 | Phuong | NT | phuongnt@gmail.com | ICT |
| 2 | Quang | DN | quangdn@gmail.com | ICT |
| 3 | Son | TG | sontg@gmail.com | ICT |
| 4 | Tung | TH | tungth@gmail.com | Nano |
| 5 | Tuan | GA | tuanga@gmail.com | Space |
| 6 | Ton | LA | tonlh@gmail.com | Space |
| 7 | Oanh | NK | oanhnk@gmail.com | BIO |
+-----+-----+-----+-----+
```

“Update” SQL Query

id	firstname	lastname	email	dept
1	Phuong	NT	phuongnt@gmail.com	ICT
2	Quang	DN	quangdn@gmail.com	ICT
3	Son	TG	sontg@gmail.com	ICT
4	Tung	TH	tungth@gmail.com	Nano
5	Tuan	GA	tuanga@gmail.com	Space
6	Ton	LA	tonlh@gmail.com	Space
7	Oanh	NK	oanhnk@gmail.com	BIO

- Task: Update the “dept” of staff “Phuong NT” to “Nano”

“Update” SQL Query

- Build “Update” query:

```
$sql = "UPDATE staff SET dept='Nano' WHERE firstname='Phuong';"
```

- Execute “Update” query:

```
if (mysqli_query($conn, $sql)) {  
    echo "Execute update query successfully";  
} else {  
    echo "Error: " . $sql . "<br>" . mysqli_error($conn);  
}
```

“Update” SQL Query

- **Result of “update” query:** Update successfully “dept” of “Phuong NT” to “Nano”

id	firstname	lastname	email	dept
1	Phuong	NT	phuongnt@gmail.com	Nano
2	Quang	DN	quangdn@gmail.com	ICT
3	Son	TG	sontg@gmail.com	ICT
4	Tung	TH	tungth@gmail.com	Nano
5	Tuan	GA	tuanga@gmail.com	Space
6	Ton	LA	tonlh@gmail.com	Space
7	Oanh	NK	oanhnk@gmail.com	BIO

“Delete” SQL Query

id	firstname	lastname	email	dept
1	Phuong	NT	phuongnt@gmail.com	Nano
2	Quang	DN	quangdn@gmail.com	ICT
3	Son	TG	sontg@gmail.com	ICT
4	Tung	TH	tungth@gmail.com	Nano
5	Tuan	GA	tuanga@gmail.com	Space
6	Ton	LA	tonlh@gmail.com	Space
7	Oanh	NK	oanhnk@gmail.com	BIO

- Task: Delete the staff “**Ton LA**” from “staff” table of “usth” database

“Delete” SQL Query

- Build “Delete” query:

```
$sql = "DELETE FROM staff WHERE firstname='Ton';"
```

- Execute “Delete” query:

```
if (mysqli_query($conn, $sql)) {  
    echo "Execute delete query successfully";  
} else {  
    echo "Error: " . $sql . "<br>" . mysqli_error($conn);  
}
```

“Delete” SQL Query

- **Result of “delete” query:** Delete successfully “Ton LA” from database

id	firstname	lastname	email	dept
1	Phuong	NT	phuongnt@gmail.com	Nano
2	Quang	DN	quangdn@gmail.com	ICT
3	Son	TG	sontg@gmail.com	ICT
4	Tung	TH	tungth@gmail.com	Nano
5	Tuan	GA	tuanga@gmail.com	Space
7	Oanh	NK	oanhnk@gmail.com	BIO

“Select” SQL Query

id	firstname	lastname	email	dept
1	Phuong	NT	phuongnt@gmail.com	Nano
2	Quang	DN	quangdn@gmail.com	ICT
3	Son	TG	sontg@gmail.com	ICT
4	Tung	TH	tungth@gmail.com	Nano
5	Tuan	GA	tuanga@gmail.com	Space
7	Oanh	NK	oanhnk@gmail.com	BIO

- Task: **Select all staffs** from “staff” table of “usth” database

“Select” SQL Query

- Build “Select” query:

```
$sql = "SELECT * FROM staff";
```

- Execute “Select” query:

