**Ctrl+shift+L – bullet shortcut**

Node

* ‘npm start’ runs ‘node server.js’ command.
* ‘npm –g install supervisor’ – this module auto restarts the server when changes are saved. Start server by ‘supervisor serjer.js’

Representational State Transfer:REST API

* REST is stateless- no idea of current user state or history.
* Abbreviation for application program interface, which enables applications to talk to each other.
* In MEAN, it is used to create a stateless interface to database, enabling a way for other applications to work with the data.

Problems with Single Page Application(SPA)

* Crawlability: js are difficult to crawl. Sols-1 have server create HTML-based version and deliver that to crawler. 2 use headless browser such as PhantomJS to run JS.
* Analytics integration: analyse the traffic, can be added using different APIs
* Speed of initial load: need to load the framework at least once and all the contents at the beginning. To overcome: use lazy loading.

Blog example

* Has two sides Blog entries- needs to be fast(pages changes instantly) and admin interface- needs to be interactive. Soln is to create admin interface with angularjs and blog entries with express & nodejs with angularjs for adding features.

**Prototype development stages:**

1. build static site
2. design data model and create database
3. build data API
4. hook database into the application
5. augment the application.

Express

* Express is a web application framework for no.

Package.json file

* In every node app there should be package.json in root folder.
* It contains metadata about the project including packages that it depends on.
* ‘npm install’ run It in same folder as package.json to install all the dependencies listed in the file.
* All packages are installed in node modules, inside subfolders and they all have package.json file each.
* To add more packages: ‘npm install –save package-name’ run it in the same folder as package.json.

**Express project**

* You will need: node &npm, express generator installed globally, git , heroku and terminal.
* Verify installation: express –version.
* 4 template engines available: Jade is default, EJS, JSHtml and Hogan.
* About Jade: no <> except for div, no tag means <div>. indented using spaces. E.g., #banner.page-header - # for id and . for class so it means id=”banner” and class=”page-header”

**Creating Express project:**

* Go to the project folder and type ‘express’-will create folders then go to folder where package.json is and enter ‘npm install’-installs dependencies
* Try it out: ‘npm start’ and in browser goto ‘localhost:3000’.
* **Nodemon** to auto restart the server when code changes. ‘npm install –g nodemon’ and go to the project folder and ‘nodemon’.
* In the root folder:
* Create new folder ‘app\_server’ and inside it-
* Move ‘views’ and ‘routes’ folders
* Create 2 more folders ‘models’ and ‘controllers’
* To let express know where ‘views’ have moved- open app.js and find the line

app.set(‘views’, path.join(\_\_dirname, ‘views’)); and change it to

app.set(‘views’, path.join(\_\_dirname, ‘app\_server’, ‘views’));

* To let express know where ‘routes’ is, in app.js find the lines

var routes = require(‘./routes/index’);

var users = require(‘./routes/users’);

And change them to –

var routes = require(‘./app\_server/routes/index’);

var users = require(‘./app\_server/routes/users’);

* **Separate controllers from routes** : in default express controllers are part of routes.
* Inside index.js in ‘routes’-

router.get(‘/’, function(req, res){

res.render(‘index’, {title:’Express’});

});

1) **in the same file but outside route**:

var homepageController = function(req, res){

res.render(‘index’, {title:’Express’});

then,

router.get(‘/’, homepageController);

2) **in separate file**:

‘exports’ make functions available to other files.

module.exports.index = function(req, res){

res.render(‘index’, {title:’Express’});

};

then in routes file

var ctrlMain = require(‘../controllers/main’);

router.get(‘/’. ctrlMain.index); //index is the function required.

* Using Bootstrap in the project
* download bootstrap and unzip
* create a new folder in express project called ‘bootstrap’ and copy the unzipped file.
* it also needs jQuery, download it and save it in public/javascripts.
* reference bootstrap.min.js, jquery in the ‘layout.jade’ file.
* delete /public/style.css file
* Heroku for deploying the server.
* Heroku needs to know the version of node and npm, so add following to package.json

“engines”:{

“node”: ”~4.2.1”, //current version “node –version”

“npm”: “~2.2.0”

},

* Create a Procfile:
* it tells how to start node app.
* in root folder create “Procfile”, no extension and enter “web: npm start
* Heroku comes with Foreman to test it locally before pushing it to Heroku. Stop the app first and enter ‘foreman start’. port is 5000.
* use git to push the app to Heroku.
* git init
* git add .
* git commit –m ‘first commit’
* Create Heroku App:
* ‘heroku create’
* git push heroku master
* web Dyno
* more dynos -> more resources for your app. good for big app
* ‘heroku ps:scale web=1’ and now the url is live.
* to view the app : ‘heroku open’
* to update use git.

**4 Building Static site with node and express**

**Creating routes**

* define all the routes in the index.js file as follows:

var ctrlLocation = require(‘../controllers/locations’);

var ctrlOthers = require(‘../controllers/others’);

router.get(‘/’, ctrlLocations.homelist);

router.get(‘./location’, ctrlLocations.locationInfo);

…

…

module.exports = router;

**Create Controllers**

* remove any default files in controllers folder that we don’t need.
* create others.js controller in the folder and add:

module.exports.about = fuction(req,res){

res.render(‘index’, {title: ‘About’});

};

* here ‘index’ is the view.

