HW3 Programming: Your First Crowdfunding Site: Instructions

When you're ready to submit your solution, go to the assignments list.

Background

In this programming assignment we are going to build and deploy an extremely simple crowdfunding site. The site will not actually be able to accept orders yet, but will be on the web. It will be written in basic HTML and CSS, and the presence/absence of particular HTML tags will be scored with an SSJS `grader.js` script.

The process will expose you to the mechanics of editing and deploying code in a Linux development environment. You will also learn the basics of writing simple command line applications in node.js. Note again that all assignments assume you are running code on AWS on a EC2 t1.micro instance running Ubuntu 12.04.2 LTS, unless otherwise specified.

This is the first step towards our final project. As noted in the syllabus, you will be graded on the technical aspects of this process (presence and absence of HTML tags, correctness of JSON output), but it is the qualitative aspects that your customers will ultimately take into account.

Part 1: Deploy some basic HTML edits

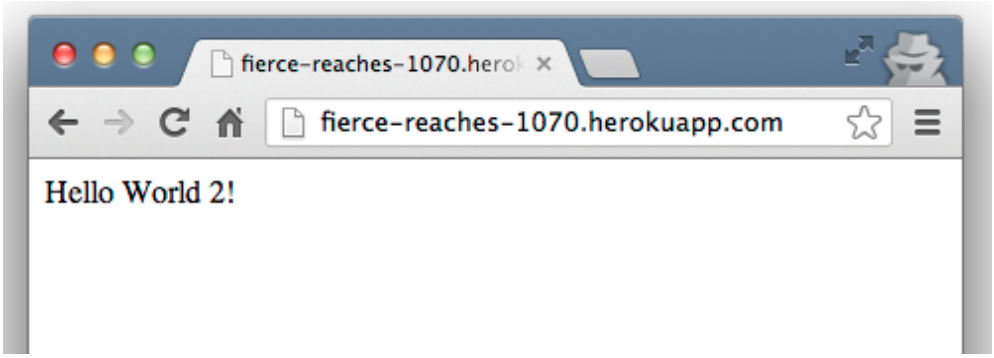
In this part we will modify the deploy from this lecture to read in an HTML file. This is meant to put together much of the content from Lectures 2-4, from heroku to emacs to git to github.

1. First, fork (or duplicate) the `node-js-sample` repository that you deployed in this lecture into your own Github account.
2. Rename it to `bitstarter` by going to the settings URL, which will be like `https://github.com/startup-class/node-js-sample/settings`, except with your own username rather than "startup-class")
3. Next, redo the deploy with this new `bitstarter.git`, such that you again get a Hello World site, as shown below.

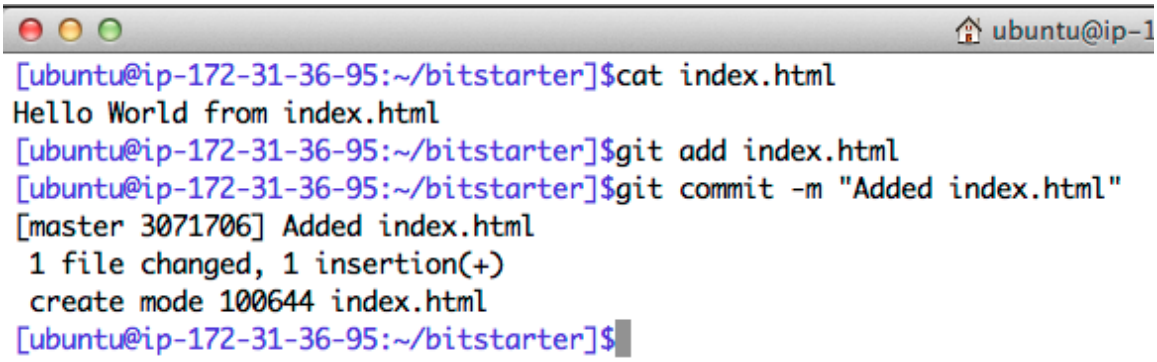
4. Now use `emacs` to edit the relevant line in `bitstarter/web.js` to become "Hello World 2!"; here's the file of interest:

```
[ubuntu@ip-172-31-36-95:~/bitstarter]$cat web.js
var express = require('express');

var app = express.createServer(express.logger());

app.get('/', function(request, response) {
  response.send('Hello World!');
});

var port = process.env.PORT || 5000;
app.listen(port, function() {
  console.log("Listening on " + port);
});[ubuntu@ip-172-31-36-95:~/bitstarter]$
```

