Tutorial on using the Google Cloud Platform (GCP)

Courtesy to the following helpful resources online:

- http://cs231n.github.io/gce-tutorial/ (http://cs231n.github.io/gce-tutorial/)

A word of caution: STOP YOUR INSTANCES

- Please do not forget to **stop your instance(s)** when you are done, otherwise you will run out of credits!
    - You can stp by clicking on the **stop** button at the top of the page showing your instances)

First things first: Try the free stuff first, if you want!

- Google is generous enough to give $300 worth of google cloud credit to the new google/gmail users:
  - Here is the link to activate your credit https://cloud.google.com/free/docs/frequently-asked-questions#free-trial (https://cloud.google.com/free/docs/frequently-asked-questions#free-trial)
  - Just make sure you are eligible.
  - Remember to select **Individual** as **Account Type**
  - It might ask you for your credit card information, but Google made it very clear that they won't charge you a penny during your free trial (which is a year from the day you are given the credit), and it won't auto-recharge after the trial is over! Neat, isn't it!

First things first: Try the free stuff first, if you want!

- CAUTION: If you exceed the credit limit (which is $300) within the trial period, you may notice the charge based on the Google cloud platform's pricing model, which is located at https://cloud.google.com/compute/pricing (https://cloud.google.com/compute/pricing). Please do understand the consequences of overuse of the credit within the trial period. **I will not be responsible for any of these incurred charges.**
- Make sure you read all the agreements/terms etc. before you signup, and **I will not be responsible for any consequences including Google's way of collecting user data (including user information, email, credit card information, demographics, dataset stored in cloud storage), or in an unlikely event of a massive attack against Google platform revealing its user information.**

Google cloud platform credit from me

- (1) Not happy with the google free trial? Or, (2) the google trial credit of $300 is finished? I have something for you!
  - As an enrolled student in my class, I will give you $50 google cloud credit.
  - Please send me an email requesting the credit and also mentioning which of the two cases (1 or 2) applies to you. I will send you a link to get the credit.
  - **CAUTION:** If you exceed the credit limit (which is $50), you may notice the charge based on the Google cloud platform's pricing model, which is located at https://cloud.google.com/compute/pricing (https://cloud.google.com/compute/pricing). Please do understand the consequences of overuse of the credit within the trial period. **I will not be responsible for any of these incurred charges.**
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  - You can request for more if you finish up the $50. Please let me know by email. Thanks

Google cloud platform credit from me

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- You can request for more if you finish up the $50. Please let me know by email. Thanks

