Homework #7 Google Cloud Platform

This semester we are allowing all students to explore cloud computing as offered by the Google Cloud Platform. Using the instructions below one can establish a website using Google App Engine. Once established, you will be able to move your PHP program developed for Assignment #6 to your Google App Engine website and have it execute there.

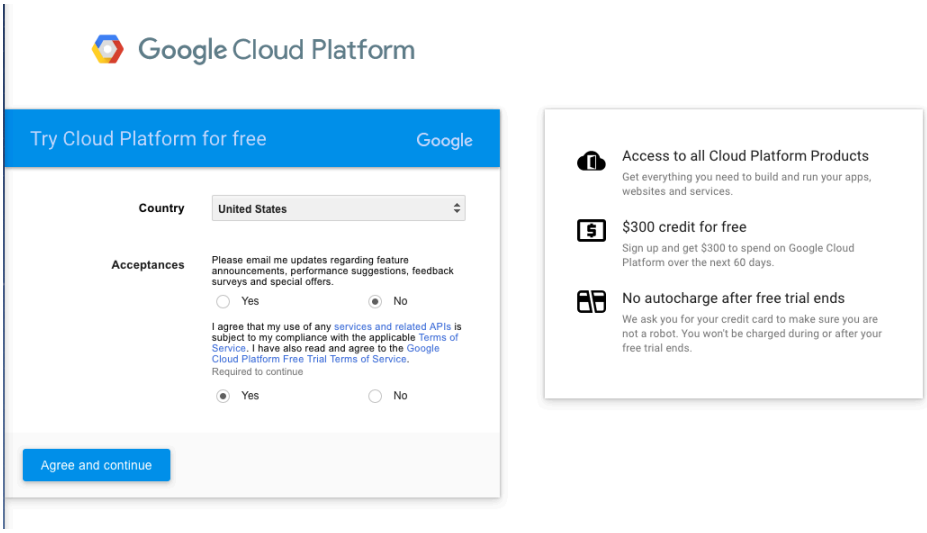
1. Sign up for Google Cloud Platform

To sign up for the Free Trial, with a $300 credit, you need a credit card. Unfortunately, an American Express or other pre-paid Gift card will not work with Google Cloud.

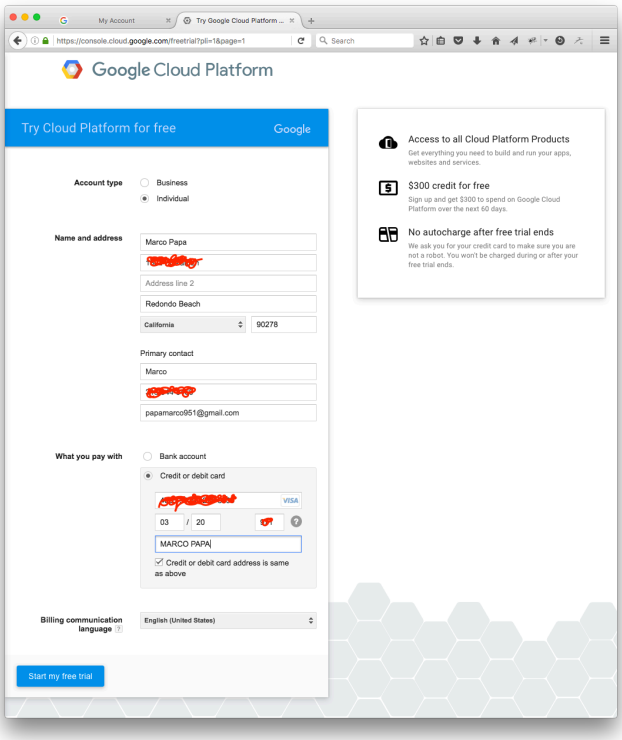
To sign up go to:

https://console.cloud.google.com/freetrial?pli=1&page=0

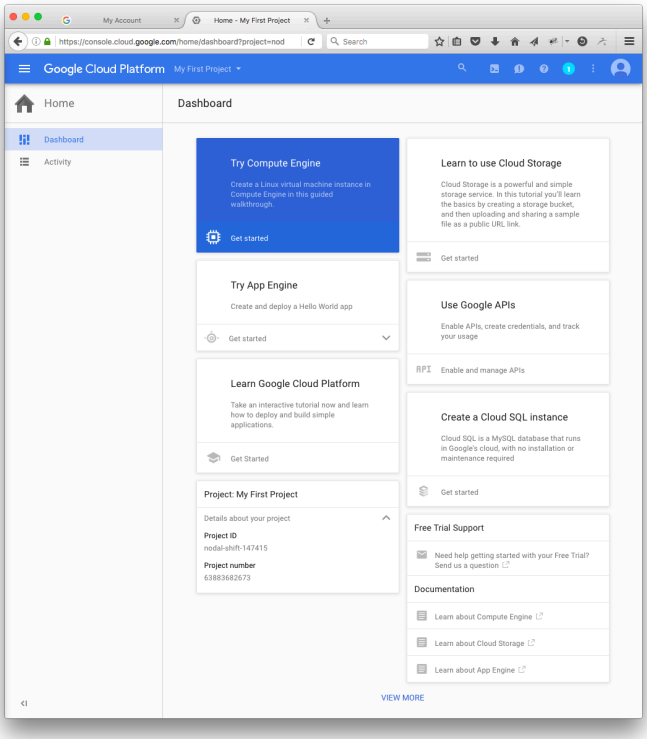
In the Try Cloud Platform for free page, select that you "agree to use the services" and click on **Agree and continue**.



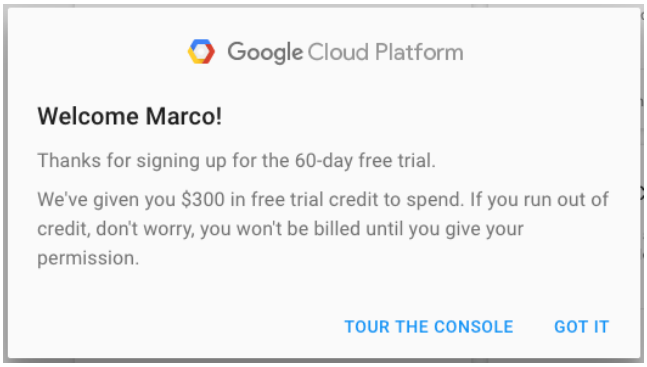
Select **Account Type Individual**. Follow the instructions to enter your account data. You should not be using your @usc.edu e-mail account for your primary contact e-mail address, but instead use your @gmail.com address and finish by clicking **Start my free trial**. You will have to provide a credit or debit card.