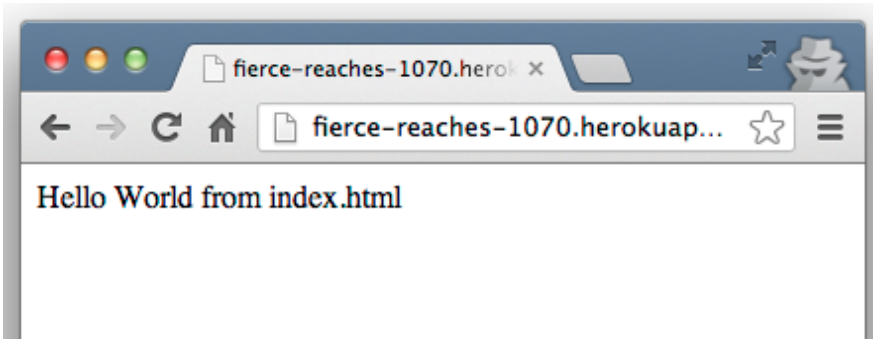
5. Then execute `git add web.js; git commit -m "Updated web.js"` after you make the edit (see here and here to refresh). Finally, redo the deploy. You should see something like this:



6. Now create a file named "index.html" with the string "Hello World from index.html" in it, and `git add` it to the repo, as shown. From this point forward we won't remind you to `git add` all the time.



7. Next, look at fs.readFileSync, the Buffer.toString, and this article. Modify `web.js` again, except this time have it read "index.html" from disk and use that data in place of "Hello World 2!". Now redo the deploy. You should see something like this:



8. Finally, do `git push origin master` to push your commits to your Github account. This is different from `git push heroku master` which actually deploys the code to Heroku.

Submit: Submit a comma-delimited file with your github repo URL and your Heroku URL. It should have one line and look like this:

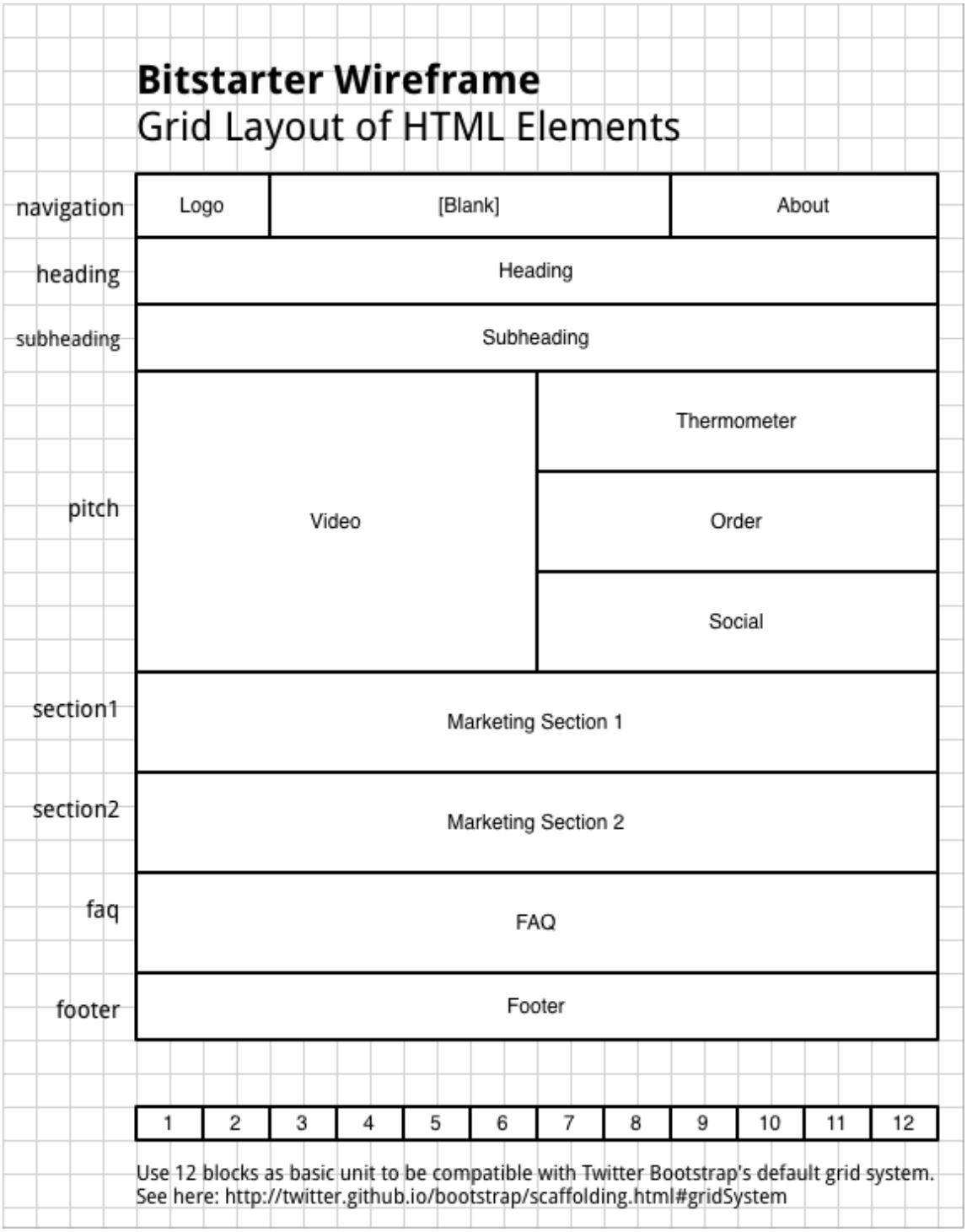
```
http://github.com/startup-class/bitstarter, http://fierce-reaches-1070.herokuapp.com
```

Part 2: Wireframe and Edit HTML/CSS

Now we are going to modify the deploy to get up a first cut of our bitstarter website.

1. Begin by taking a look at the websites for Selfstarter, Lockitron, and the Light Table project on

Kickstarter. We have isolated a few common elements of these sites in this wireframe:



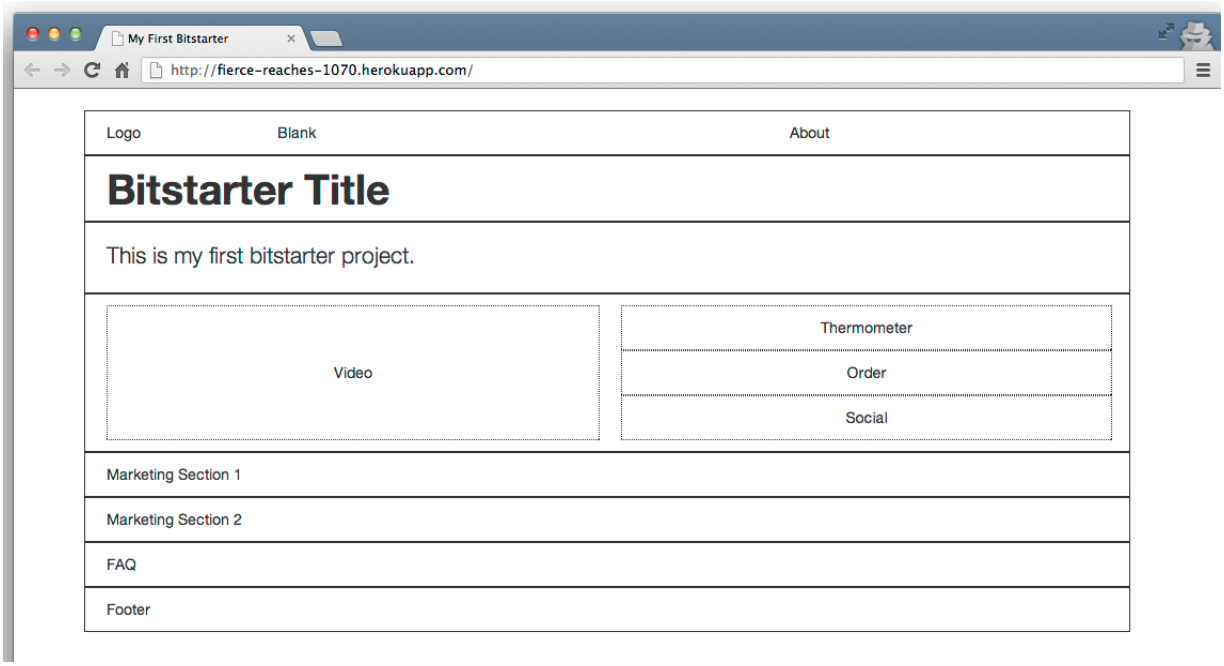
2. Our first step is to lay this out in HTML. Use `emacs` to modify `bitstarter/index.html`, literally typing in the file shown in these images.
   - NOTE: it's ok if you don't fully understand the code. In a nutshell, we're pulling in Twitter Bootstrap and defining some CSS styles in the `head`. Then we are laying out a series of `div` elements. By doing this out manually you'll have a greater appreciation and a point of reference for when we cover HTML/CSS theory.
   - NOTE ALSO: We know that typing it in is a pain, but in doing so you pay much more attention to detail than when simply copy/pasting; see Zed Shaw. This will also give you practice editing a file in emacs. (That said, if and only if you have accessibility issues and actually can't type from a screenshot, you can start with the file here.)