Getting to know the GCP Console

- Once signed-up, go to http://console.cloud.google.com (http://console.cloud.google.com)
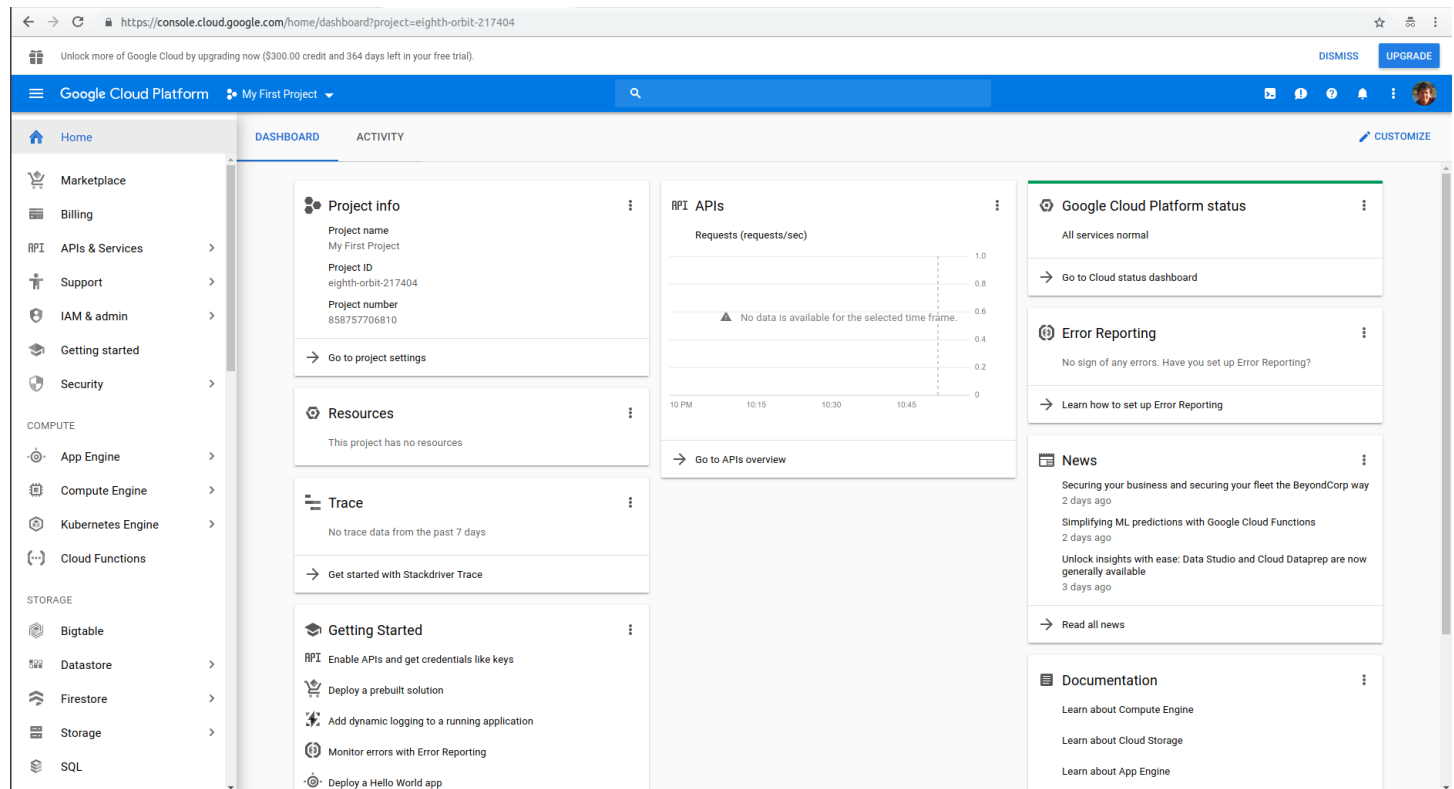
(figs/console-01.png)

Click on the "Billing" link

(figs/console-02a.png)

Create the compute engine for the course

1. From the GCP/console dashboard, click "Compute Engine"
2. Click "Images"

Create the compute engine for the course

1. Click on "c2-deeplearning-tf-1-10-cu92-20180914" image and and click "Create an instance" button. Then configure the following entries before you hit the "Create" button at the bottom of the configuration page:
   - Name: cse-cudenver-deep-learning
   - Region: us-west1 (Oregon),
   - Zone: us-west1-b
   - Machine type (Click "Customize" to get more options):
     - Cores: 1 vCPU (1-8 cores)
     - Memory: 3.75 GB
     - CPU Platform: Automatic
     - GPUs
       - Number of GPUs: 1
       - GPU Type: NVIDIA Tesla K80
   - Boot disk: Deep Learning image: (30GB)

Create the compute engine for the course

1. Hit the "Create" button at the bottom of the page. It takes few minutes to create your instance. Once done, connect to the instance via SSH. It might prompt you if you would like to install nvidia driver (y/n). Please hit "y" to install it.
2. After the instance is created, it automatically boots up the instance. So BE CAREFUL FROM NOW ON. The INSTANCE IS RUNNING!! Running your instance will cost you. According to the current pricing model (as of 9/23/2018), Google will charge you $ 0.35 (for the CPU), $0.45 (for the GPU) per hour of running the instance.

   - CAUTION AGAIN: STOP RUNNING THE INSTANCE WHEN YOU ARE DONE.
     - Select the instance on the the "Compute Instance" > "VM Instances" Page, and do any of the following:
       - Recommended way of stopping an instance: Connect to the instance via SSH, and apply the command: sudo poweroff
       - Another way: Hit the "STOP" button.