After you are signed up, you will see the message “Creating project. This may take a few moments”.” You will then be redirected to the **Dashboard** of the **Google Developer Console**.



A message will pop up indicating your you signed up for the 60-day free trial, and have been given a $300 free trial credit.



If you previously developed any projects using Google APIs, you will find them listed.

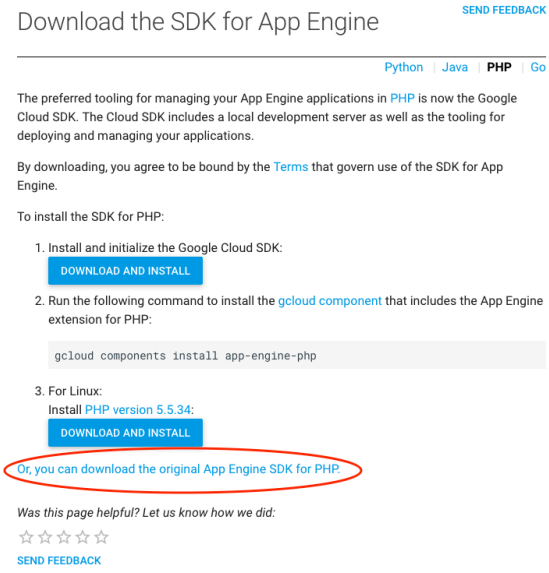
2. Download the App Engine SDK for PHP

The **Google App Engine SDK for PHP** is available for Windows, Mac OS X and Linux platforms.

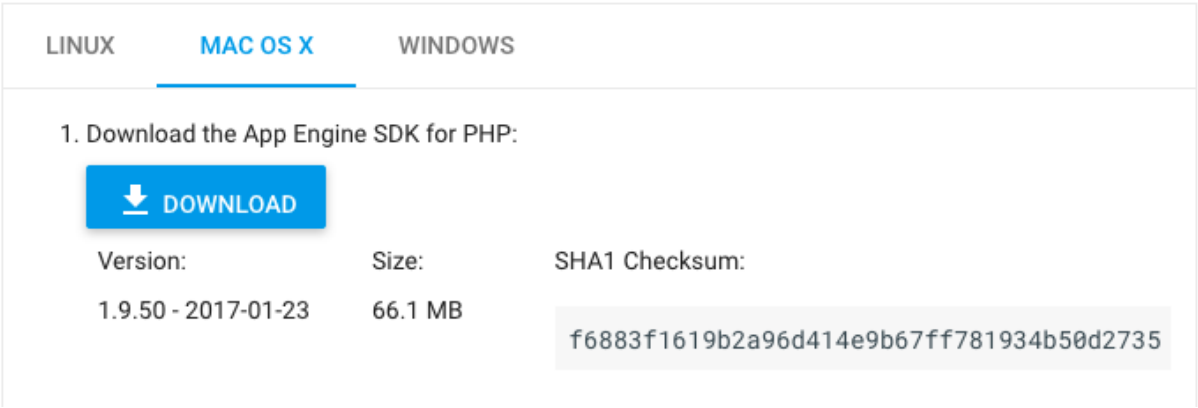
Go to the URL:

https://cloud.google.com/appengine/downloads/#Google_App_Engine_SDK_for_PHP

Click the **PHP button**. You will be redirected to the "**Download the SDK for App Engine**" page. Click on "**Or, you can also download the original App Engine SDK for PHP**," as highlighted in the picture below.



After you click on the hyperlink, a new section will appear below with LINUX, MAC OS X and WINDOWS tab installations. Select your platform tab.



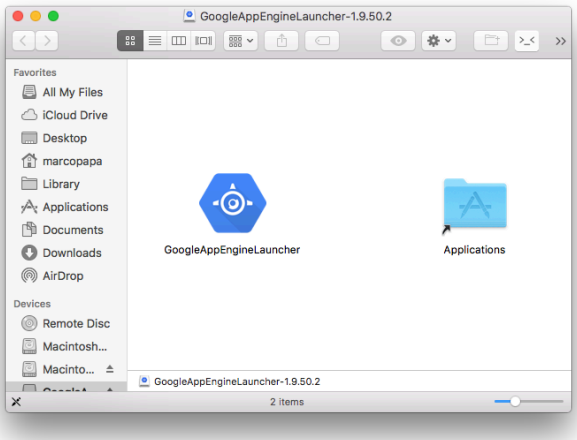
Click the **DOWNLOAD** button to download the package for your Platform to your local machine. The rest of this installation will show the steps needed for installing the SDK on the Mac OS X and Windows platforms.

3. Install the App Engine SDK for PHP

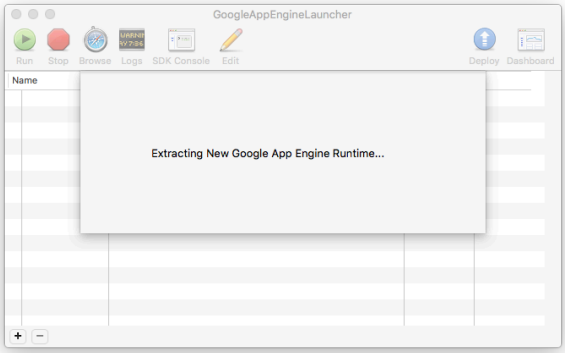
Installing on Mac OS X

To install the SDK on Mac OS X:

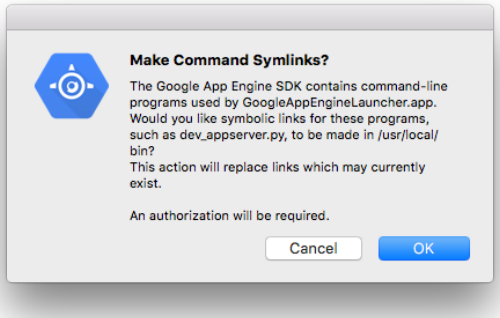
1. In the Finder, click **Go > Downloads** to open the Downloads folder.
2. Double click the App Engine SDK file you downloaded (*GoogleAppEngineLauncher-1.9.50.dmg*) to open it, then drag the **GoogleAppEngineLauncher** icon over to the Applications folder. You can now "eject" the volume GoogleAppEngineLauncher-1.9.50.2.



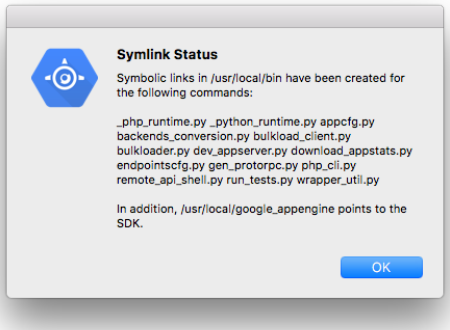
3. Double-click **GoogleAppEngineLauncher** in the Application folder.