`index.html`

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <title>My First Bitstarter</title>
    <link type="text/css" rel="stylesheet"
          href="https://d396qusza40orc.cloudfront.net/startup%2Fcode%2Fbootstrap-2.3.2.css">
    <style type="text/css">
      body {
        padding-top: 20px;
        padding-bottom: 40px;
      }
      .container {
        width: 960px;
      }
      p.lead {
        padding-top: 15px;
      }
      .navigation, .pitch, .section1, .section2, .faq, .footer {
        padding: 10px 0px 10px 0px;
      }
      .video, .thermometer, .order, .social {
        border: 1px dotted;
        text-align: center;
      }
      .video {
        /* Internal borders have 1px width, thus need to add 4 x 1px to 120px. */
        height: 124px;
        line-height: 124px;
      }
      .thermometer, .order, .social {
        /* line-height to vertically center: http://phrogz.net/css/vertical-align/index.html */
        height: 40px;
        line-height: 40px;
      }
      div.row {
        border: 1px solid;
      }
    </style>
  </head>
  <body>
    <div class="container">
      <div class="row navigation">
        <div class="span2 logo">
          Logo
        </div>
        <div class="span6 blank">
          Blank
        </div>
        <div class="span4 about">
          About
        </div>
      </div>
      <div class="row heading">
        <div class="span12">
          <h1>Bitstarter Title</h1>
        </div>
      </div>
     <div class="row subheading">
        <div class="span12">
          <p class="lead">This is my first bitstarter project.</p>
        </div>
      </div>
      <div class="row pitch">
        <div class="span6 video">
          Video
        </div>
        <div class="span6">
          <div class="thermometer">
            Thermometer
          </div>
```

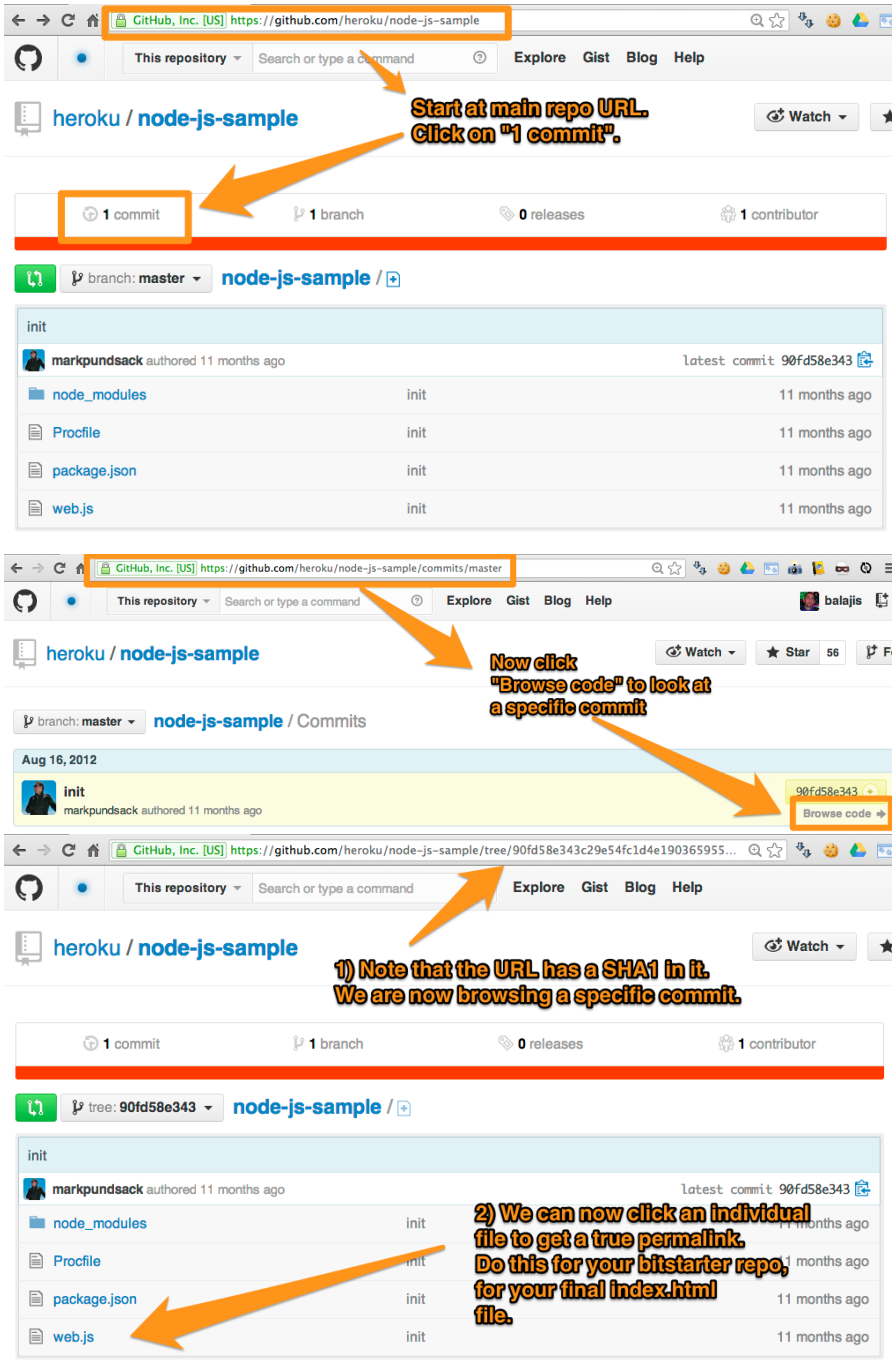
```
72          <div class="order">
73            Order
74          </div>
75          <div class="social">
```

3. Commit your changes along the way and periodically do `git push origin master`. You can preview the `index.html` file by using `scp` or `rsync` to copy it locally and then using Chrome to look at it. Or you can use rawgithub, which is even more convenient.
4. When you finish and do `git push heroku master` it should look like this:



Great job. You now have a simple v1 crowdfunder up. You can edit the text further to start figuring out what you want to market. As noted in the first lecture, the text (aka marketing copy) that you write within the HTML tags will not be graded, but will serve to promote your crowdfunder.

Submit: Submit the permalink to your final `index.html` file in your github repository by using the github.com web UI. See below:



So, you should submit a URL that looks something like this:

```
  https://github.com/YOUR-USERNAME/bitstarter/blob/90fd58e343c29e54fc1d4e1903
6595500b2bdc21/index.html
```

It should NOT look like this with master in the URL:

```
https://github.com/YOUR-USERNAME/bitstarter/blob/master/index.html
```

See here for more details; in short the "master" URL will keep changing as you make more commits, so it won't always point to the same data. The link with the SHA1 hash in it will not have that

problem.

Part 3: Write SSJS headless grader

- Now that you have an extremely basic crowdfunding site up and running, we are going to write a simple node.js command line application which takes your crowdfunding URL as an input and returns a list of boolean flags in JSON format that check for the presence of HTML tags.
- Use `npm` at the command line to install two new node libraries, like we did last time with restler:

```
$ npm install cheerio
$ npm install commander
```

- We are going to call this script `grader.js`. Start with the following skeleton. Note that we are using a new node.js library for developing a command line application, and that we express the main routine as a function of the arguments given on the command line.
- You should read the code closely and use the emacs SSJS REPL to interact with it and figure out what the snippets do. In particular, reading a bit about JSON (1, 2) may be helpful.

grader.js

```
#!/usr/bin/env node
/*
Automatically grade files for the presence of specified HTML tags/attribut
es.
Uses commander.js and cheerio. Teaches command line application developmen
t
and basic DOM parsing.

References:

 + cheerio
   - https://github.com/MatthewMueller/cheerio
   - http://encosia.com/cheerio-faster-windows-friendly-alternative-jsdom/
   - http://maxogden.com/scraping-with-node.html

 + commander.js
   - https://github.com/visionmedia/commander.js
   - http://tjholowaychuk.com/post/9103188408/commander-js-nodejs-command-
line-interfaces-made-easy

 + JSON
   - http://en.wikipedia.org/wiki/JSON
   - https://developer.mozilla.org/en-US/docs/JSON
   - https://developer.mozilla.org/en-US/docs/JSON#JSON_in_Firefox_2
*/

var fs = require('fs');
var program = require('commander');
var cheerio = require('cheerio');
var HTMLFILE_DEFAULT = "index.html";
```

```
var CHECKSFILE_DEFAULT = "checks.json";

var assertFileExists = function(infile) {
    var instr = infile.toString();
    if(!fs.existsSync(instr)) {
        console.log("%s does not exist. Exiting.", instr);
        process.exit(1); // http://nodejs.org/api/process.html#process_pro
cess_exit_code
    }
    return instr;
};

var cheerioHtmlFile = function(htmlfile) {
    return cheerio.load(fs.readFileSync(htmlfile));
};

var loadChecks = function(checksfile) {
    return JSON.parse(fs.readFileSync(checksfile));
};

var checkHtmlFile = function(htmlfile, checksfile) {
    $ = cheerioHtmlFile(htmlfile);
    var checks = loadChecks(checksfile).sort();
    var out = {};
    for(var ii in checks) {
        var present = $(checks[ii]).length > 0;
        out[checks[ii]] = present;
    }
    return out;
};