Starting up your instance

- Select the instance on the the "Compute Instance" > "VM Instances" Page, and hit the "Start" button.
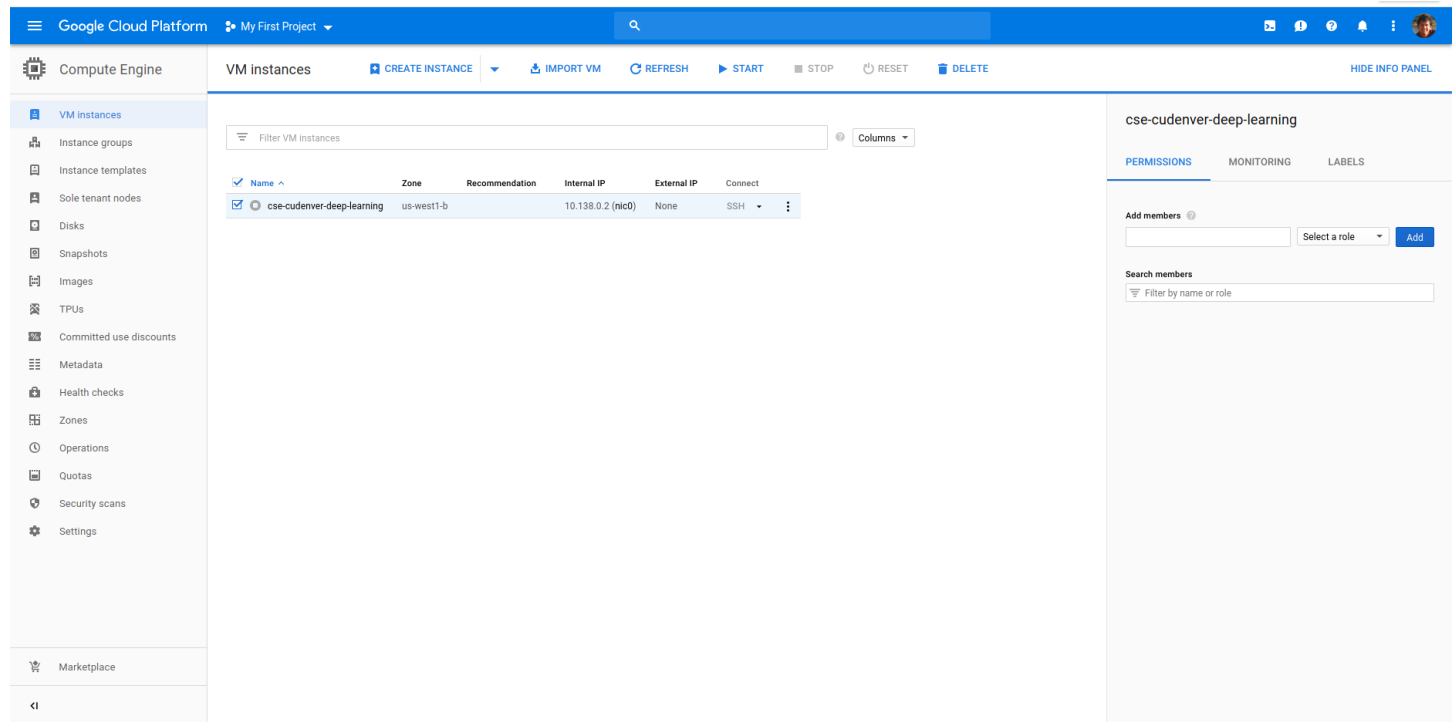
(figs/instance-01.png)

The instance is running... now connect via SSH

(figs/instance-02.png)

And here is the SSH prompt

[(figs/instance-03.png)](figs/instance-03.png)

Be sure to stop the instance when done, by typing
sudo poweroff

(figs/instance-04.png)

Want to run jupyter notebook on the GCP instance?

Step 1: Allow HTTP/HTTPS traffic by editing the instance

- Stop the instance, and hit the "Edit" button below

(figs/allow-HTTP-HTTPS.png)

Want to run jupyter notebook on the GCP instance?