4. When prompted to *Make Command Symlinks*, click **OK**. The symlinks allow you to run important SDK command-line tools in any terminal window.



> **Important:** The GoogleAppEngineLauncher is a convenient UI-based tool for running and deploying App Engine apps, but it *does not* provide all the features you'll need. You will need to use the command-line equivalent, appcfg.py, for many of the features you'll want to use.



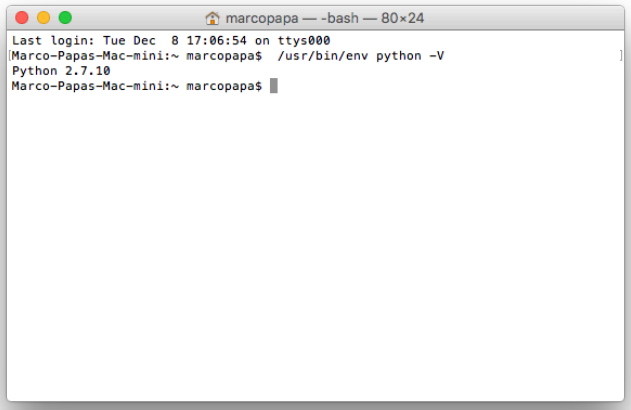
5. Notice that the installation process above unpacks the contents of the App Engine SDK at the location:

```
/usr/local/google_appengine
```

6. The App Engine PHP SDK requires Python 2.7, which is installed by default on Mac OS X 10.6 (Lion) or later. Verify your Mac's Python installation using the following command:

```
  /usr/bin/env python -V
```

   If the output looks like Python 2.7.<number> then you already have the correct Python version installed. Otherwise you can download and install Python 2.7 from the Python web site. If you are using Mac OS X Sierra, you will have Python 2.7.10, as shown below:



Installing on Windows

To install the SDK on Windows:

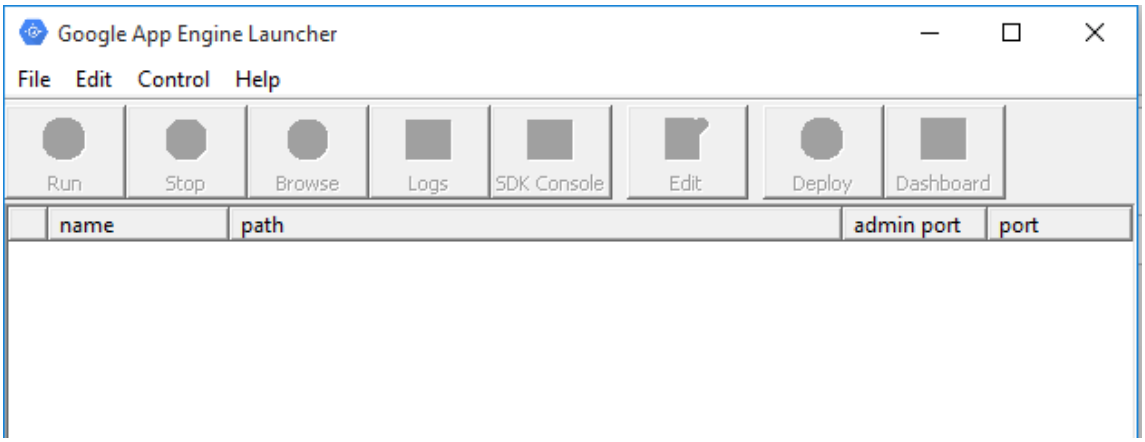
1. Double-click the SDK file you downloaded (*GoogleAppEngine-1.9.50.msi*) and follow the prompts to install the SDK.
2. You will need Python 2.7 to use the App Engine PHP SDK, because the Development Server is a Python application. Download Python 2.7.5 (don't use a higher version) from the Python web site.

> **Note:** The PHP SDK includes binaries for the PHP 5.4 runtime, including all enabled extensions, so there is no need to download PHP separately for the purposes of developing with App Engine -- you just need Python.

4. Create application using GoogleAppEngineLauncher

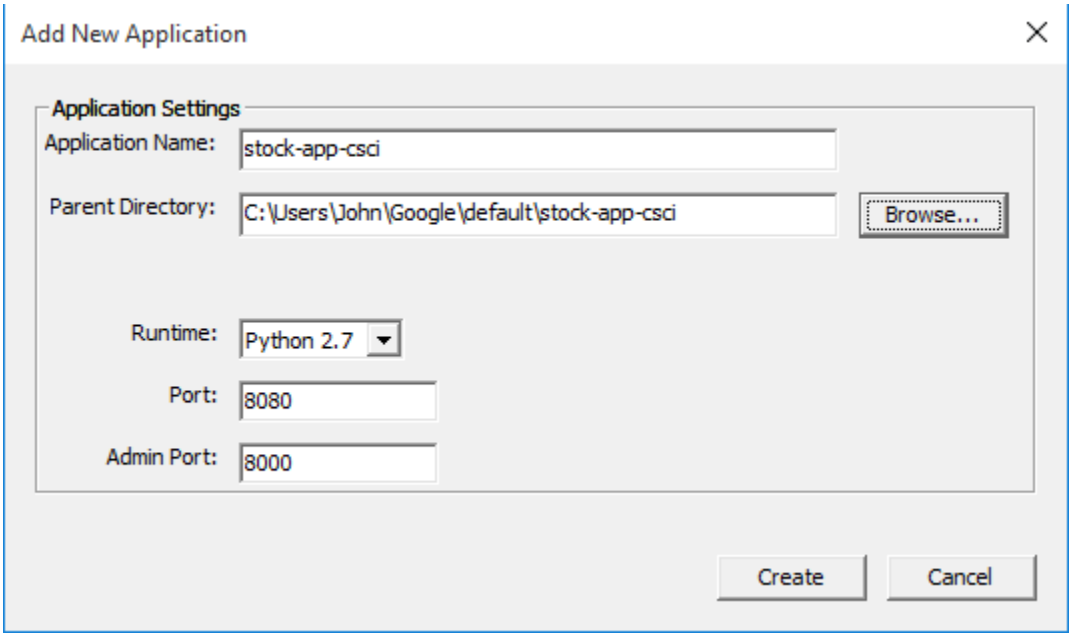
You can use the Google App Engine Launcher, which is installed as part of the App Engine SDK for PHP.

