# Department of Computing

**CS-213: Advanced Programming**

**Class: BSCS 7AB**

# Lab 5: Node.js MySQL

**Date: 3rd October, 2019**

**Time: 10:00-01:00pm & 02:00-05:00pm**

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# Lab 5: Node.js MySQL

**Introduction**

Node.js can be used in database applications. One of the most popular databases is MySQL.client.

**Objectives**

This lab will get you familiar with the node.js mysql environment.

**Tools/Software Requirement**

Node.js, Notepad

**Description**

## **MySQL Database**

To be able to experiment with the code examples, you should have MySQL installed on your computer.

You can download a free MySQL database at <https://www.mysql.com/downloads/>.

**Install MySQL Driver**

Once you have MySQL up and running on your computer, you can access it by using Node.js.

To access a MySQL database with Node.js, you need a MySQL driver. This tutorial will use the "mysql" module, downloaded from NPM.

To download and install the "mysql" module, open the Command Terminal and execute the following:

C:\Users\Your Name>npm install mysql

Now you have downloaded and installed a mysql database driver.

Node.js can use this module to manipulate the MySQL database:

var mysql = require('mysql');

**Helping Material**

Slides of Lecture 6

<https://www.w3schools.com/nodejs/nodejs_mysql.asp>

**Lab Tasks**

**Task 1:** Start by creating a connection to the database. Use the username and password from your MySQL database.

**Task 2:** Use SQL statements to read from (or write to) a MySQL database. The query method takes an sql statements as a parameter and returns the result.

**Task 3:** Create a database named "mydb". Save the code in a file called "demo\_create\_db.js" and run the file.

**Task 4:** Create a table named "customers". Save the code above in a file called "demo\_create\_table.js" and run the file

**Task 5:** Create primary key when creating the table. If the table already exists, use the ALTER TABLE keyword.

**Task 6:** Insert a record in the "customers" table. Save the code above in a file called "demo\_db\_insert.js", and run the file.

**Task 7:** Fill the "customers" table with multiple data. Save the code above in a file called "demo\_db\_insert\_multple.js", and run the file. Return the number of affected rows

**Task 8:** Select all records from the "customers" table, and display the result object. Save the code above in a file called "demo\_db\_select.js" and run the file

**Task 9:** Select name and address from the "customers" table, and display the return object. Save the code above in a file called "demo\_db\_select2.js" and run the file

**Task 10:** Select all records from the "customers" table, and display the fields object. Save the code above in a file called "demo\_db\_select\_fields.js" and run the file

**Task11:** Select record(s) with the address "Park Lane 38". Save the code above in a file called "demo\_db\_where.js" and run the file

**Task 12:** Select records where the address starts with the letter 'S'. Save the code above in a file called "demo\_db\_where\_s.js" and run the file.

**Task 13:** Sort the result alphabetically by name. Save the code above in a file called "demo\_db\_orderby.js" and run the file

**Task 14:** Delete any record with the address "Mountain 21". Save the code above in a file called "demo\_db\_delete.js" and run the file.

**Task 15:** Delete the table "customers". Save the code above in a file called "demo\_db\_drop\_table\_if.js" and run the file.

**Task 16:** Overwrite the address column from "Valley 345" to "Canyon 123". Save the code above in a file called "demo\_db\_update.js" and run the file

**Task 17:** Select the 5 first records in the "customers" table. Save the code above in a file called "demo\_db\_limit.js" and run the file. Now Start from position 3, and return the next 5 records.