var clone = function(fn) {
    // Workaround for commander.js issue.
    // http://stackoverflow.com/a/6772648
    return fn.bind({});
};

if(require.main == module) {
    program
        .option('-c, --checks <check_file>', 'Path to checks.json', clone(
assertFileExists), CHECKSFILE_DEFAULT)
        .option('-f, --file <html_file>', 'Path to index.html', clone(asse
rtFileExists), HTMLFILE_DEFAULT)
        .parse(process.argv);
    var checkJson = checkHtmlFile(program.file, program.checks);
    var outJson = JSON.stringify(checkJson, null, 4);
    console.log(outJson);
} else {
    exports.checkHtmlFile = checkHtmlFile;
}
```

`checks.json`

This is the *initial* checks.json file. You will modify this to add more checks (see below).

```
["h1",
 ".navigation"]
```

Sample usage

Here is a sample use case.

```
[balajis@jiunit:~]$head -n3 index.html
<!DOCTYPE html>
<html lang="en">
  <head>

[balajis@jiunit:~]$cat checks.json
["h1",
 ".navigation"]

[balajis@jiunit:~]$./grader.js --checks checks.json --file index.html
{
    ".navigation": true,
    "h1": true
}
```

Modify this script as follows:

1. First, add the initial versions of `grader.js` and `checks.json` to the same `bitstarter` github repo and do `git add, git commit, git push`.
2. Update `checks.json` to include checks for all the following classes in the wireframe. Here's the list of checks; make sure to encode as JSON in `checks.json`.

   ```
   h1
   .navigation
   .logo
   .blank
   .about
   .heading
   .subheading
   .pitch
   .video
   .thermometer
   .order
   .social
   .section1
   .section2
   .faq
   .footer
   ```

You can probably figure out how to encode these in checks.json from context, but in a bit more detail: The idea here is that in the `checkHtmlFile` function, with the current `checks.json` we are only confirming that there is at least one `<h1>` tag (see here) and at least one HTML element with a `.navigation` CSS class (see here) in our `index.html` document. However, we want to test that the `index.html` file also has `.thermometer`, `.pitch`, and all the other classes depicted in the wireframe. So we need to add more rules to `checks.json`. (This really isn't a hard problem; just explaining what the idea is). We'll cover HTML/CSS in far greater detail soon, but try messing around with cheerio in your Emacs node REPL to get a sense of how this testing process works programmatically.

3. Update `grader.js` to take either a file or a URL as an input on the command line. Use the restler library from the previous HW to download the URL. Your final output should look like this, except it should include all the checks and not just the one for `navigation`.

```
[balajis@jiunit:~]$./grader.js --checks checks.json --url http://fierce
-reaches-1073.herokuapp.com
{
    ".navigation": true,
    "h1": true
}
```

Submit: Submit the JSON output from running it on your sample URL (Output Submission) and your revised `grader.js` (Additional Submission). Yes, we know there are ways you can game this, but we're trying to be nice :) However, we'll look into setting up external automated graders for the next assignment.

Hints and Tips

Here are some sample files to help in your debugging.

```
$ wget https://spark-public.s3.amazonaws.com/startup/data/hw3/test.tar.gz
$ tar -xzvf test.tar.gz
$ cd test
$ wget https://spark-public.s3.amazonaws.com/startup/code/grader.js
$ chmod u+x grader.js
```

Then execute the following commands

```
$ ./grader.js -c checks-test-1.json -f test1.html
{
    ".navigation": false,
    "h1": true
}

$ ./grader.js -c checks-test-1.json -f test2.html
{
    ".navigation": true,
    "h1": true
}
```

```
$ ./grader.js -c checks-test-2.json -f test1.html
{
    "div div div h1": true,
    "div div.subheading": true,
    "div.footer": true,
    "title": true
}

$ ./grader.js -c checks-test-2.json -f test2.html
{
    "div div div h1": true,
    "div div.subheading": false,
    "div.footer": false,
    "title": true
}
```