**Create Views**

**MongoDB**

Install mongodb: brew update && install mongoDB

mongod –version //check if installed properly

npm init //to start a new project

npm install mongodb - -save // to add dependencies

e.g.,

var MongoClient = require(‘mongodb’).MongoClient;

var connectionUrl = ‘mongodb://localhost:27017/myproject’,

sampleColleciton = ‘chapters’; //myproject db will be created.

//data to insert to db

var chapters = [{

‘title’ : snow crash’,

‘author’: ‘neal stephenson’

},{

‘title’ : snow crash’,

‘author’: ‘neal stephenson’

}];

MongoClient.connect(connectionUrl , function(err,db){

console.log(‘connected correctly’);

var collection db.collection(sampleCollection);

collection.insert(chapters, function(error, result){

if(!error){

console.log(‘success’);

}else{

console.log(‘error’);

}

db.close();

});

});

* save it as app.js
* ‘mongod’ to start the Mongodb demon
* node app.js to run the file.

Checking the db:

* mongo
* use myproject
* show collections // shows collections in db
* db.chapters.find().pretty() // displays db

Mongodb basics:

* mongo
* show dbs // show list of dbs
* use chapter3 // switched to db chapter3
* show collections // shows collections in that db

Inserting data to db

* db.newCollection.insert({name:’hem’, website:’lallu lallanwa’})
* db.newCollection.find().pretty() // shows the collection

Query

* db.newCollection.find({name:’hem’})
* db.newCollection.find({name:’hem’}, {name:true}) // returns only \_id and name
* db.newCollection.find({name:’hem’}, {name:true, \_id:false}) // returns only name
* db.homeword\_scores.find({score:{$gte:80,$lt:90})
* db.newCollection.find({name:{$regex:’hem’}})

Updating data

* db.newCollection.update({name:’hem’},{$set:{website:’pun’}})
* db.newCollection.update({name:’joe’},{name:’joe’,website:’dfds’},{upsert:true}) //if data does not exist, it add to db

Deleting data

* db.newCollection.remove({name:’joe;})
* db.newCollection.drop() // delete all data in a collection
* each entry in database is called a document
* collection of documents is a collection-like table
* definition of a document is schema
* data entity defined in a schema is a path.

Schema

it is a JS object.

{

firstname : {type:String, required:true},

surname : {type:String},

rating: {type: Number, “default”:0, min:0, max:5}

}

inside schema file:

require(Mangoose);

var locationSchema = new mangoose.Schema({ //schema goes here });

* nested schema is supported- openingTimes:[openingTimeSchema]

Compiling Mongoose schemas into models

mongoose.model(‘Location’, locationSchema, ‘locations’);

connectionName.model(nameOfModel,SchemaToUse,CollectionName(optional));

**Creating MongoDB database:**

>use Loc8r

>show dbs

>db.locations.save({

…..

)}

>show collections

>db.locations.find().pretty()

**Adding Mongoose to app**

* npm install –save mongoose //creates new mongoose folder in node\_modules and is added to dependencies

create db.js in app\_server/models. add var mongoose=require(‘mongoose’);

import it in app.js. ‘require(‘,/app\_server/models/db’);’

creating mongoose connection

database URI has following construct

mongodb://username:pasword@localhost:27027/database

server address/port/databasename

* add following to db.js

var dbURI = ‘mongodb://localhost/dbname’; // uname and pwd are optional

mongoose.connect(dbURI);

mongoose.connection.on(‘connected’,function(){

console.log(‘Mongoose connected to ‘ + dbURI);

});

* copy code from page 129 MEAN book for db.js

**installing modules using npm**

npm install express

var express = require(‘express’);

* installing module globally

npm install –g express // creates node\_modules directory in system directory

* npm install express - -save //dependencies- necessary for app
* npm install express - - save-dev //dev dependencies only necessary for development of app.

**REST API ()**

Representational State Transfer.

* collections in database has a set of API URLs.

**Request methods**

* POST : create a new data in database
* GET: read data from database
* PUT : update a doc in db
* DELETE : delete an object from db

API should return one of three:

* a JSON object containing data answering the request query
* a JSON object containing error data
* a null response

**Creating Routes**

* create file index.js in app\_api/routes
* To app.js file add

var routesApi=require(path to js file)

app.use(‘/api’, routesApi);

**setting up request methods in routes**

router.get(‘/location’, ctrlLocations.locationInfo);

router.post(‘/location’, ctrlLocations.locationsCreate);

**routes in page 169 of MEAN**

//locations e.g.,

router.get(‘/locations’,ctrlLocations.locationsListByDistance);

….

//reviews

router.post(‘/locations/:locationid/reviews’, ctrlReviews.reviewsCreate’);

router.get(‘/locations/:locationid/reivews/:reviewid’,ctrlReviews.reviewsReadOne);

…..

module.exports = router;

**Creating the controller**

* 2 files ‘locations.js’ and ‘reviews.js’ in app\_api/controllers folder

**Including the model**

var mongoose = require(‘mongoose’);

var Loc = mongoose.model(‘Location’);

**get method: read data from MongoDB**

* code in page 177 of MEAN