Node.js Notes

- Node.js is an open source server environment.

- Node.js allows you to run JavaScript on the server.

What is Node.js?

- Node.js is an open source server environment
- Node.js is free
- Node.js runs on various platforms (Windows, Linux, Unix, Mac OS X, etc.)
- Node.js uses JavaScript on the server

Why Node.js?

Node.js uses asynchronous programming!

A common task for a web server can be to open a file on the server and return the content to the client.

Here is how PHP or ASP handles a file request:

1. Sends the task to the computer's file system.
2. Waits while the file system opens and reads the file.
3. Returns the content to the client.
4. Ready to handle the next request.

Here is how Node.js handles a file request:

1. Sends the task to the computer's file system.
2. Ready to handle the next request.
3. When the file system has opened and read the file, the server returns the content to the client.

Node.js eliminates the waiting, and simply continues with the next request.

Node.js runs single-threaded, non-blocking, asynchronous programming, which is very memory efficient.

What Can Node.js Do?

- Node.js can generate dynamic page content
- Node.js can create, open, read, write, delete, and close files on the server
- Node.js can collect form data
- Node.js can add, delete, modify data in your database

What is a Node.js File?

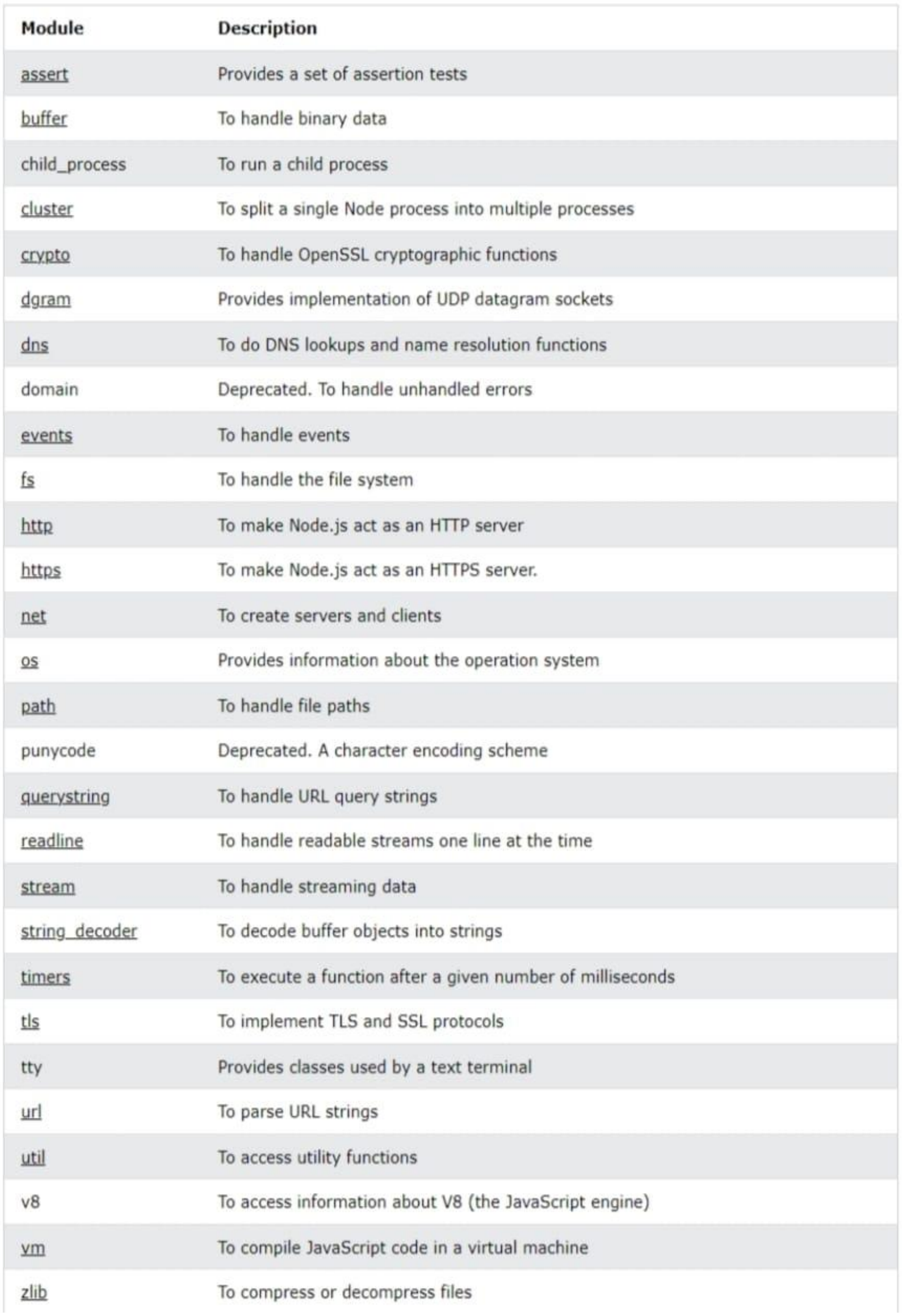
- Node.js files contain tasks that will be executed on certain events
- A typical event is someone trying to access a port on the server
- Node.js files must be initiated on the server before having any effect
- Node.js files have extension ".js"

