

**CSI3660 Lab 1 – Google Cloud
Fredericks / W2019
Due 01/25/2018 @ 11:59pm**

For this lab we are going to work with Google Cloud to setup a micro-instance of a virtual machine. This will supplement the virtual machine you will receive at Oakland.

As this is your first lab with me, and I'm not physically there to walk you through all of this, please **read this manual carefully and follow along**. There will be homework questions seeded throughout this document asking you to take a screenshot here or there, report information, etc., and you won't be able to go back to it without starting over.

To nip the question in the bud, yes, you must provide an answer to all questions. If you missed a step, then that is on you to fix. Again, **read carefully**.

You can create as many VMs as you want, but keep in mind that your account will be charged for each moment a VM is online. **Note that you should never put your personal credit card information into the site. This is 100% free for you.**

The reason we're using a micro-instance is that it is free to your account, as long as you don't send/receive too much data. More info here on that: <http://cloud.google.com/free>. We won't be needing any amount of power behind the scenes, unless if you need it for your term project.

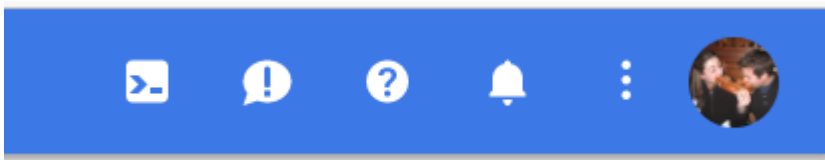
Account Setup

You should have received an email forwarded from myself containing information for signing up for Google Cloud. Your Oakland email is required for the first form, as that will send you the coupon.

The second email you get will be a coupon code to redeem. Click the link to redeem and then read the following **very carefully**.

YOU MUST HAVE A PERSONAL GMAIL ACCOUNT. IF YOU USE YOUR SCHOOL EMAIL FROM HERE ON OUT THIS WILL NOT ONLY NOT WORK, BUT YOU WILL NOT BE ABLE TO FINISH THE LAB.

When you go to sign up for coupons, make sure the icon for your **personal** Gmail account is active. It is in the top right corner. This is mine. Note it is my personal email icon, it is not my Oakland profile image:



Easiest way to make sure is to click the profile icon and check that your oakland.edu account is not active. Your Oakland email should either be signed out or grayed out.

Click the link in your email to sign up for the free Google Cloud credits, making sure to copy the unique code.

Education grants

Please enter the coupon code provided to you via the Google Cloud Platform Education Grants program to receive credit for Google Cloud Platform. Get what you need to build and run your apps, websites and services.

Coupon code

NALW-TAPE-KPGF-D4HP

Credit amount	Expiration date	Course
\$100.00	Sep 3, 2018	CSCI5900- Sept 2017

Please email me updates regarding feature announcements, performance suggestions, feedback surveys and special offers.

☐ Yes ☒ No

Google Cloud Platform education grants credits terms and conditions

By clicking "Accept and continue" below, you, on behalf of yourself and the organization you represent ("You") agree to these terms and conditions:

The credit is valid for Google Cloud Platform products and is subject to Your acceptance of the applicable Google Cloud Platform License Agreement and any other applicable terms of service. The credit is non-transferable and may not be sold or bartered. Unused credit expires on the date indicated on the media conveying the promotion code. The credit may be issued in increments as You use the credit over the period of time during which the credit is valid. Offer void where prohibited by law.

You represent that you are accepting the promotional credit on behalf of your educational institution and the credit can only be used on behalf of the educational entity and not for your personal use. You represent, on behalf of such educational entity, that (i) You are authorized to accept this credit; (ii) the credit is consistent with all applicable laws and regulations, including relevant ethics rules and laws; and (iii) the provision of credits will not negatively impact Google's current or future ability to do business with such educational entity.

You agree that we may share the following information with your educational institution and course instructor: (1) personal information that you provide to us during the coupon redemption process and (2) information regarding your use of the coupon and Google Cloud Platform products.