Step 1: Allow HTTP/HTTPS traffic by editing the instance

Want to run jupyter notebook on the GCP instance?

Step 1: Allow HTTP/HTTPS traffic by editing the instance

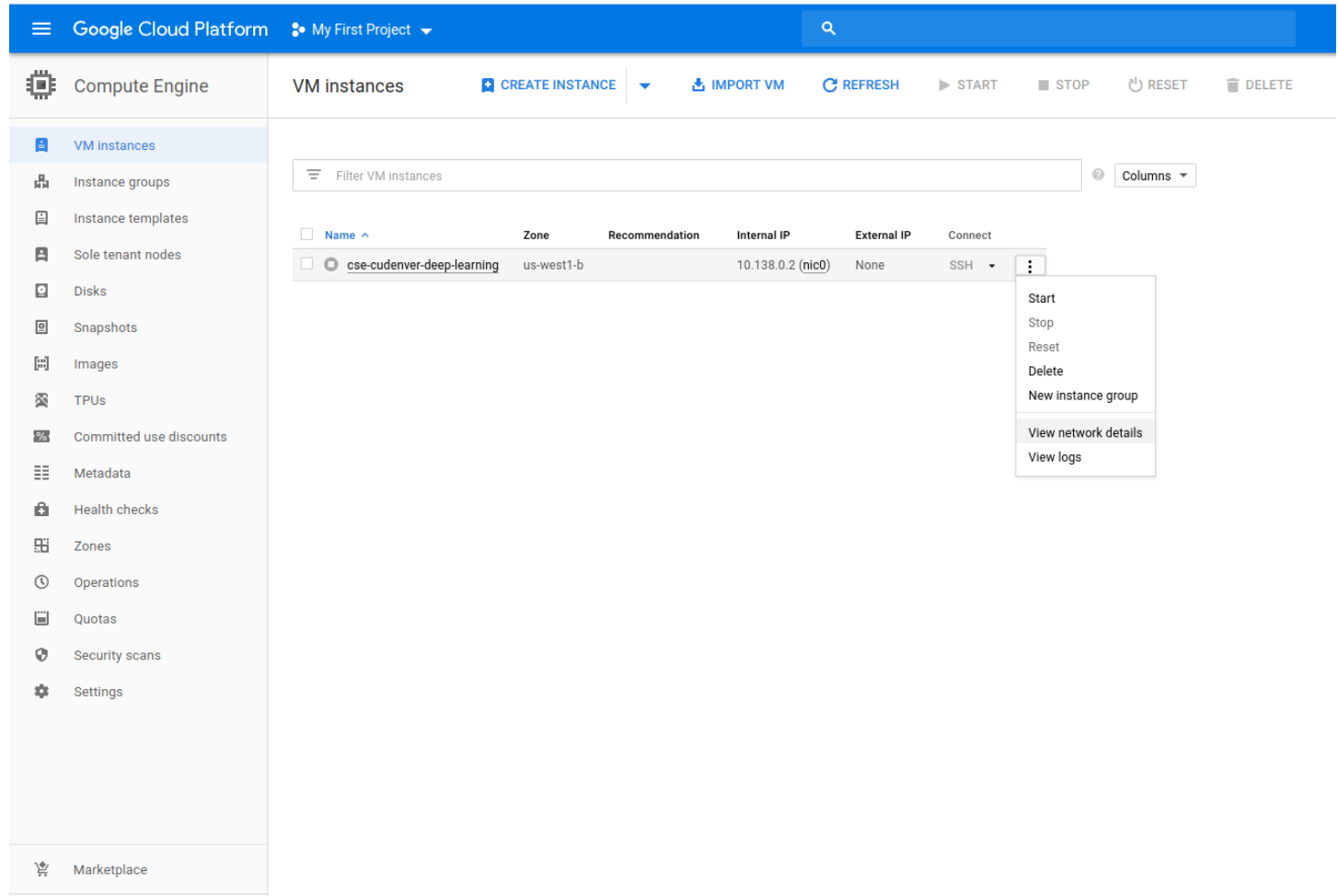- Then select the the two options at the "Firewalls" section of the form:

(figs/allow-HTTP-HTTPS-02.png)

Want to run jupyter notebook on the GCP instance?