```
$result = mysqli_query($conn, $sql);
```

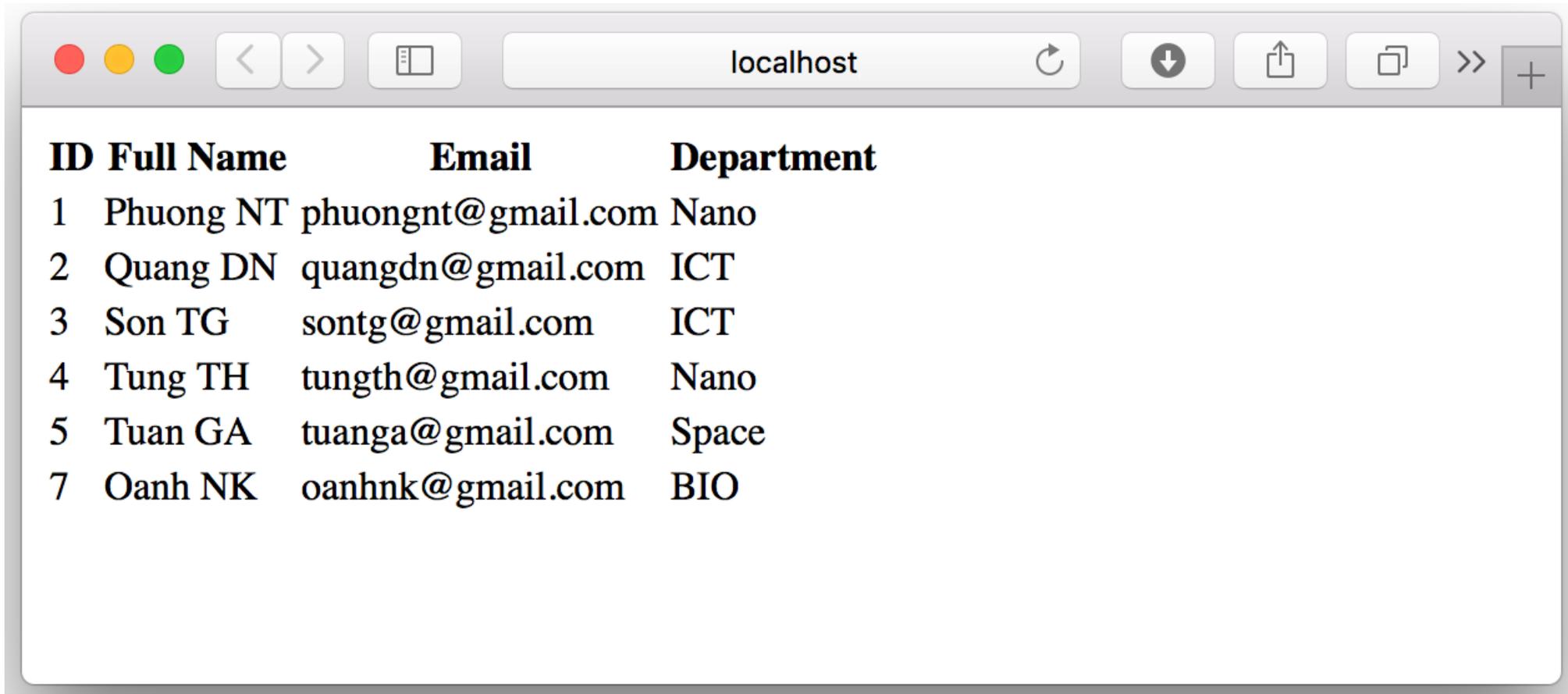
Steps 5, 6: Retrieve and process results

- Task: **retrieve and display** results of “select” query in a table

```
if (mysqli_num_rows($result) > 0) {  
  
    echo "<table><tr><th>ID</th><th>Full Name</th><th>Email</th><th>Department</th></tr>";  
  
    // output data of each row  
    while($row = mysqli_fetch_assoc($result)) {  
        echo "<tr><td>". $row["id"]. "</td><td>". $row["firstname"]. " ". $row["lastname"].  
            "</td><td>". $row["email"]. " </td><td>". $row["dept"] . " </td></tr>";  
    }  
} else {  
    echo "0 results";  
}
```

Steps 5, 6: Retrieve and process results

- Result of “select” query: list of USTH staff



The screenshot shows a web browser window with the address bar set to "localhost". The main content area displays a table with the following data:

ID	Full Name	Email	Department
1	Phuong NT	phuongnt@gmail.com	Nano
2	Quang DN	quangdn@gmail.com	ICT
3	Son TG	sontg@gmail.com	ICT
4	Tung TH	tungth@gmail.com	Nano
5	Tuan GA	tuanga@gmail.com	Space
7	Oanh NK	oanhnk@gmail.com	BIO

Step 7: Disconnect from MySQL

```
mysqli_close($conn);
```