What is a Module in Node.js?

- Consider modules to be the same as JavaScript libraries.
- A set of functions you want to include in your application.

Node.js has a set of built-in modules which you can use without any further installation.

Here is a list of the built-in modules of Node.js version 6.10.3:



Module	Description
assert	Provides a set of assertion tests
buffer	To handle binary data
child_process	To run a child process
cluster	To split a single Node process into multiple processes
crypto	To handle OpenSSL cryptographic functions
dgram	Provides implementation of UDP datagram sockets
dns	To do DNS lookups and name resolution functions
domain	Deprecated. To handle unhandled errors
events	To handle events
fs	To handle the file system
http	To make Node.js act as an HTTP server
https	To make Node.js act as an HTTPS server.
net	To create servers and clients
os	Provides information about the operation system
path	To handle file paths
punycode	Deprecated. A character encoding scheme
querystring	To handle URL query strings
readline	To handle readable streams one line at the time
stream	To handle streaming data
string_decoder	To decode buffer objects into strings
timers	To execute a function after a given number of milliseconds
tls	To implement TLS and SSL protocols
tty	Provides classes used by a text terminal
url	To parse URL strings
util	To access utility functions
v8	To access information about V8 (the JavaScript engine)
vm	To compile JavaScript code in a virtual machine
zlib	To compress or decompress files

The Built-in HTTP Module

- Node.js has a built-in module called HTTP, which allows Node.js to transfer data over the Hyper Text Transfer Protocol (HTTP).

- To include the HTTP module, use the require() method:

```
var http = require('http');
```

Node.js as a Web Server

The HTTP module can create an HTTP server that listens to server ports and gives a response back to the client.

Use the createServer() method to create an HTTP server:

Example:

```
var http = require('http');

//create a server object:
http.createServer(function (req, res) {
  res.write('Hello World!'); //write a response to the client
  res.end(); //end the response
}).listen(8080); //the server object listens on port 8080
```

The function passed into the http.createServer() method, will be executed when someone tries to access the computer on port 8080.

Add an HTTP Header

If the response from the HTTP server is supposed to be displayed as HTML, you should include an HTTP header with the correct content type:

Example

```
var http = require('http');
http.createServer(function (req, res) {
  res.writeHead(200, {'Content-Type': 'text/html'});
  res.write('Hello World!');
  res.end();
}).listen(8080);
```

The first argument of the `res.writeHead()` method is the status code, 200 means that all is OK, the second argument is an object containing the response headers.

Read the Query String

The function passed into the `http.createServer()` has a `req` argument that represents the request from the client, as an object (http.IncomingMessage object).