Step 2: Open a port, (e.g., 5800)

- Go to "Network details" of the instance

(figs/step-01.png)

Want to run jupyter notebook on the GCP instance?

Step 2: Open a port, (e.g., 5800)

- Click on the "Firewall rules" option

(figs/step-02.png)

Want to run jupyter notebook on the GCP instance?

Step 2: Open a port, (e.g., 5800)

- Create a new rule.
- we use dl-rule. Select "All instances in the network" for Targets (if the menu item exists). Enter 0.0.0.0/0 for Source IP ranges and tcp: for Specified protocols and ports where is the number you used above. Click on the blue Create button. See the screenshot below.
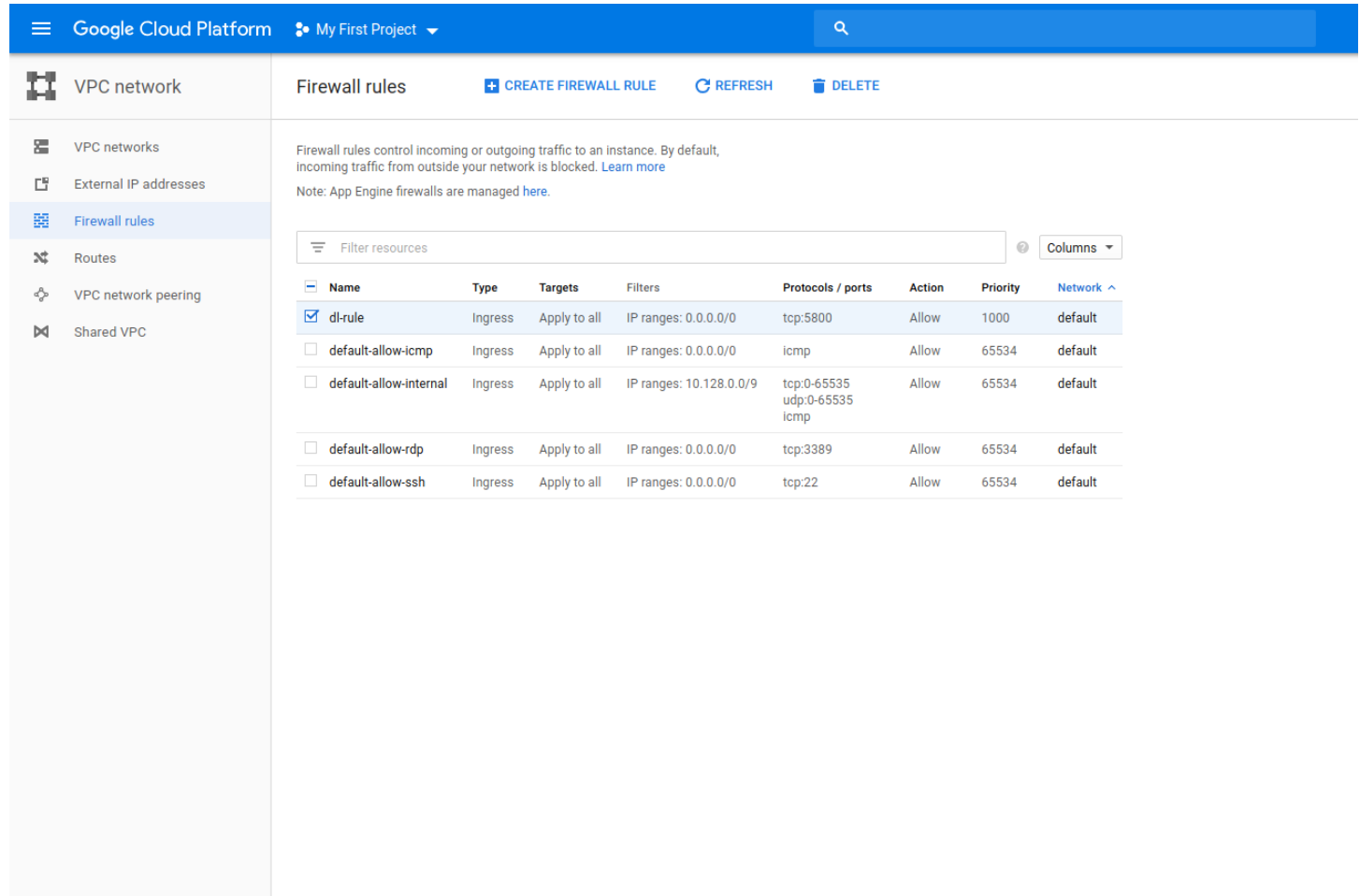
(figs/step-03.png)