Accept and continue **Clear**

Erik Fredericks

Account — Privacy

View profile

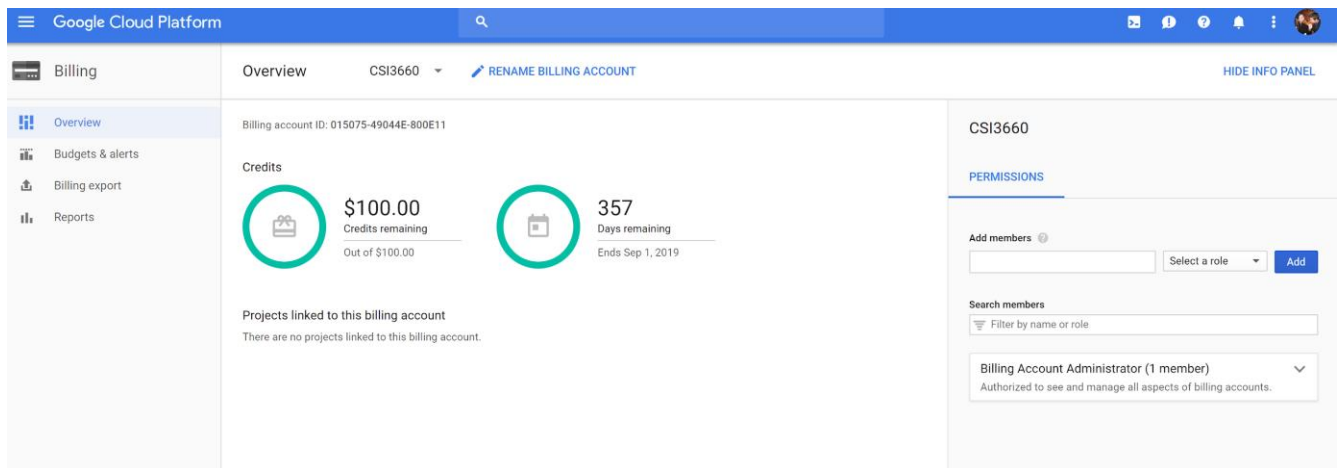
Erik Fredericks
fredericks@oakland.edu

Add account **Sign out**

Note that my personal Gmail account (email redacted) is active. Also, the code above will not work for you, as I have redeemed it for teaching purposes. You should have a **\$50** credit in your account. If you run out of money, I can request more for you, however that will require turnaround time for Google to approve it.

Ok, now you should have a billing account. You can access this at <http://cloud.google.com> now whenever you want. Google Cloud itself is really outside the scope of this lab, however I'd recommend reading up on its capabilities (hint: there are a *lot* of cool things you can do with it).

You should be dumped to a screen that looks like this:



This is the Billing page. It tells you how much money you have in your account. All of your Projects will be linked to this billing account. This is how cloud computing works.

We now need to create a project for the class. The project will contain all VMs related to the class. Click the Google Cloud Platform logo on the top left to bring you to the home page (also accessible via <https://console.cloud.google.com>).

You should see a card titled **Project info**. Click **Go to project settings** and you should see a similar window to this:



Click New Project and name it **<LastName>-CSI3670-W2019**, where <LastName> is your last name (without the angle brackets). Select your newly created billing account and leave the organization alone. It should look like (2019, not 2018 though):


New Project

Project Name *
CSI3660-F2018 ?

Project ID: csi3660-f2018. It cannot be changed later. [EDIT](#)

Billing account *
CSI3660 ▼

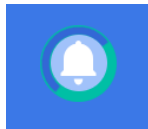
Any charges for this project will be billed to the account you select here.

Location *
 No organization [BROWSE](#)