This object has a property called "url" which holds the part of the url that comes after the domain name:

demo_http_url.js

```
var http = require('http');
http.createServer(function (req, res) {
  res.writeHead(200, {'Content-Type': 'text/html'});
  res.write(req.url);
  res.end();
}).listen(8080);
```

Split the Query String

There are built-in modules to easily split the query string into readable parts, such as the URL module.

Example

Split the query string into readable parts:

```
var http = require('http');
var url = require('url');

http.createServer(function (req, res) {
  res.writeHead(200, {'Content-Type': 'text/html'});
  var q = url.parse(req.url, true).query;
  var txt = q.year + " " + q.month;
  res.end(txt);
}).listen(8080);
```

Node.js as a File Server

The Node.js file system module allows you to work with the file system on your computer.

To include the File System module, use the `require()` method:

```
var fs = require('fs');
```

Common use for the File System module:

- Read files
- Create files
- Update files
- Delete files
- Rename files

Read Files

The `fs.readFile()` method is used to read files on your computer.

Assume we have the following HTML file (located in the same folder as Node.js):

demofile1.html

```
<html>
<body>
<h1>My Header</h1>
<p>My paragraph.</p>
</body>
</html>
```

Create a Node.js file that reads the HTML file, and return the content:

Example:

```
var http = require('http');
var fs = require('fs');
http.createServer(function (req, res) {
  fs.readFile('demofile1.html', function(err, data) {
    res.writeHead(200, {'Content-Type': 'text/html'});
    res.write(data);
    return res.end();
  });
}).listen(8080);
```

Create Files

The File System module has methods for creating new files:

- `fs.appendFile()`
- `fs.open()`
- `fs.writeFile()`

The `fs.appendFile()` method appends specified content to a file. If the file does not exist, the file will be created:

Example:

Create a new file using the appendFile() method:

```
var fs = require('fs');

fs.appendFile('mynewfile1.txt', 'Hello content!', function (err) {
  if (err) throw err;
  console.log('Saved!');
});
```

The `fs.open()` method takes a "flag" as the second argument, if the flag is "w" for "writing", the specified file is opened for writing. If the file does not exist, an empty file is created:

Example:

Create a new, empty file using the open() method:

```
var fs = require('fs');

fs.open('mynewfile2.txt', 'w', function (err, file) {
  if (err) throw err;
  console.log('Saved!');
});
```

The `fs.writeFile()` method replaces the specified file and content if it exists. If the file does not exist, a new file, containing the specified content, will be created:

Example:

Create a new file using the writeFile() method:

```
var fs = require('fs');

fs.writeFile('mynewfile3.txt', 'Hello content!', function (err) {
  if (err) throw err;
  console.log('Saved!');
});
```

Update Files

The File System module has methods for updating files:

- `fs.appendFile()`
- `fs.writeFile()`

The `fs.appendFile()` method appends the specified content at the end of the specified file:

Example:

Append "This is my text." to the end of the file "mynewfile1.txt":

```
var fs = require('fs');

fs.appendFile('mynewfile1.txt', ' This is my text.', function (err) {
  if (err) throw err;
  console.log('Updated!');
});
```

The `fs.writeFile()` method replaces the specified file and content:

Example:

Replace the content of the file "mynewfile3.txt":

```
var fs = require('fs');

fs.writeFile('mynewfile3.txt', 'This is my text', function (err) {
  if (err) throw err;
  console.log('Replaced!');
});
```

Delete Files

To delete a file with the File System module, use the `fs.unlink()` method.

The `fs.unlink()` method deletes the specified file:

Example:

Delete "mynewfile2.txt":

```
var fs = require('fs');

fs.unlink('mynewfile2.txt', function (err) {
  if (err) throw err;
  console.log('File deleted!');
});
```

Rename Files

To rename a file with the File System module, use the `fs.rename()` method.