Want to run jupyter notebook on the GCP instance?

Step 2: Open a port, (e.g., 5800)

- Just created the rule "dl_rule"

(figs/step-04.png)

Want to run jupyter notebook on the GCP instance?

Step 2: Open a port, (e.g., 5800)

- Now, you are ready to start the instance. Also, make note of the external IP address (e.g., here in this case it is 35.227.148.50. It might change overtime. Or, you can have a static external ip address with a fee so that you don't have to worry about the change of external ip over time.

(figs/step-05.png)

Want to run jupyter notebook on the GCP instance?

Step 3: Configure jupyter notebook

- Open up an SSH session with the GCP instance, and check if you have a jupyter configure file at:

```
ls ~/.jupyter/jupyter_notebook_config.py
```

- If the file does not exist, create on with the following command:

```
jupyter notebook --generate-config
```

- Open the config file and browse through the following 3 lines (uncomment and change the values to the following):

```
c.NotebookApp.ip = '*'
c.NotebookApp.open_browser = False
c.NotebookApp.port = 5800
```

Here, 5800 is the desired port number for the jupyter notebook.

Want to run jupyter notebook on the GCP instance?

Step 3: Configure jupyter notebook

- Now, lauch jupyter notebook and copy the :5800/?token..... portion of the url as highlighted in the following snapshot

(figs/jpn-01.png)

Want to run jupyter notebook on the GCP instance?

Step 4: Now go to your browser (in your local machine)

- At the address bar, type the external IP and the :5800/?token... portion to get the exact jupyter notebook URL

(figs/jpn-02.png)

Want to run jupyter notebook on the GCP instance?

Step 4: Now go to your browser (in your local machine)

- You should see the following
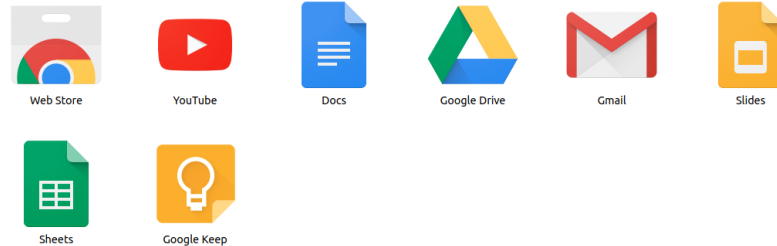

(figs/jpn-03.png)

Want to run jupyter notebook on the GCP instance?

Step 4: Now go to your browser (in your local machine)

Commandline tools to Connect to GCP instance

- Download the Google Cloud SDK that is appropriate for your platform from https://cloud.google.com/sdk/docs/ (https://cloud.google.com/sdk/docs/) and follow their installation instructions.
- Then run gcloud init to get started:

  ```
  gcloud init
  ```

  - When prompted, make sure you select us-west1-b as the timezone.
- When the GCP instance is running, from your local machine you can get to prompt directly via the following command:

  ```
  gcloud compute ssh --zone=us-west1-b cse-cudenver-deep-learning
  ```

- To know more about the GCP api commands, please look into the SDK documentation above.

BIG REMINDER: Make sure you stop your instances!

- Don't forget to stop your instance when you are done (by clicking on the stop button at the top of the page showing your instances).
- You can restart your instance and the downloaded software will still be available.

```
In [1]:  print("Thanks all for your attention. See you in class. - Dr. B")

         Thanks all for your attention. See you in class. - Dr. B
```