Run the Google App Engine Launcher:

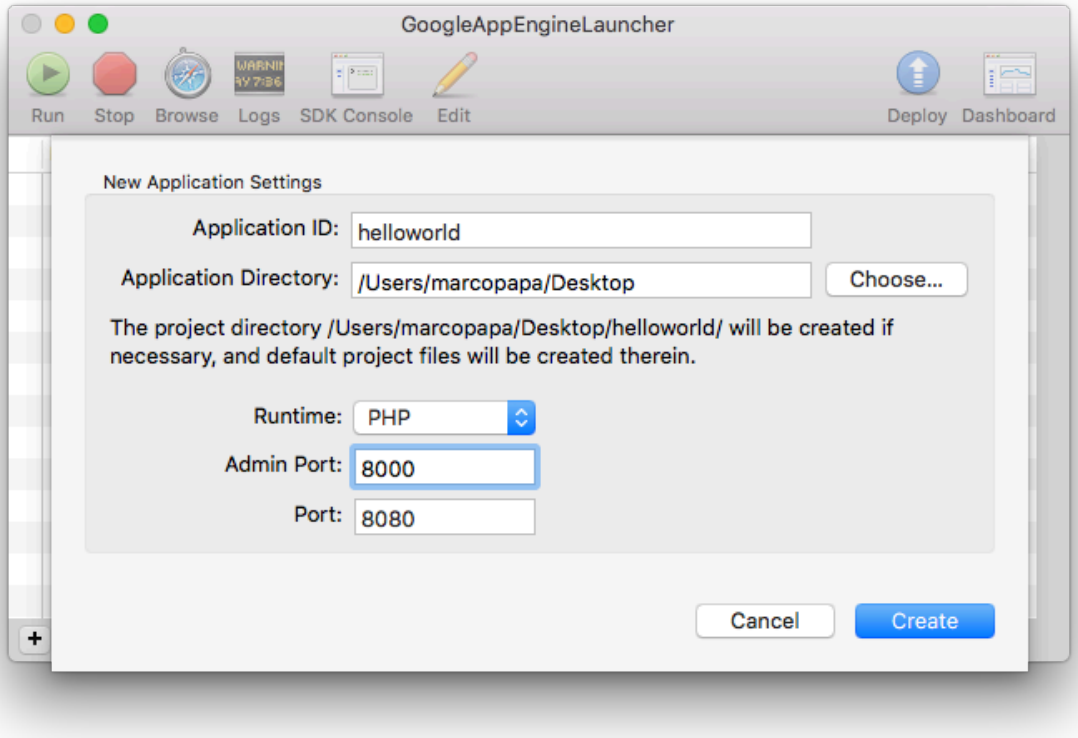


Google App Launcher (Windows)

Invoke File -> Create (Windows) or File -> New Application (OS X). Or use File -> Add Existing Application (OS X) if the app already has been created.



Add New Application (Windows) [Note Runtime should be PHP]

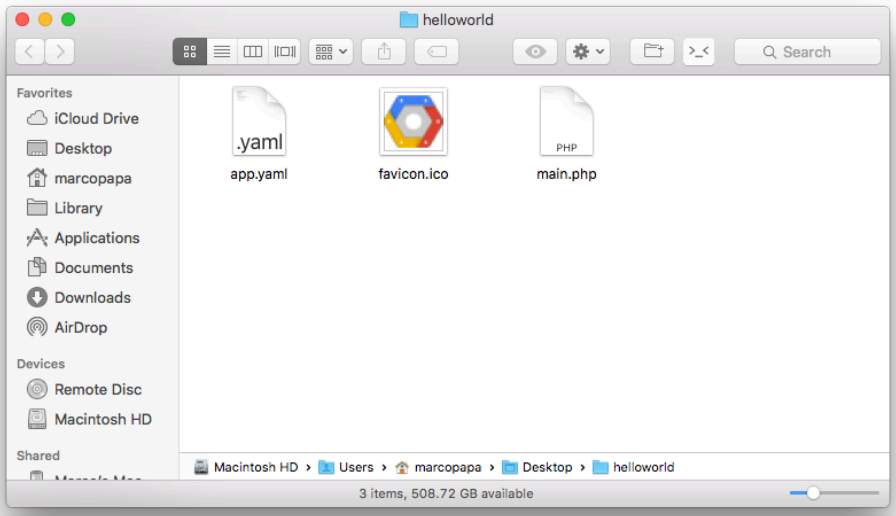


Add New Application (Mac)

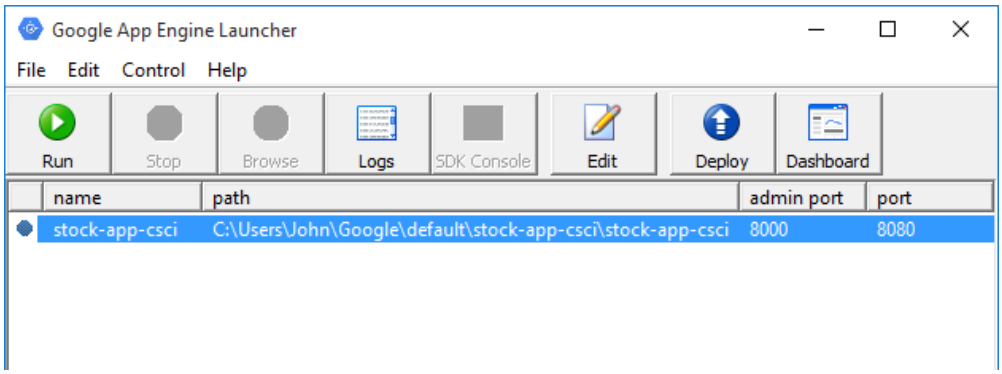
You will need to enter the following fields:

- Application Name or ID: use a new app name, like helloworld (this will be the name of a new folder)
- Parent of Application Directory: use the full path to the parent folder, for example:
    - /Users/yourname/Desktop/ in OS X
    - C:\Users\yourname\Desktop\ in Windows
- Runtime: **should be PHP**
- Port: defaults to 8080
- Admin Port: defaults to 8000

