Csci 4131 Internet Programming Spring 2021 Final Project

A guide to deploying your full stack application from Homework 6 or Homework 7 To Heroku

Due Date: Monday May 10th at 11:59pm

No Late Submissions Accepted

Heroku is a platform as a service (PaaS) that enables developers to build, run, and operate applications entirely in the cloud. The objective of this project is to enable you to deploy a full stack application that you created on a platform where it can be accessed and used by anyone with internet access!

This task is part of your final project for Csci 4131. You can find a specification of the final project options at the top of the class Canvas site in the Resources Module. Read all of the instructions carefully before starting to attempt this project.

1.) To create a new Heroku application for your website:

Sign up for Heroku and create a new application for your website. You can accomplish that using the Heroku dashboard on the webpage found at the following link:

https://dashboard.heroku.com/apps

or by using the Heroku Command Line Interface (CLI) tool on your local machine. For information on how to use the Heroku CLI, see the information at the following link:

https://devcenter.heroku.com/articles/getting-started-with-nodejs?singlepage=true

You should include following name in your Heroku application as follows :
`hw6-yourX500id` *or*
`hw7-yourX500id`

Where you specify the Homework you are porting to Heroku (**`hw6`** or **`hw7`**) and replace: **`yourX500id`** with your x.500 id – for example: **`hw6-chal0006`**. This is case sensitive, so ensure it is all lowercase.

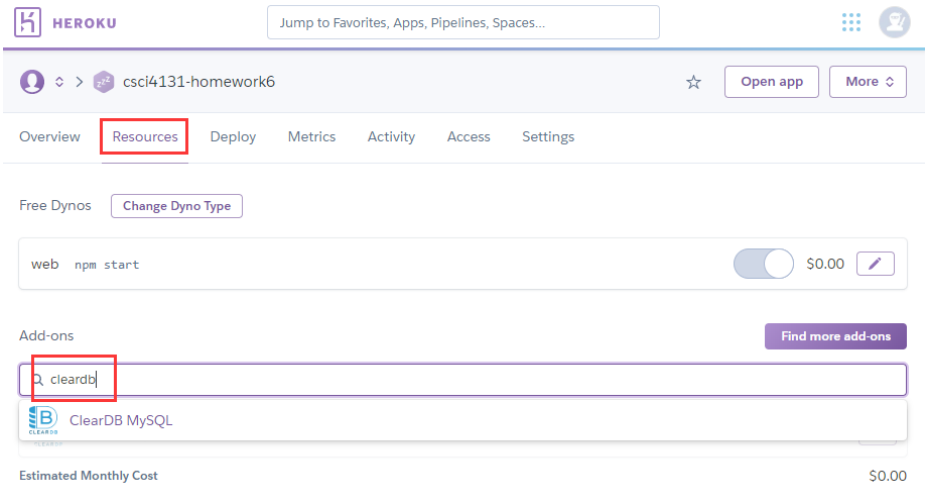
2. Add MySQL service to your Heroku application

Now you need to add database service to your application on Heroku.

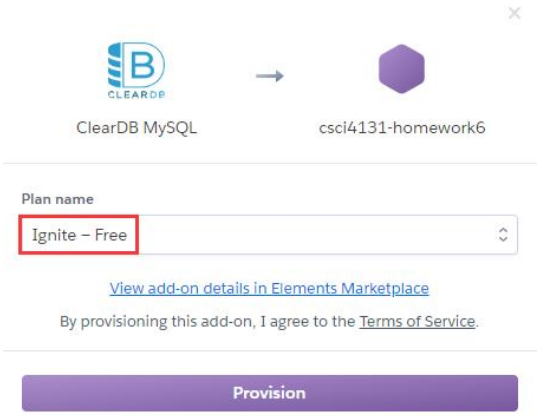
Since we used MySQL as our database for Homework 6 and Homework 7, you need to activate the add-on “ClearDB MySQL”. You can accomplish this using either the dashboard of your application or the Heroku CLI tools.

You may be asked to verify your billing information even though we only need the free version.

If you want to configure add-ons on the **application dashboard**:
Click the “resources” tab and search for the add-on “cleardb” or “mysql”.