**Task 18:** Practice the Join operations on different tables.

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| Solution |
| Task 1 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  port: "3306",  user: "root",  password: "usama"  });  con.connect(function(err) {  if (err) throw err;  console.log("Connected!");  });  Task 1 Screenshot:  Task 2 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  port: "3306",  user: "root",  password: "usama"  });  con.connect(function(err) {  if (err) throw err;  console.log("Connected!");  con.query(“SELECT \* FROM Customers”, function (err, result) {  if (err) throw err;  console.log("Result: " + result);  });  });  Task 3 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  port: "3306",  user: "root",  password: "usama"  });  con.connect(function(err) {  if (err) throw err;  console.log("Connected!");  con.query("CREATE DATABASE mydb", function (err, result) {  if (err) throw err;  console.log("Database created");  });  });  Task 3 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\task 3.PNG  Task 4 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  console.log("Connected!");  var sql = "CREATE TABLE customers (name VARCHAR(255), address VARCHAR(255))";  con.query(sql, function (err, result) {  if (err) throw err;  console.log("Table created");  });  });  Task 4 Screenshot:  Task 5 Code:  con.connect(function(err) {  if (err) throw err;  console.log("Connected!");  var sql = "ALTER TABLE customers ADD COLUMN id INT AUTO\_INCREMENT PRIMARY KEY";  con.query(sql, function (err, result) {  if (err) throw err;  console.log("Table altered");  });  });  Task 5 Screenshot:  Task 6 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  console.log("Connected!");  var sql = "INSERT INTO customers (name, address) VALUES ('Company Inc', 'Highway 37')";  con.query(sql, function (err, result) {  if (err) throw err;  console.log("1 record inserted");  });  });  Task 6 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 6.PNG  Task 7 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  console.log("Connected!");  var sql = "INSERT INTO customers (name, address) VALUES ?";  var values = [  ['John', 'Highway 71'],  ['Peter', 'Lowstreet 4'],  ['Amy', 'Apple st 652'],  ['Hannah', 'Mountain 21'],  ['Michael', 'Valley 345'],  ['Sandy', 'Ocean blvd 2'],  ['Betty', 'Green Grass 1'],  ['Richard', 'Sky st 331'],  ['Susan', 'One way 98'],  ['Vicky', 'Yellow Garden 2'],  ['Ben', 'Park Lane 38'],  ['William', 'Central st 954'],  ['Chuck', 'Main Road 989'],  ['Viola', 'Sideway 1633']  ];  con.query(sql, [values], function (err, result) {  if (err) throw err;  console.log("Number of records inserted: " + result.affectedRows);  });  });  Task 7 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 7.PNG  Task 8 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  con.query("SELECT \* FROM customers", function (err, result, fields) {  if (err) throw err;  console.log(result);  });  });  Task 8 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 8.PNG  Task 9 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  con.query("SELECT name, address FROM customers", function (err, result, fields) {  if (err) throw err;  console.log(result);  });  }); Task 9 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 9.PNG  Task 10 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  con.query("SELECT name, address FROM customers", function (err, result, fields) {  if (err) throw err;  console.log(fields);  });  });  Task 10 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 10.PNG  Task 11 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  con.query("SELECT \* FROM customers WHERE address = 'Park Lane 38'", function (err, result) {  if (err) throw err;  console.log(result);  });  });  Task 11 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 11.PNG  Task 12 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  con.query("SELECT \* FROM customers WHERE address LIKE 'S%'", function (err, result) {  if (err) throw err;  console.log(result);  });  });  Task 12 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 12.PNG  Task 13 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  con.query("SELECT \* FROM customers ORDER BY name", function (err, result) {  if (err) throw err;  console.log(result);  });  });  Task 13 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 13.PNG  Task 14 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  var sql = "DELETE FROM customers WHERE address = 'Mountain 21'";  con.query(sql, function (err, result) {  if (err) throw err;  console.log("Number of records deleted: " + result.affectedRows);  });  });  Task 14 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 14.PNG  Task 15 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  var sql = "DROP TABLE IF EXISTS customers";  con.query(sql, function (err, result) {  if (err) throw err;  console.log(result);  });  });  Task 15 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 15.PNG  Task 16 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  var sql = "UPDATE customers SET address = 'Canyon 123' WHERE address = 'Valley 345'";  con.query(sql, function (err, result) {  if (err) throw err;  console.log(result.affectedRows + " record(s) updated");  });  });  Task 16 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 16.PNG  Task 17 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  var sql = "SELECT \* FROM customers LIMIT 5";  con.query(sql, function (err, result) {  if (err) throw err;  console.log(result);  });  });  con.connect(function(err) {  if (err) throw err;  var sql = "SELECT \* FROM customers LIMIT 5 OFFSET 2";  con.query(sql, function (err, result) {  if (err) throw err;  console.log(result);  });  });  Task 17 Screenshot:  C:\Users\musama.bscs17seecs\Desktop\Task 17.PNG  C:\Users\musama.bscs17seecs\Desktop\273.PNG  Task 18 Code:  var mysql = require('mysql');  var con = mysql.createConnection({  host: "localhost",  user: "root",  password: "usama",  database: "mydb"  });  con.connect(function(err) {  if (err) throw err;  var sql = "SELECT users.name AS user, products.name AS favorite FROM users JOIN products ON users.favorite\_product = products.id";  con.query(sql, function (err, result) {  if (err) throw err;  console.log(result);  });  });  LEFT JOIN: SELECT users.name AS user,  products.name AS favorite  FROM users  LEFT JOIN products ON users.favorite\_product = products.id  C:\Users\musama.bscs17seecs\Desktop\lllllllllllllllllll.PNG  RIGHT JOIN:  SELECT users.name AS user,  products.name AS favorite  FROM users  RIGHT JOIN products ON users.favorite\_product = products.id  C:\Users\musama.bscs17seecs\Desktop\rrrr.PNG |

### Deliverables

Compile a single word document by filling in the solution part and submit this Word file on LMS. This lab grading policy is as follows: The lab is graded between 0 to 10 marks. The submitted solution can get a maximum of 5 marks. At the end of each lab or in the next lab, there will be a viva related to the tasks. The viva has a weightage of 5 marks. Insert the solution/answer in this document. You must show the implementation of the tasks in the designing tool, along with your complete Word document to get your work graded. You must also submit this Word document on the LMS. In case of any problems with submissions on LMS, submit your Lab assignments by emailing it to Ms. Ayesha Asif: [ayesha.asif@seecs.edu.pk](mailto:ayesha.asif@seecs.edu.pk).