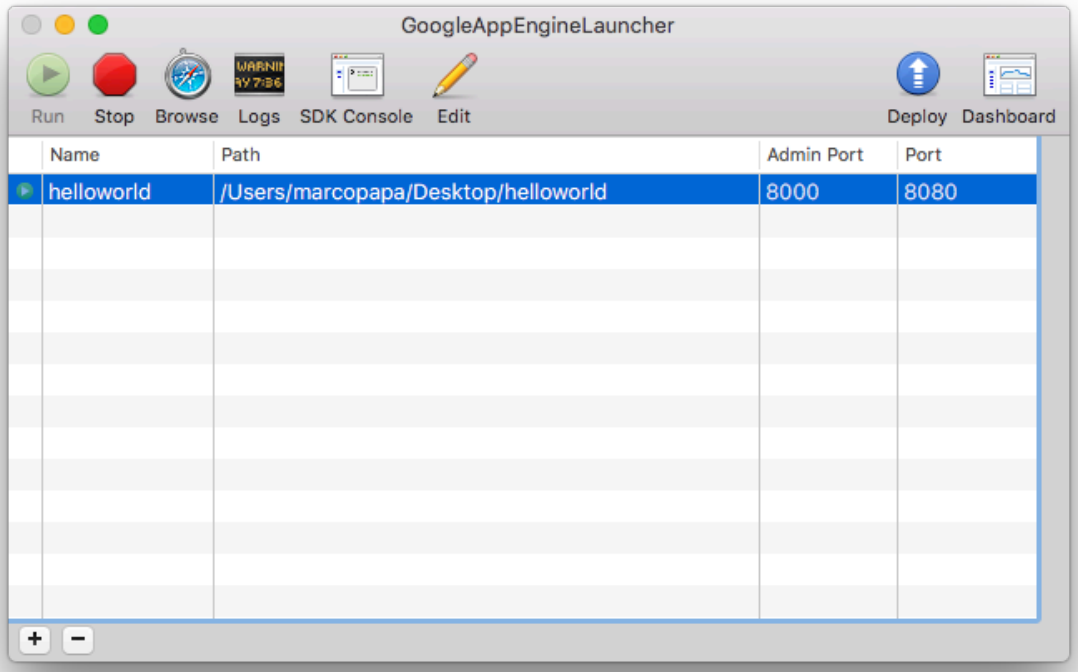
Click **Create**. The folder named helloworld will be created, containing 3 files, as shown below.



Now you can run the application by clicking the **Run** button:



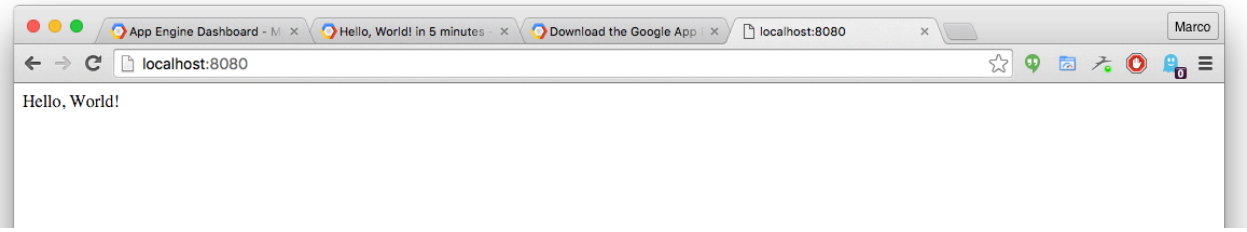
Run application locally (Windows)



Run Application locally (OS X)

The web server is now running, listening for requests on port 8080. You can test the application by visiting the following URL in your web browser:

http://localhost:8080/

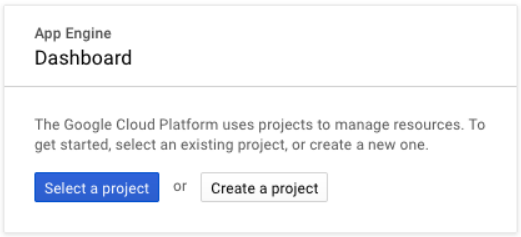


5. Creating a Project and Application

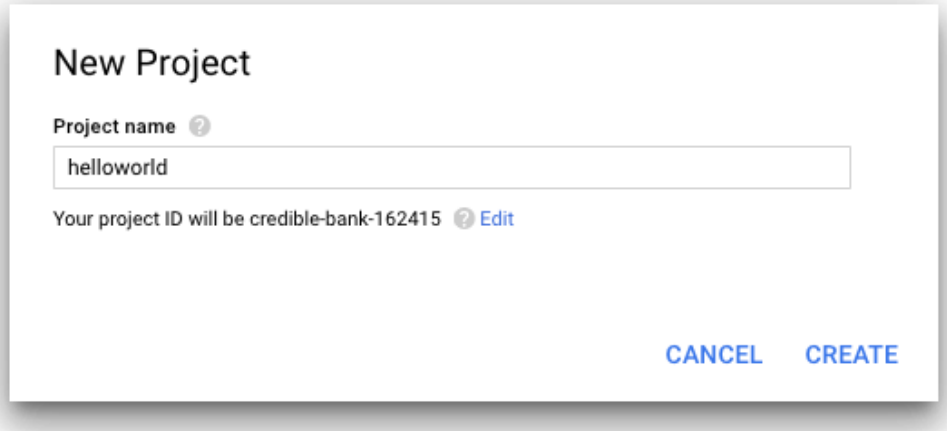
1. Sign in to App Engine using your Google account. If you do not have a Google account, you can create a Google account with an email address and password.

2. Before you can deploy your apps to the App Engine standard environment, you typically need to create or set up the following:
    a. A Cloud Platform **project**
    b. An App Engine **application**
3. To deploy your apps to a Cloud Platform project, you must create a corresponding App Engine application, which defines the location from where you want your App Engine services run. To create a Cloud Platform project and App Engine application:
    a. Go to the App Engine page:

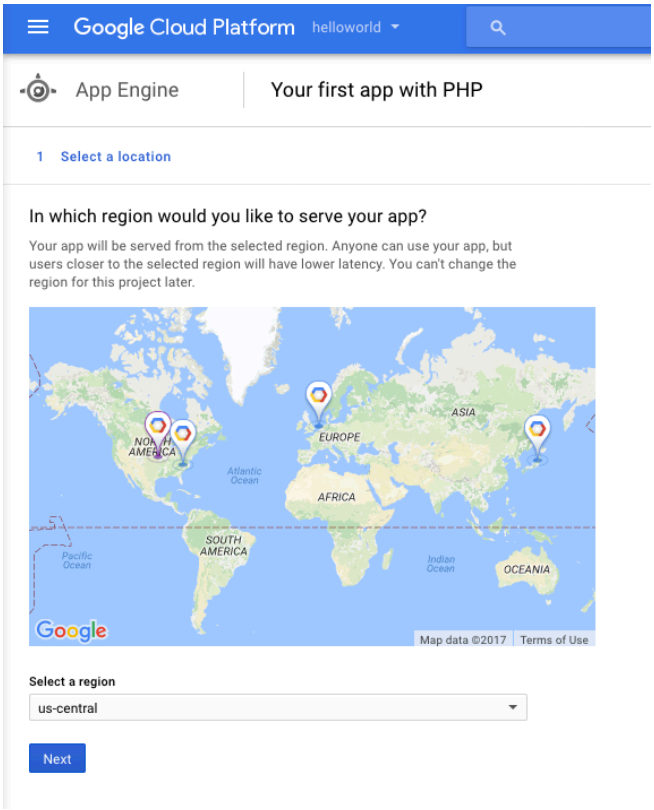
    https://console.cloud.google.com/projectselector/appengine/create?lang=php&st=true