The `fs.rename()` method renames the specified file:

Example:

Rename "mynewfile1.txt" to "myrenamedfile.txt":

```
var fs = require('fs');

fs.rename('mynewfile1.txt', 'myrenamedfile.txt', function (err) {
  if (err) throw err;
  console.log('File Renamed!');
});
```

The Built-in URL Module

The URL module splits up a web address into readable parts.

To include the URL module, use the `require()` method:

```
var url = require('url');
```

Parse an address with the `url.parse()` method, and it will return a URL object with each part of the address as properties:

Example :

Split a web address into readable parts:

```
var url = require('url');
var adr = 'http://localhost:8080/default.htm?year=2017&month=february';
var q = url.parse(adr, true);

console.log(q.host); //returns 'localhost:8080'
console.log(q.pathname); //returns '/default.htm'
console.log(q.search); //returns '?year=2017&month=february'

var qdata = q.query; //returns an object: { year: 2017, month: 'february' }
console.log(qdata.month); //returns 'february'
```

What is NPM?

NPM is a package manager for Node.js packages, or modules if you like.

www.npmjs.com hosts thousands of free packages to download and use.

The NPM program is installed on your computer when you install Node.js

NPM is already ready to run on your computer!

What is a Package?

A package in Node.js contains all the files you need for a module.

Modules are JavaScript libraries you can include in your project.

Using a Package

Once the package is installed, it is ready to use.

Include the "upper-case" package the same way you include any other module:

```
var uc = require('upper-case');
```

Create a Node.js file that will convert the output "Hello World!" into upper-case letters:

Example :

```
var http = require('http');
var uc = require('upper-case');
http.createServer(function (req, res) {
  res.writeHead(200, {'Content-Type': 'text/html'});
  res.write(uc.upperCase("Hello World!"));
  res.end();
}).listen(8080);
```

Node.js is perfect for event-driven applications.

Events in Node.js

Every action on a computer is an event. Like when a connection is made or a file is opened.

Objects in Node.js can fire events, like the readStream object fires events when opening and closing a file:

Example

```
var fs = require('fs');
var rs = fs.createReadStream('./demofile.txt');
rs.on('open', function () {
  console.log('The file is open');
});
```

Events Module

Node.js has a built-in module, called "Events", where you can create-, fire-, and listen for- your own events.

To include the built-in Events module use the `require()` method. In addition, all event properties and methods are an instance of an EventEmitter object. To be able to access these properties and methods, create an EventEmitter object:

```
var events = require('events');
var eventEmitter = new events.EventEmitter();
```

The EventEmitter Object

You can assign event handlers to your own events with the EventEmitter object.

In the example below we have created a function that will be executed when a "scream" event is fired.

To fire an event, use the `emit()` method.

Example

```
var events = require('events');
var eventEmitter = new events.EventEmitter();

//Create an event handler:
var myEventHandler = function () {
  console.log('I hear a scream!');
}

//Assign the event handler to an event:
eventEmitter.on('scream', myEventHandler);

//Fire the 'scream' event:
eventEmitter.emit('scream');
```

The Formidable Module

There is a very good module for working with file uploads, called "Formidable".

The Formidable module can be downloaded and installed using NPM:

```
C:\Users\Your Name>npm install formidable
```

After you have downloaded the Formidable module, you can include the module in any application:

```
var formidable = require('formidable');
```

Upload Files

Now you are ready to make a web page in Node.js that lets the user upload files to your computer:

Step 1: Create an Upload Form

Create a Node.js file that writes an HTML form, with an upload field:

Example

This code will produce an HTML form:

```
var http = require('http');

http.createServer(function (req, res) {
  res.writeHead(200, {'Content-Type': 'text/html'});
  res.write('<form action="fileupload" method="post"
enctype="multipart/form-data">');
  res.write('<input type="file" name="filetoupload"><br>');
  res.write('<input type="submit">');
  res.write('</form>');
  return res.end();
}).listen(8080);
```

Step 2: Parse the Uploaded File

Include the Formidable module to be able to parse the uploaded file once it reaches the server.

