COMS/SE 319: Software Construction and User Interface
Fall 2018

LAB Activity 5 – Node.js

Task 1: Node.js

Learning Objectives:

- **Get started with Node.js**
- **run simple js programs on desktop**

What is nodejs?

- Javascript became very popular on browsers.
- node.js developers wanted to make javascript run on desktop.
- bundled javascript VM (google's V8) to allow one to create desktop programs in js.
- so now one can run js on desktop!
- Also -huge number of libraries exist.
- now one can easily create a web server using some of these libraries

Step 1: install nodejs

You can also install node onto the "U" drive on the lab computer, but not by using the official installer. Instead, http://nodejsportable.sourceforge.net/ or https://github.com/yjwong/nodejs-portable-runtime should work. They are basically downloading node.exe, node.liband npm.zip from the node.js website. If the above links do not work, navigate to http://nodejs.org/dist/latest/win-x64/ and download both node.exe and node.lib.

Step 2: run simple js code

- Create a file named addNumbers.js
- Write code to

  A) print a usage statement if arguments is less than two.

  B) assume that the arguments are a variable number of numbers. Print their sum.

- Use the following

console.log --- used to print to the terminal

process.argv --- an array of command line arguments

- Example usage:

  –node addNumbers.js (prints "usage: node addNumbers.js <<num1>> <<num2>> …")

  –node addNumbers.js 10 11 12 (prints "sum is 33")

Write down the Output of the given code in Canvas.

Step 3: play with arrays

- **Ref: https://www.w3schools.com/jsref/jsref_obj_array.asp**
- Create a file named playWithArrays.js
- Write code to

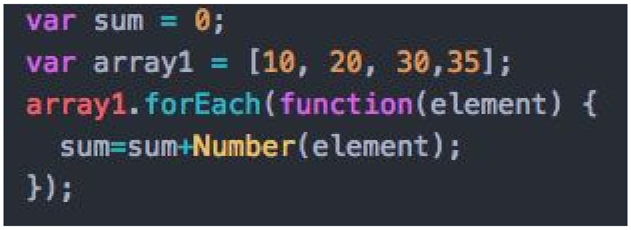
  A) take a series of numbers as command line argument.

  B) use the following array functions:

  - ❖ forEach (print the sum of numbers)
  - ❖ map (return an array with each number squared)
  - ❖ filter (return an array with only even numbers)
  - ❖ every (return true if all the numbers are even)
  - ❖ some (return true if some numbers are even)
  - ❖ reduce (return the sum of the numbers)

Example:

forEach for sum:



```
var sum = 0;
var array1 = [10, 20, 30,35];
array1.forEach(function(element) {
  sum=sum+Number(element);
});
```

Please Answer what will be the code for "some" and "every" in Canvas.

Task 2: Node.JS Callbacks

Learning Objectives:

- **Learn how to create our own modules --- that accept callbacks-**
- **No Coding Needed, just practice the below examples.**

Step 1: Create a reusable module (library)

- On the library side you will need

  module.exports = { <<properties you want to export>> };

  You can export as many properties as you want.

  These can be an object, function, array, string etc etc.

  Example: module.exports = {'name': "Tom", … }; // in myLib.js

- On the consumer of the library side you will need

  let var_name = require('./filename');

  var_name.<<property>> will give you access to the desired property.

  Example: let person = require('./myLib.js');

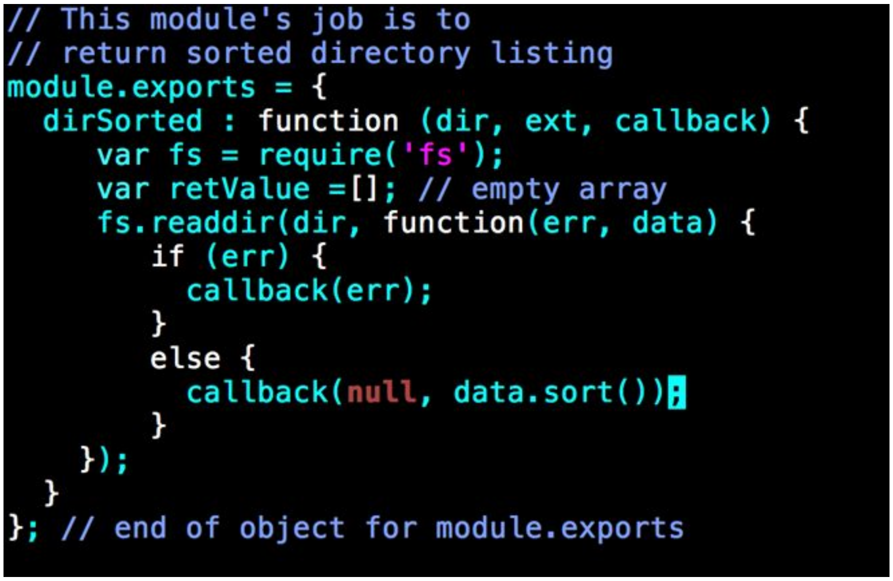
  console.log(person.name); // prints Tom

Step 2: Accept a callback

- A callback is just a function. For your module to accept a callback, all it has to do is to accept a function as a parameter. Inside your library code, you will call that function.

```
module.exports = {'reverse' : function(s, f) {…} };
    //assume s is a string and f is a function
    //assume f accepts two parameters, the first
          //one is error status and the second one is data
```

Step 3: Here's an example



```
// This module's job is to
// return sorted directory listing
module.exports = {
  dirSorted : function (dir, ext, callback) {
     var fs = require('fs');
     var retValue =[]; // empty array
     fs.readdir(dir, function(err, data) {
        if (err) {
          callback(err);
        }
        else {
          callback(null, data.sort());
        }
     });
  }
}; // end of object for module.exports
```

Note that we created a dirSorted function that can be used by anybody.

It accepts a callback. dirSorted calls the callback with the sorted directory listing. Note that here we use an async function fs.readdir. So, dirSorted is async too.