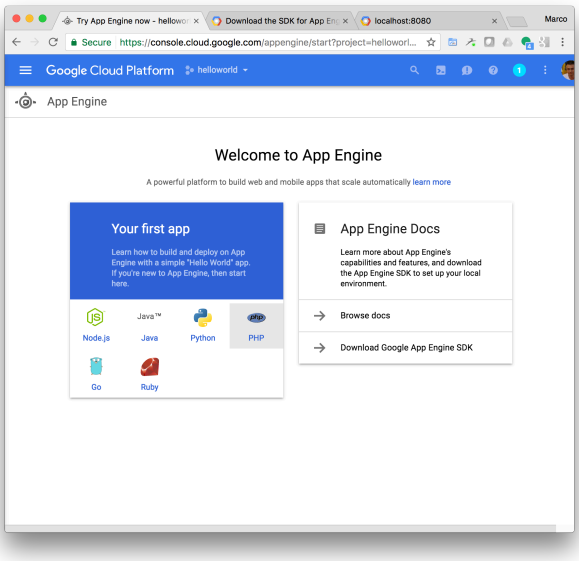
    b. Select or create a Cloud Platform project. If you have not created a Cloud Platform project yet, clock **Create a project**.



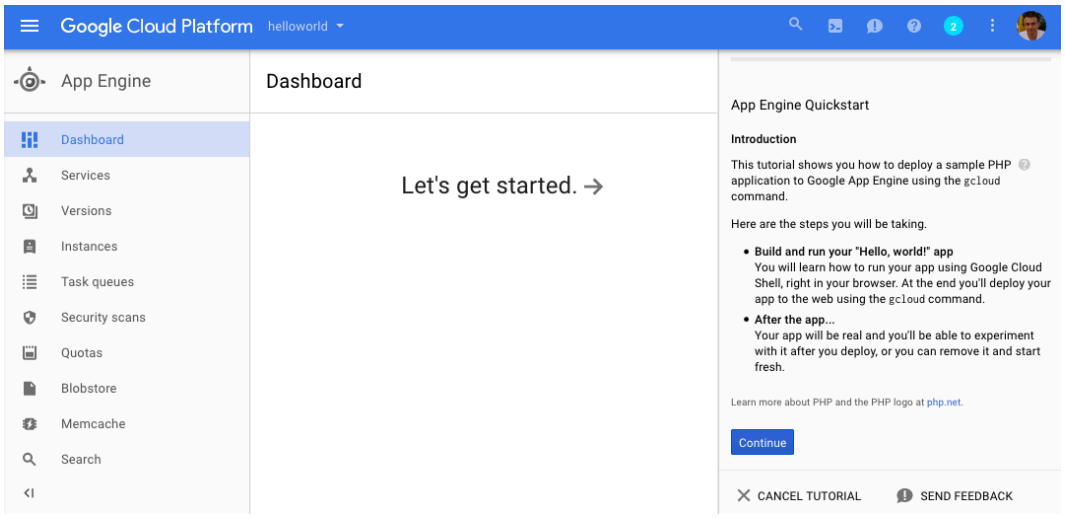
c. In the **New Project** dialog enter a Project name. Notice the **project ID**. Accept the generated project ID or supply your own ID by clicking **Edit**. *This project ID is used as the App Engine application ID.* Note that this ID can only be used once: if you subsequently delete your project, you won't be able to re-use the ID in a new project. Click **CREATE**.



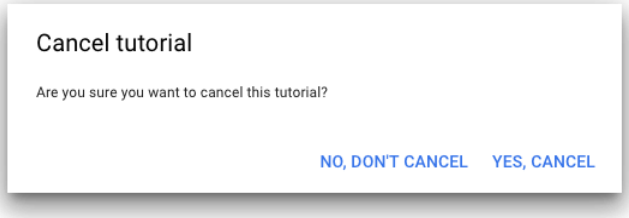
4. You can now **Select a location** for your deployed app. Keep the suggested **us-central**, and click **Next**.
5. The system “Prepares” you App Engine services.



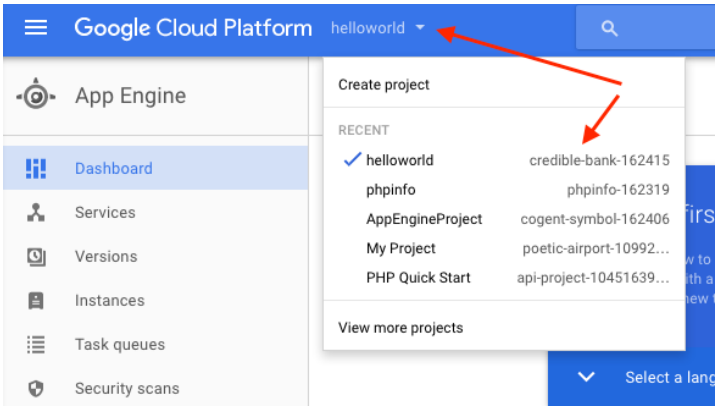
6. Select **PHP** in the **Select a language** dropdown.



7. You project and basic App Engine app (helloworld) have been created. You can start the Tutorial by clicking **Continue**, or you can simply **CANCEL TUTORIAL**.



8. Click **YES, CANCEL**. If you click in the project dropdown, you will see your Project / app name and its corresponding **project ID** from step 5.3.b. Make a note of it.



9. You are now ready to Upload and **Deploy** your finished application to Google App Engine by invoking the following command. This opens a browser window for you to sign in using your Google account. You'll be providing the **project ID** as the argument for -A.
   Note: Make sure you run this command in the parent directory where you created helloworld. Otherwise, give the full path to the helloworld folder.