When the file is uploaded and parsed, it gets placed on a temporary folder on your computer.

Example

The file will be uploaded, and placed on a temporary folder:

```
var http = require('http');
var formidable = require('formidable');

http.createServer(function (req, res) {
  if (req.url == '/fileupload') {
    var form = new formidable.IncomingForm();
    form.parse(req, function (err, fields, files) {
      res.write('File uploaded');
      res.end();
    });
  } else {
    res.writeHead(200, {'Content-Type': 'text/html'});
    res.write('<form action="fileupload" method="post"
enctype="multipart/form-data">');
    res.write('<input type="file" name="filetoupload"><br>');
    res.write('<input type="submit">');
    res.write('</form>');
    return res.end();
  }
}).listen(8080);
```

Step 3: Save the File

When a file is successfully uploaded to the server, it is placed on a temporary folder.

The path to this directory can be found in the "files" object, passed as the third argument in the `parse()` method's callback function.

To move the file to the folder of your choice, use the File System module, and rename the file:

Example

Include the fs module, and move the file to the current folder:

```
var http = require('http');
var formidable = require('formidable');
var fs = require('fs');

http.createServer(function (req, res) {
  if (req.url == '/fileupload') {
    var form = new formidable.IncomingForm();
    form.parse(req, function (err, fields, files) {
      var oldpath = files.filetoupload.filepath;
      var newpath = 'C:/Users/Your Name/' +
files.filetoupload.originalFilename;
      fs.rename(oldpath, newpath, function (err) {
        if (err) throw err;
        res.write('File uploaded and moved!');
        res.end();
      });
 });
  } else {
    res.writeHead(200, {'Content-Type': 'text/html'});
    res.write('<form action="fileupload" method="post"
enctype="multipart/form-data">');
    res.write('<input type="file" name="filetoupload"><br>');
    res.write('<input type="submit">');
    res.write('</form>');
    return res.end();
  }
}).listen(8080);
```

The Nodemailer Module

The Nodemailer module makes it easy to send emails from your computer.

The Nodemailer module can be downloaded and installed using npm:

```
C:\Users\Your Name>npm install nodemailer
```

After you have downloaded the Nodemailer module, you can include the module in any application:

```
var nodemailer = require('nodemailer');
```

Send an Email

Now you are ready to send emails from your server.

Use the username and password from your selected email provider to send an email. This tutorial will show you how to use your Gmail account to send an email:

Example

```
var nodemailer = require('nodemailer');

var transporter = nodemailer.createTransport({
  service: 'gmail',
  auth: {
    user: 'youremail@gmail.com',
    pass: 'yourpassword'
  }
});

var mailOptions = {
  from: 'youremail@gmail.com',
  to: 'myfriend@yahoo.com',
  subject: 'Sending Email using Node.js',
  text: 'That was easy!'
};

transporter.sendMail(mailOptions, function(error, info){
  if (error) {
    console.log(error);
  } else {
    console.log('Email sent: ' + info.response);
  }
});
```

And that's it! Now your server is able to send emails.

Multiple Receivers

To send an email to more than one receiver, add them to the "to" property of the mailOptions object, separated by commas:

Example

Send email to more than one address:

```
var mailOptions = {
  from: 'youremail@gmail.com',
  to: 'myfriend@yahoo.com, myotherfriend@yahoo.com',
  subject: 'Sending Email using Node.js',
  text: 'That was easy!'
}
```

Send HTML

To send HTML formatted text in your email, use the "html" property instead of the "text" property:

Example

Send email containing HTML:

```
var mailOptions = {
  from: 'youremail@gmail.com',
  to: 'myfriend@yahoo.com',
  subject: 'Sending Email using Node.js',
  html: '<h1>Welcome</h1><p>That was easy!</p>'
}
```

Node.js MongoDB

Node.js can be used in database applications.