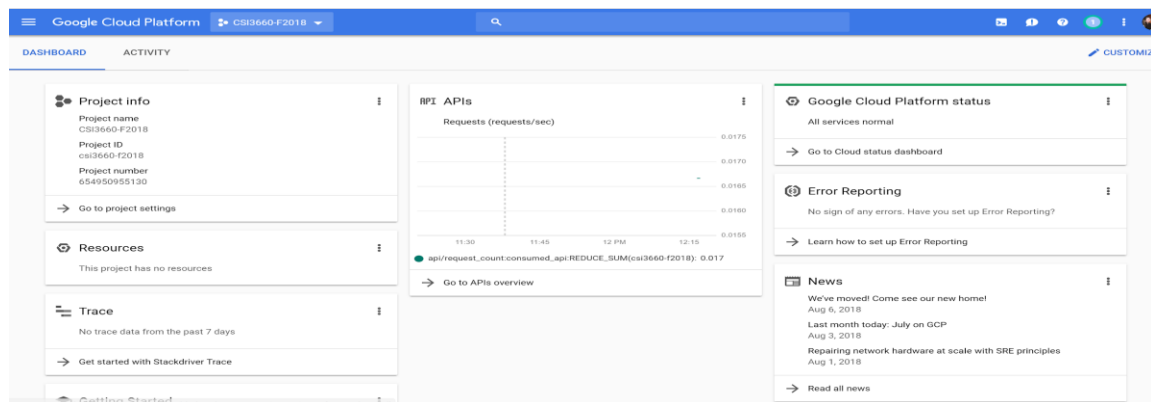
Parent organization or folder

[CREATE](#) [CANCEL](#)

This may take a little while, depending on the speed of Google. At the top right you'll see an icon like this:

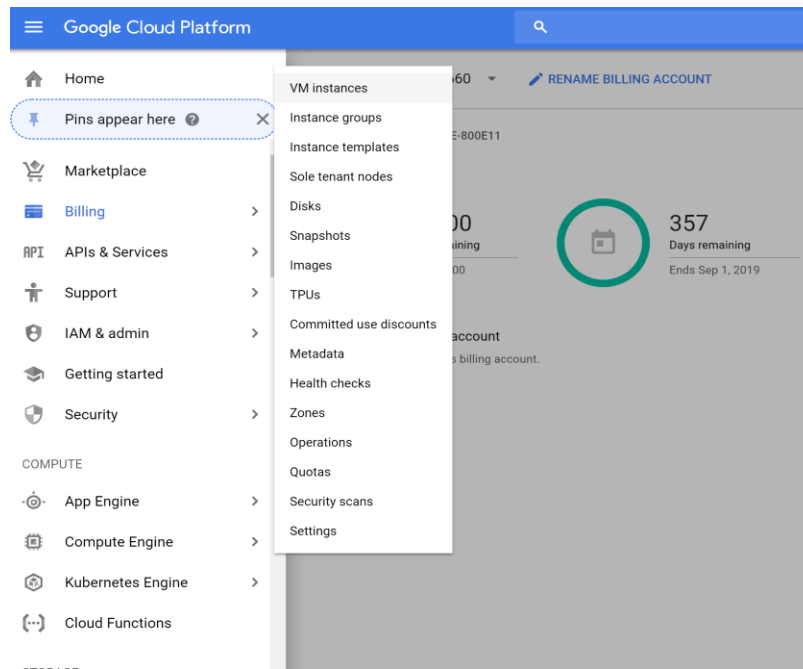


If it is spinning, then Google is working in the background. You can click it for more information. Once it's done, select your newly-created project from the drop down at the top of your cloud console.



Now, you will create your VM.
VM Creation

First, click the options menu (3 horizontal lines) on the top left and then click **Compute Engine**.



It may take a few moments for Compute Engine to initialize. Once it is done, click the **Create** button. You'll be taken to the VM creation page. Name it **<lastname>-csi3670-microinstance-1**. The region and zone should be **us-east** as that is closest to you, but note all the different regions you can create a VM on.

Now, play with machine type a bit, noting the changes in cost on the right. If you want a beefy machine, then you're going to pay a lot for it. We're going to go for the smaller model, because again, it is free.

We're also going to use Ubuntu 18 as the Linux distribution and the **micro** instance in the options, giving it 30GB as well.

Your screen should look like this:

Create an instance

To create a VM instance, select one of the options:



New VM instance

Create a single VM instance from scratch



New VM instance from template

Create a single VM instance from an existing template



Marketplace

Deploy a ready-to-go solution onto a VM instance

Name

fredericks-csi2520-microinstance-1

Region

us-east1 (South Carolina)

Zone

us-east1-b

Machine type

Customize to select cores, memory and GPUs.

micro (1 shared...

