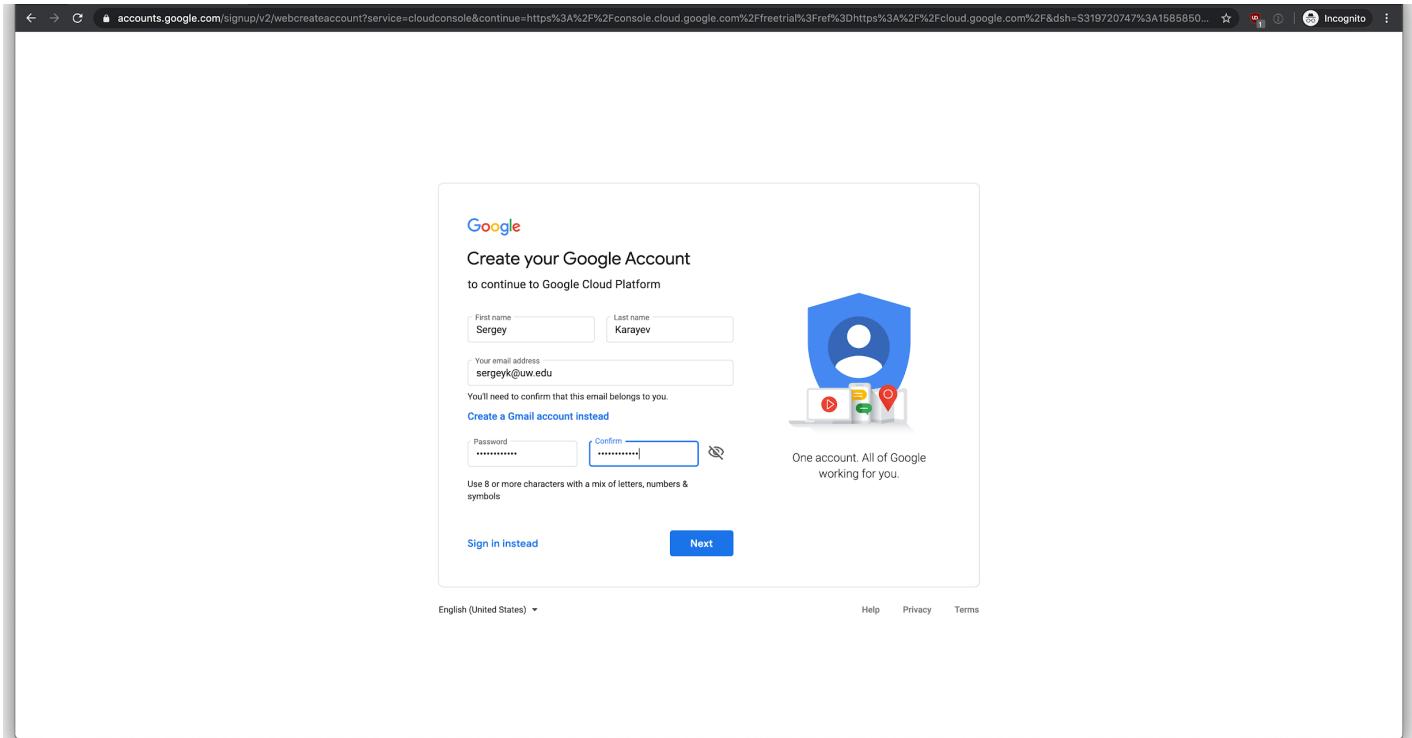


# Setting up Google Cloud Platform

## Set up GCP account

First off, register for GCP account at <https://cloud.google.com> with your personal email address. (Unfortuantely, your @berkeley.edu account may be difficult to get GPU quota increases in.)



Agree to the terms, and learn that there will be a \$300 credit for your account! You'll have to put in your credit card but it won't be charged until you upgrade to a paid account. In any case, **watch your instance(s) like a hawk to make sure they're shut down every time you're done working!**

Try Google Cloud Platform for free

## Step 1 of 2

Mr. Sergey Karayev  
sergeyk@berkeley.edu

SWITCH ACCOUNT

Country

United States

Terms of Service

I agree to the [Google Cloud Platform Terms of Service](#), and the terms of service of [any applicable services and APIs](#). I have also read and agree to the [Google Cloud Platform Free Trial Terms of Service](#).

Required to continue

**CONTINUE**

### Access to all Cloud Platform Products

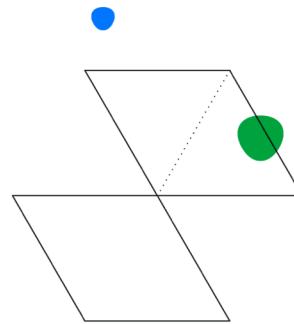
Get everything you need to build and run your apps, websites and services, including Firebase and the Google Maps API.

### \$300 credit for free

Put Google Cloud to work with \$300 in credit to spend over the next 90 days.

### No autocharge after free trial ends

We ask you for your credit card to make sure you are not a robot. You won't be charged unless you manually upgrade to a paid account.



Welcome!

Get started with Google Cloud Platform

Begin with the basics

Get up and running quickly by checking off common tasks

**GO TO CHECKLIST**

What's covered

**Google Cloud Platform**

Welcome!