One of the most popular NoSQL database is MongoDB.

Install MongoDB Driver

Let us try to access a MongoDB database with Node.js.

To download and install the official MongoDB driver, open the Command Terminal and execute the following:

Download and install mongodb package:

```
C:\Users\Your Name>npm install mongodb
```

Now you have downloaded and installed a mongodb database driver.

Node.js can use this module to manipulate MongoDB databases:

```
var mongo = require('mongodb');
```

Creating a Database

To create a database in MongoDB, start by creating a MongoClient object, then specify a connection URL with the correct ip address and the name of the database you want to create.

MongoDB will create the database if it does not exist, and make a connection to it.

Example

Create a database called "mydb":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/mydb";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  console.log("Database created!");
  db.close();
});
```

Important: In MongoDB, a database is not created until it gets content!

Creating a Collection

A **collection** in MongoDB is the same as a **table** in MySQL

To create a collection in MongoDB, use the `createCollection()` method:

Example

Create a collection called "customers":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  dbo.createCollection("customers", function(err, res) {
    if (err) throw err;
    console.log("Collection created!");
    db.close();
  });
});
```

Insert Into Collection

To insert a record, or *document* as it is called in MongoDB, into a collection, we use the `insertOne()` method.

A **document** in MongoDB is the same as a **record** in MySQL

The first parameter of the `insertOne()` method is an object containing the name(s) and value(s) of each field in the document you want to insert.

It also takes a callback function where you can work with any errors, or the result of the insertion:

Example

Insert a document in the "customers" collection:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myobj = { name: "Company Inc", address: "Highway 37" };
  dbo.collection("customers").insertOne(myobj, function(err, res) {
    if (err) throw err;
    console.log("1 document inserted");
    db.close();
  });
});
```

Note: If you try to insert documents in a collection that do not exist, MongoDB will create the collection automatically.

Insert Multiple Documents

To insert multiple documents into a collection in MongoDB, we use the `insertMany()` method.

The first parameter of the `insertMany()` method is an array of objects, containing the data you want to insert.

It also takes a callback function where you can work with any errors, or the result of the insertion:

Example

Insert multiple documents in the "customers" collection:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myobj = [
    { name: 'John', address: 'Highway 71'},
    { name: 'Peter', address: 'Lowstreet 4'},
    { name: 'Amy', address: 'Apple st 652'},
    { name: 'Hannah', address: 'Mountain 21'},
    { name: 'Michael', address: 'Valley 345'},
    { name: 'Sandy', address: 'Ocean blvd 2'},
    { name: 'Betty', address: 'Green Grass 1'},
    { name: 'Richard', address: 'Sky st 331'},
    { name: 'Susan', address: 'One way 98'},
    { name: 'Vicky', address: 'Yellow Garden 2'},
    { name: 'Ben', address: 'Park Lane 38'},
    { name: 'William', address: 'Central st 954'},
    { name: 'Chuck', address: 'Main Road 989'},
    { name: 'Viola', address: 'Sideway 1633'}
  ];
  dbo.collection("customers").insertMany(myobj, function(err, res) {
    if (err) throw err;
    console.log("Number of documents inserted: " + res.insertedCount);
    db.close();
  });
});
```

The _id Field

If you do not specify an `_id` field, then MongoDB will add one for you and assign a unique id for each document.

In the example above no `_id` field was specified, and as you can see from the result object, MongoDB assigned a unique _id for each document.