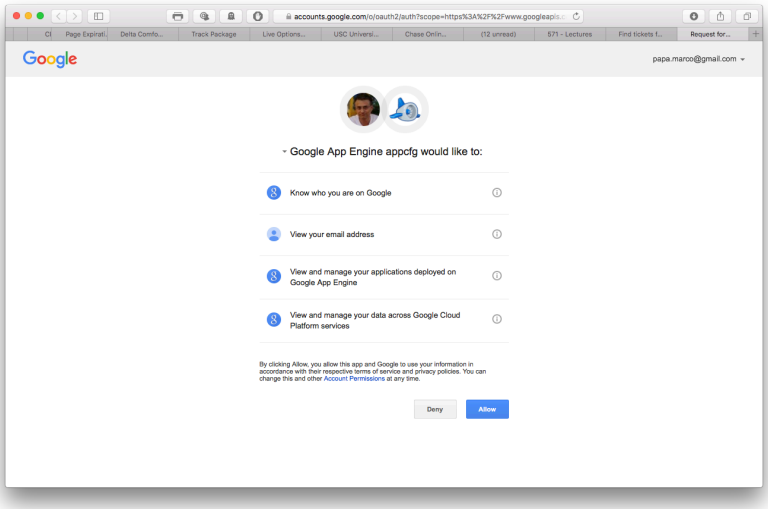
   In OS X enter:

```
/usr/local/google_appengine/appcfg.py -A YOUR_PROJECT_ID update
helloworld/
```

   In Windows enter:

```
python appcfg.py -A YOUR_PROJECT_ID update helloworld/
```

10. The first time you execute this script, you may be asked to *Allow* the appcfg.py script, as shown below:



11. You will receive a message in the browser that “The authentication flow has completed.” Your app is now deployed and ready for use! If everything went well, you will receive a message “Deployment successful” on the terminal console, as shown below.

12. The full URL for your application is http://<YOUR_PROJECT_ID>.appspot.com/.

6. Check PHP Info

To find out the capability and installed options of the PHP component on Google Engine, you need to be able to execute the phpinfo() API. Unfortunately this feature is turned off by default on the Google Cloud Platform.

To enable phpinfo(), you need to create a file named php.ini inside the helloworld folder, containing the following:

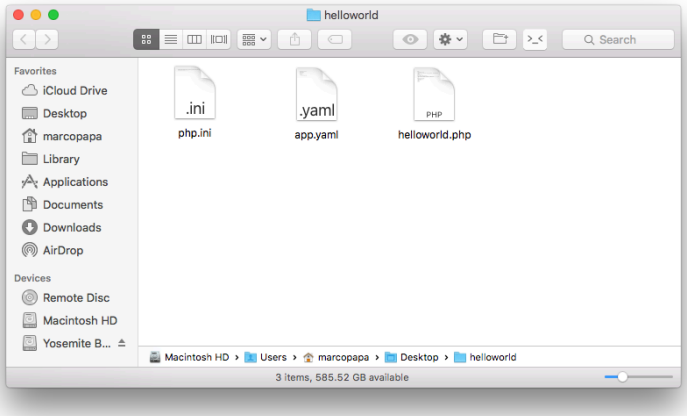
```
google_app_engine.enable_functions = "phpinfo, php_uname, php_sapi_name,
phpversion"

google_app_engine.enable_curl_lite = "1"
```

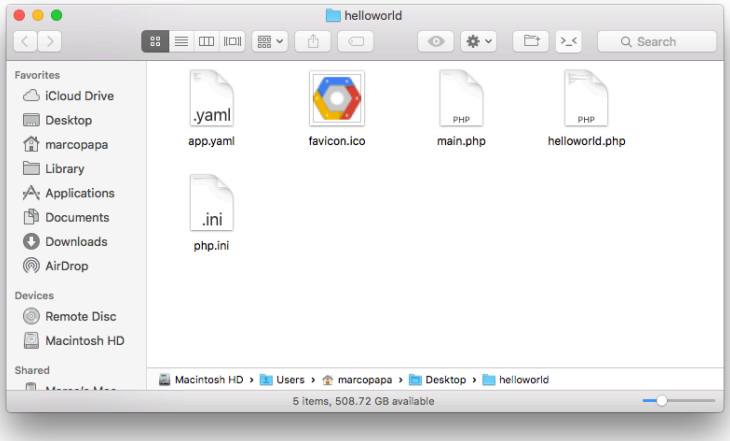
Then update your main.php script with the code:

```
<html>
 <head>
 <title>PHP Test</title>
 <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
 </head>
 <body>
 <h1>PHP Test</h1>
```

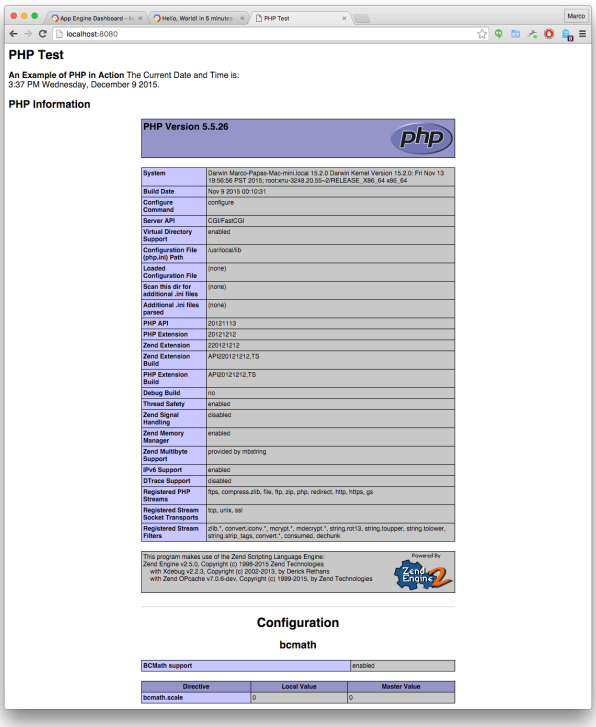
```
<p>
<b>An Example of PHP in Action</b>
<?php date_default_timezone_set('America/Los_Angeles');?>
<?php echo "The Current Date and Time is: "; echo date("g:i A l, F j Y.");?>
</p>
<h2>PHP Information</h2>
<p>
<?php phpversion(); ?>
<?php phpinfo(); ?>
</p>
</body>
</html>
```

The helloworld folder will now contain 3 (or 4) files, as shown below (this assumes you have renamed main.php, as helloworld.php in app.yaml).