0.6 GB memory

Customize

Container

☐ Deploy a container image to this VM instance. [Learn more](#)

Boot disk



New 30 GB standard persistent disk
Image
Ubuntu 18.04 LTS

Change

Identity and API access

Service account

Compute Engine default service account

Access scopes

- ☒ Allow default access
- ☐ Allow full access to all Cloud APIs
- ☐ Set access for each API

Firewall

Add tags and firewall rules to allow specific network traffic from the Internet

- ☒ Allow HTTP traffic
- ☒ Allow HTTPS traffic

\$5.08 monthly estimate

That's about \$0.007 hourly

Pay for what you use: No upfront costs and per second billing

Your first 744 hours of f1-micro instance usage are free this month. [Learn more](#)

[Details](#)

Firewall

Add tags and firewall rules to allow specific network traffic from the Internet

- ☒ Allow HTTP traffic
- ☒ Allow HTTPS traffic

[Management, security, disks, networking, sole tenancy](#)


You will be billed for this instance. [Learn more](#)

Create

Cancel

Equivalent [REST](#) or [command line](#)

The VM instance creation will take a few minutes.

Filter VM instances							Columns ▼
<input type="checkbox"/> Name ^		Zone	Recommendation	Internal IP	External IP	Connect	
<input type="checkbox"/>  fredericks-csi2520-microinstance-1		us-east1-b		10.142.0.2 (nic0)	35.231.6.180 ↗	SSH ▼	⋮

So now that's the instance is running (green check), open the instance by clicking its name and looking at the details and monitoring tabs.

Remote Access

It is now time to SSH into your server. Google Cloud makes this ridiculously easy to do in the browser. Go back to the VM instances page and click the SSH button:

Connect	
SSH ▼	⋮

This will pop open an SSH window, similar to this:

```
System information as of Fri Jan  4 05:25:30 UTC 2019

System load:  0.08                Processes:            86
Usage of /:   3.8% of 28.90GB     Users logged in:     0
Memory usage: 36%                IP address for ens4: 10.142.0.2
Swap usage:   0%

Get cloud support with Ubuntu Advantage Cloud Guest:
  http://www.ubuntu.com/business/services/cloud

0 packages can be updated.
0 updates are security updates.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

erik_fredericks@fredericks-csi2520-microinstance-1:~$
```

Yay! You are now in your Linux virtual machine. Now we should make sure our machine is up to date and install Apache. This is something that should be done fairly regularly to make sure things like security updates are applied to your software.

In the terminal, run (without the dollar sign, that is an indicator that you should type a command into the shell).

```
$ sudo apt-get update
$ sudo apt-get upgrade
$ sudo apt-get install apache2
```

Type **y** and hit enter to accept.

This is your microinstance. **Take a screenshot of your browser window with the Apache default screen** (should just be able to visit your external IP address). This is the one that you leave on all the time.

Windows VM

Go through the same process as before, but instead pick Windows Server 2016. Name it **<lastname>-csi3670-windows-instance-1**. Give it a **n1-standard-1 (1 vCPU, 3.75 GB memory) CPU and RAM**. Anywhere from **30-50GB** should be fine for HDD space.

Create it, turn it on. **This one you should turn off when you are done!**

Click the RDP icon in Google Cloud to launch a Remote Desktop session (either use the downloaded

.rdp file or install the Chrome extension). If you're on Mac or Linux, look up how to connect via Remote Desktop.

Open up Windows Server. Install the Web Server Role. Add the FTP feature. When you are done, **take a screenshot of your Server Manager** to demonstrate that you installed the role appropriately.

Turn off the Windows VM when you are done!

Fill out the report on the last page and turn in ONLY the report page!

85 points

Name:

Date:

Homework 1:

1. Paste the two screenshots from above here. (40 points)
2. Go to <https://cloud.google.com/products/> and pick **2** random Google products that are available in their cloud platform (meaning, you have access if you wish). Briefly describe (1) what it is and (2) why it might be helpful. **Do not simply just copy and paste the descriptions.** (10 points).
3. Assume you are installing Windows Server 2012. Provide two reasons for selecting one version over another. For example, why would you want to install the Foundation edition over the Datacenter edition? Why would you want Standard over Essentials? (10 points)

4. Look over some of the available roles that Windows Server provides. Select two and describe their purpose. (10 points).
5. What is the difference between Type-0 (full) and Type-1 (para) virtualization? (10 points)
6. What is the IP address of your Ubuntu virtual machine? (5 points)