If you *do* specify the `_id` field, the value must be unique for each document:

Example

Insert three records in a "products" table, with specified `_id` fields:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myobj = [
    { _id: 154, name: 'Chocolate Heaven'},
    { _id: 155, name: 'Tasty Lemon'},
    { _id: 156, name: 'Vanilla Dream'}
  ];
  dbo.collection("products").insertMany(myobj, function(err, res) {
    if (err) throw err;
    console.log(res);
    db.close();
  });
});
```

Node.js MongoDB Find

In MongoDB we use the **find** and **findOne** methods to find data in a collection.

Just like the **SELECT** statement is used to find data in a table in a MySQL database.

Find One

To select data from a collection in MongoDB, we can use the `findOne()` method.

The `findOne()` method returns the first occurrence in the selection.

The first parameter of the `findOne()` method is a query object. In this example we use an empty query object, which selects all documents in a collection (but returns only the first document).

Example

Find the first document in the customers collection:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  dbo.collection("customers").findOne({}, function(err, result) {
    if (err) throw err;
    console.log(result.name);
    db.close();
  });
});
```

Find All

To select data from a table in MongoDB, we can also use the `find()` method.

The `find()` method returns all occurrences in the selection.

The first parameter of the `find()` method is a query object. In this example we use an empty query object, which selects all documents in the collection.

No parameters in the find() method gives you the same result as **SELECT *** in MySQL.

Example

Find all documents in the customers collection:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  dbo.collection("customers").find({}).toArray(function(err, result) {
    if (err) throw err;
    console.log(result);
    db.close();
  });
});
```

Find Some

The second parameter of the `find()` method is the `projection` object that describes which fields to include in the result.

This parameter is optional, and if omitted, all fields will be included in the result.

Example

Return the fields "name" and "address" of all documents in the customers collection:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  dbo.collection("customers").find({}, { projection: { _id: 0, name: 1,
address: 1 } }).toArray(function(err, result) {
    if (err) throw err;
    console.log(result);
    db.close();
  });
});
```

Node.js MongoDB Query

Filter the Result

When finding documents in a collection, you can filter the result by using a query object.

The first argument of the `find()` method is a query object, and is used to limit the search.

Example

Find documents with the address "Park Lane 38":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var query = { address: "Park Lane 38" };
  dbo.collection("customers").find(query).toArray(function(err, result) {
    if (err) throw err;
    console.log(result);
    db.close();
  });
});
```

Filter With Regular Expressions

You can write regular expressions to find exactly what you are searching for.

Regular expressions can only be used to query *strings*.

To find only the documents where the "address" field starts with the letter "S", use the regular expression `/^S/`:

Example

Find documents where the address starts with the letter "S":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var query = { address: /^S/ };
  dbo.collection("customers").find(query).toArray(function(err, result) {
    if (err) throw err;
    console.log(result);
    db.close();
  });
});
```

Node.js MongoDB Sort

Sort the Result

Use the `sort()` method to sort the result in ascending or descending order.

The `sort()` method takes one parameter, an object defining the sorting order.

Example

Sort the result alphabetically by name:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var mysort = { name: 1 };
  dbo.collection("customers").find().sort(mysort).toArray(function(err,
result) {
    if (err) throw err;
    console.log(result);
    db.close();
  });
});
```

Sort Descending

Use the value -1 in the sort object to sort descending.

```
{ name: 1 } // ascending
{ name: -1 } // descending
```

Example

Sort the result reverse alphabetically by name:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var mysort = { name: -1 };
  dbo.collection("customers").find().sort(mysort).toArray(function(err,
result) {
    if (err) throw err;
    console.log(result);
    db.close();
  });
});
```

Node.js MongoDB Delete

Delete Document

To delete a record, or document as it is called in MongoDB, we use the `deleteOne()` method.

The first parameter of the `deleteOne()` method is a query object defining which document to delete.

Note: If the query finds more than one document, only the first occurrence is deleted.

Example

Delete the document with the address "Mountain 21":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myquery = { address: 'Mountain 21' };
  dbo.collection("customers").deleteOne(myquery, function(err, obj) {
    if (err) throw err;
    console.log("1 document deleted");
    db.close();
  });
});
```

Delete Many

To delete more than one document, use the `deleteMany()` method.

The first parameter of the `deleteMany()` method is a query object defining which documents to delete.

Example

Delete all documents were the address starts with the letter "O":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";
```

```
MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myquery = { address: /^O/ };
  dbo.collection("customers").deleteMany(myquery, function(err, obj) {
    if (err) throw err;
    console.log(obj.result.n + " document(s) deleted");
    db.close();
  });
});
```

Node.js MongoDB Drop

Drop Collection

You can delete a table, or collection as it is called in MongoDB, by using the `drop()` method.