Select the free version and activate it (see figure at the top of page 3)



If you want to configure your application using **Heroku CLI tools**, you can follow the official tutorial:

https://devcenter.heroku.com/articles/cleardb

3. Get your code (the is your working version of Homework 6 or Homework 7) ready to deploy to Heroku :

a. Configure the Node.js development environment on your local machine (that is, your desktop or laptop). Deploy the website in your homework 6 on your local machine and ensure that your website works properly in the local environment. We will port your website from the local machine to Heroku afterwards. We highly recommend you do this step on your local machine instead of the lab machine since that can give you more freedom to install additional software. However, you can use the CSE lab machines if you do not have node.js on your local machine.

b. Install the Heroku CLI tools on your local machine: https://devcenter.heroku.com/articles/heroku-cli

c. Update the database configuration in your code. You can run the following command to get the database configuration:

```
heroku config -a your_application_name
```

The command will return a database connection **url** in the following format:

```
mysql://username:password@host_name/database_name
```

Save the information returned!

You need to replace the MySQL configuration in your Homework with the new configuration information returned by the Heroku command you ran above.

To accomplish this, you need to edit **`create_accounts_table.js`**, **`create_contact_table.js`**, **`insert_into_accounts_table.js`**, and **`index.js`** to use the username, password, host_name, and database name information returned by the heroku command:

```
heroku config -a your_application_name
```

d. After you have updated all the files listed in step c above, you need to initialize the database. Follow the “Database setup” section in homework 6 instructions using the files updated with the heroku database information.

e. After database initialization, you need to update your server code to enable it to accept a port number from the environment. Change the code

```
app.listen(port, () => console.log('Listening on port', port));
```

to *(continued at the top of the next page)*

```
app.listen(process.env.PORT || port,

        () => console.log('Listening...'));
```

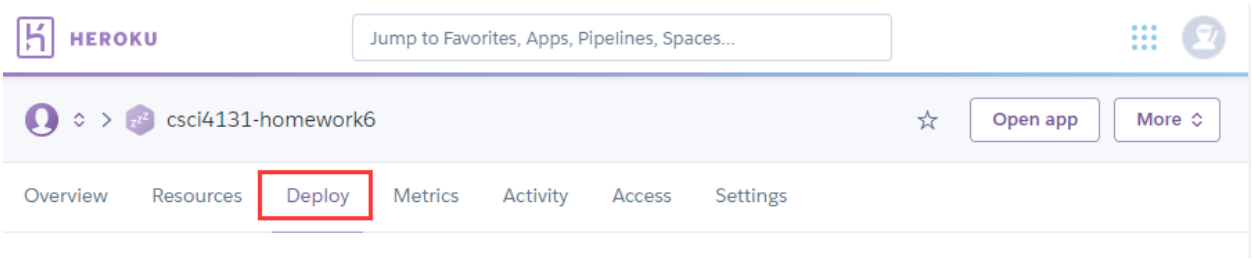
f. The last step to port your code is to add an entry to **`package.json`** so that Heroku can start your application automatically. You need to add a "**`start`**" entry to the "**`scripts`**" section in the **`package.json`**:

```
"scripts": {
  "test": "echo \"Error: no test specified\" && exit 1",
  "start": "node index.js"
},
```

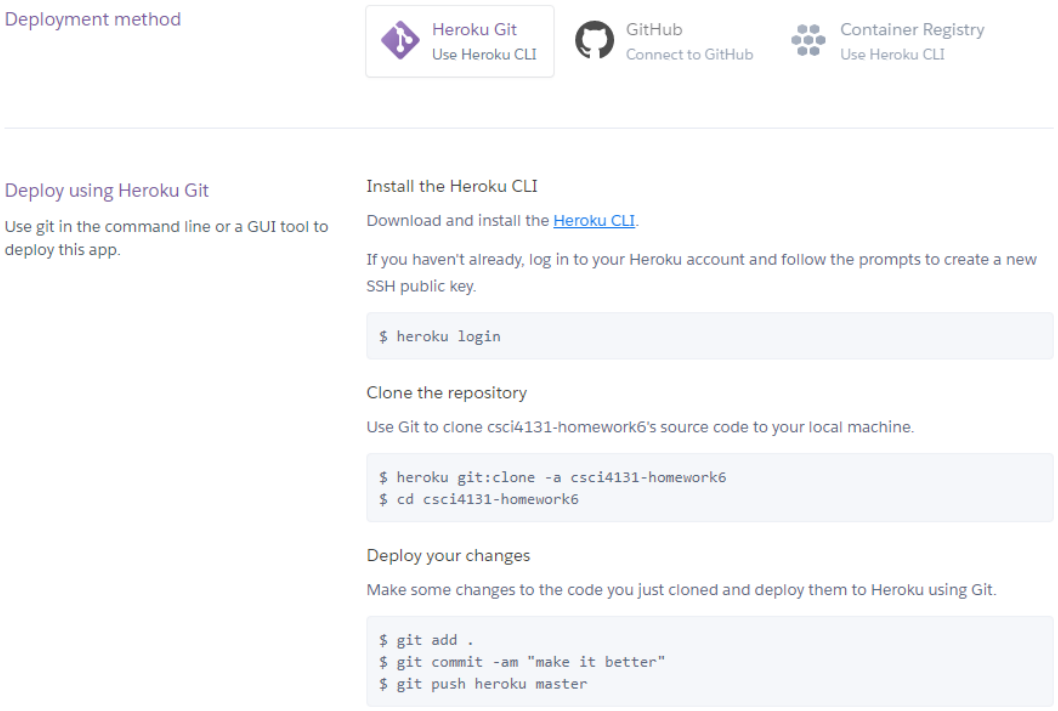
4. Deploy your application to Heroku:

i. Before deployment, you need to remove your node_modules folder. You can create a file called **`.gitignore`** and add one line **`node_modules/`** to this file to skip pushing these modules to Heroku.

ii. Open your application dashboard and switch to the "Deploy" tab.



iii. There are several methods to deploy your website:



We highly recommend you use Heroku CLI to deploy your website. If you want to use Github, you may use the private repository or some other method to avoid the exposure of your database credentials.

iv. If you want to debug your Heroku application online, especially when the application crashes, you can get the latest logs by running the command:

```
heroku logs --tail
```

Some issues you may encounter:

(1) If your application sometimes crashes because of “MySQL connection lost”, you may update your code to use MySQL connection pool instead of only one connection from the beginning:

```
var dbConn = mysql.createPool({
  connectionLimit: 100,
  host: "xxxx",
  user: "xxxx",
  password: "xxxx",
  database: "xxxx",
  port: 3306
});
```

Below are some more links that provide information about this error and MySQL connection pool:
https://stackoverflow.com/questions/18433124/heroku-and-nodejs-mysql-connection-lost-the-server-closed-the-connection
https://stackoverflow.com/questions/37102364/how-do-i-create-a-mysql-connection-pool-while-working-with-nodejs-and-express

(2) Sometimes the deployment doesn't work. You may wait a few minutes and try it again since there might be a rate limiter to stop you from deploying your application too quickly.

Other materials that may be helpful:

https://www.jackfranklin.co.uk/blog/hosting-a-node-app-on-heroku/
https://scotch.io/tutorials/how-to-deploy-a-node-js-app-to-heroku
https://bezkoder.com/deploy-node-js-app-heroku-cleardb-mysql/

Submission Instructions:

You must include a file named **`README`** in a text format: plain text, markdown, org-mode, etc. It should not be a word document or pdf.

The **`README`** should contain

(1) The Homework assignment you have ported to Heroku (HW6 or HW7)

(2) The url for your site on Heroku. It should be the name of your project. For example, for Professor Challou doing HW6, it would be:

`https://hw6-chal0006.herokuapp.com`

If, for some reason, your url differs from this, make sure to record it.

(3) At least one login and password that will enable us to log into your site to test it.

Failure to include the information above may result in you receiving no credit on this assignment.

Rubric:

We will follow that same rubric for grading this assignment as the one specified in the rubric for Homework 6 or Homework 7 (whichever you choose to do) – the assignment should function the same when deployed on the Heroku site as it on the CSE Labs computers.

Assignment Guidelines and Penalties – we reserve the right to grade subjectively.

1. The illustrations in the lab assignments and demos, though not stated, are implied requirements - though the style can differ, it shouldn't cause your output to look worse than the example given. Therefore, though the CSS and page elements can vary but they should function the same as illustrated in the assignment write-up and demos, and by our judgment, they should not negatively impact the functionality described in the write-up and demos.

2. Unless stated otherwise, for assignments that build on previous assignments, the functionality developed in the previous assignment should still work correctly.

Please follow these guidelines while working on your assignments. Failure to do so may result in penalties assessed against your score that are not explicitly stated in the rubric.