You can now “update” your app by invoking the appcfg.py script from section 5.4 above. If all goes well, you’ll see the following new home page:

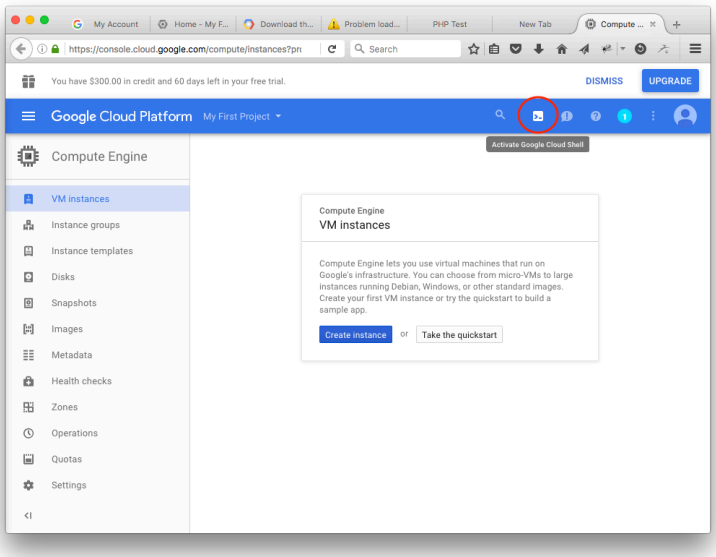


7. Set up Exploring Your instance (Optional)

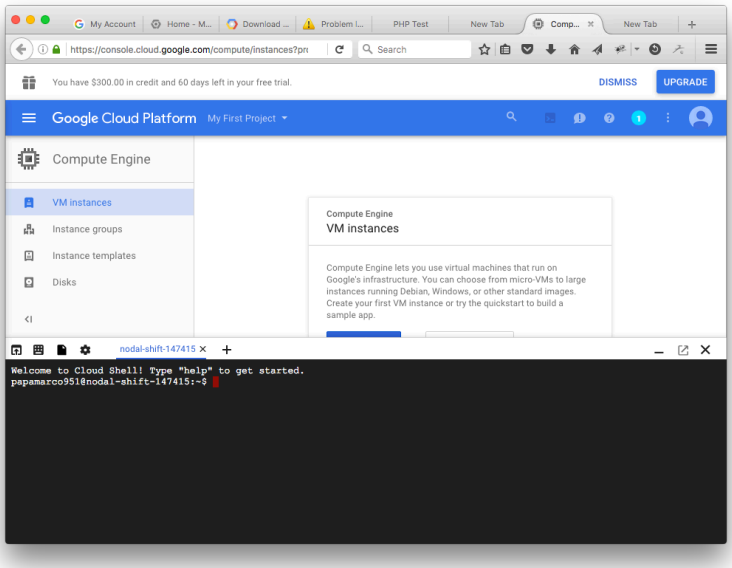
If you want to explore your server instance you can activate the **Google Cloud Shell**.

https://console.cloud.google.com/compute

Select the helloworld project (or My First Project) from the dropdown. Now click on the **Activate Google Cloud Shell** icon next to helloworld.



After waiting a few minutes for Google to establish the connection, you will see the shell appear at the bottom of the browser window. You can now use Linux commands to manage your Cloud Platform Console projects and resources.

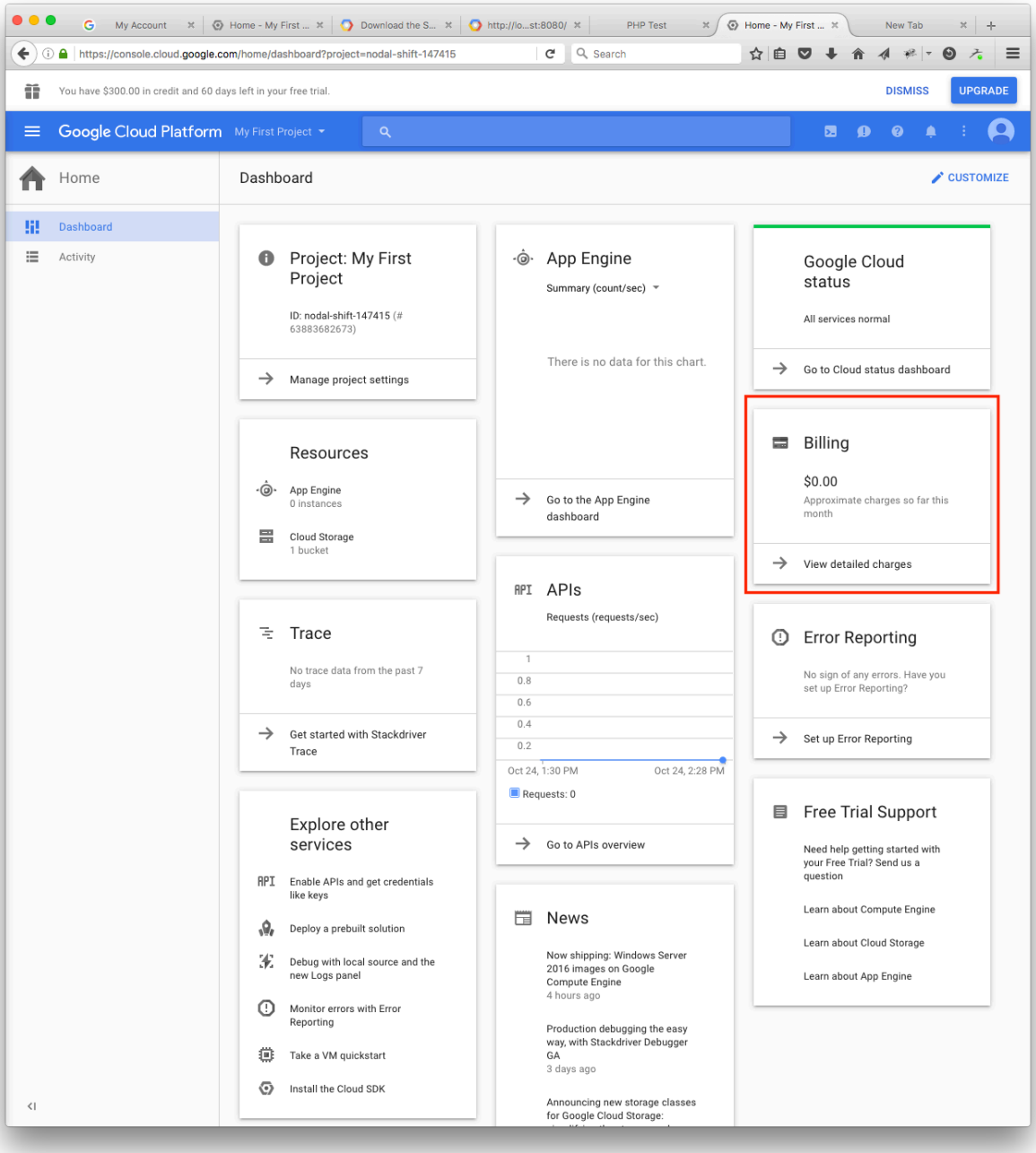


You can read more about the **Google Cloud Shell** here:

https://cloud.google.com/cloud-shell/docs/

8. Monitoring your instance and you Bill

Select Google Cloud Platform and go to the Dashboard. Under **Billing** you will see if you are incurring any charges.



Have fun exploring Google Cloud Platform!!