The `drop()` method takes a callback function containing the error object and the result parameter which returns true if the collection was dropped successfully, otherwise it returns false.

Example

Delete the "customers" table:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  dbo.collection("customers").drop(function(err, delOK) {
    if (err) throw err;
    if (delOK) console.log("Collection deleted");
    db.close();
  });
});
```

db.dropCollection

You can also use the `dropCollection()` method to delete a table (collection).

The `dropCollection()` method takes two parameters: the name of the collection and a callback function.

Example

Delete the "customers" collection, using dropCollection():

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  dbo.dropCollection("customers", function(err, delOK) {
    if (err) throw err;
    if (delOK) console.log("Collection deleted");
    db.close();
  });
});
```

Node.js MongoDB Update

Update Document

You can update a record, or document as it is called in MongoDB, by using the `updateOne()` method.

The first parameter of the `updateOne()` method is a query object defining which document to update.

Note: If the query finds more than one record, only the first occurrence is updated.

The second parameter is an object defining the new values of the document.

Example

Update the document with the address "Valley 345" to name="Mickey" and address="Canyon 123":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://127.0.0.1:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myquery = { address: "Valley 345" };
  var newvalues = { $set: {name: "Mickey", address: "Canyon 123" } };
  dbo.collection("customers").updateOne(myquery, newvalues, function(err,
res) {
    if (err) throw err;
    console.log("1 document updated");
    db.close();
  });
});
```

Update Only Specific Fields

When using the `$set` operator, only the specified fields are updated:

Example

Update the address from "Valley 345" to "Canyon 123":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myquery = { address: "Valley 345" };
  var newvalues = {$set: {address: "Canyon 123"} };
  dbo.collection("customers").updateOne(myquery, newvalues, function(err,
res) {
    if (err) throw err;
    console.log("1 document updated");
    db.close();
  });
});
```

Update Many Documents

To update *all* documents that meets the criteria of the query, use the `updateMany()` method.

Example

Update all documents where the name starts with the letter "S":

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://127.0.0.1:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  var myquery = { address: /^S/ };
  var newvalues = {$set: {name: "Minnie"} };
  dbo.collection("customers").updateMany(myquery,
newvalues, function(err, res) {
    if (err) throw err;
    console.log(res.result.nModified + " document(s) updated");
    db.close();
  });
});
```

Node.js MongoDB Limit

Limit the Result

To limit the result in MongoDB, we use the `limit()` method.

The `limit()` method takes one parameter, a number defining how many documents to return.

Example

Limit the result to only return 5 documents:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://localhost:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
  dbo.collection("customers").find().limit(5).toArray(function(err, result)
{
    if (err) throw err;
    console.log(result);
    db.close();
  });
});
```

Node.js MongoDB Join

Join Collections

MongoDB is not a relational database, but you can perform a left outer join by using the `$lookup` stage.

The `$lookup` stage lets you specify which collection you want to join with the current collection, and which fields that should match.

Example

Join the matching "products" document(s) to the "orders" collection:

```
var MongoClient = require('mongodb').MongoClient;
var url = "mongodb://127.0.0.1:27017/";

MongoClient.connect(url, function(err, db) {
  if (err) throw err;
  var dbo = db.db("mydb");
```

```
    dbo.collection('orders').aggregate([
      { $lookup:
         {
           from: 'products',
           localField: 'product_id',
           foreignField: '_id',
           as: 'orderdetails'
         }
       }
      ]).toArray(function(err, res) {
      if (err) throw err;
      console.log(JSON.stringify(res));
      db.close();
    });
  });
```