Thanks for signing up. Your free trial includes \$300 in credit to spend over the next 12 months. If you run out of credit, don't worry — you won't be billed unless you [turn on automatic billing](#).

**GOT IT**

Top products

**VIEW ALL**

Compute products

**Compute Engine**  
Made by Google

Scalable, high-performance virtual machines

**GO TO COMPUTE ENGINE**

Other popular compute options

**Kubernetes Engine**  
One-click Kubernetes clusters, managed by Google

**App Engine**  
A platform to build web and mobile apps that scale automatically

**Functions**  
Event-driven serverless functions

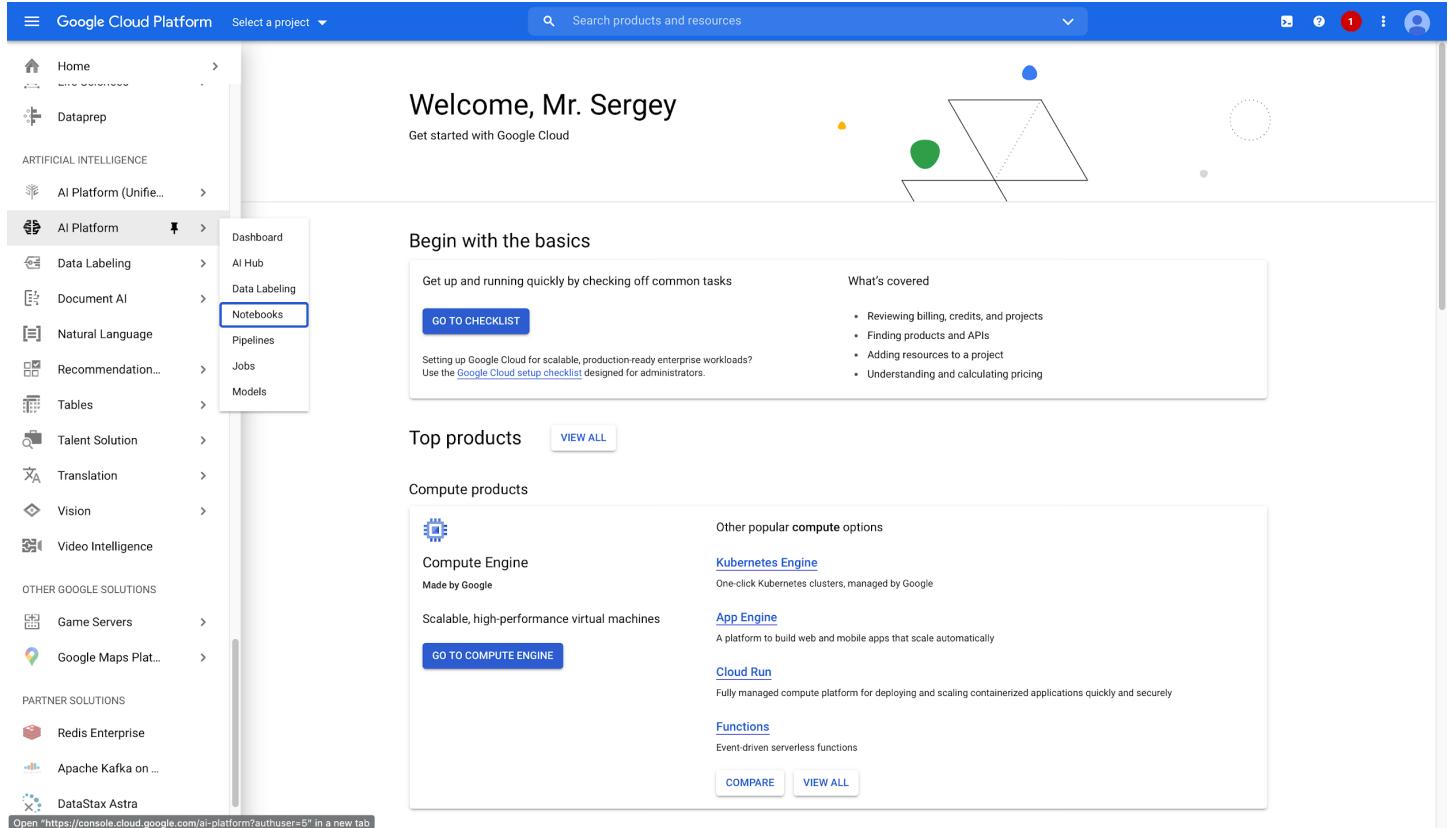
**COMPARE** **VIEW ALL**

Storage and database products

# Set up your GCP instance

Let's try to start up our instance. We will be using the AI Platform Notebooks type instance, which is a fully featured GPU compute instance with CUDA and Jupyter Lab pre-loaded and one click away from starting up!

In the sidebar of the main Google Cloud Platform page, select AI Platform > Notebooks



The screenshot shows the Google Cloud Platform main dashboard. On the left, there is a sidebar with various service icons. Under the 'ARTIFICIAL INTELLIGENCE' section, the 'AI Platform' icon is expanded, and its sub-menu includes 'Dashboard', 'AI Hub', 'Data Labeling', and 'Notebooks'. The 'Notebooks' option is highlighted with a blue box. The main content area features a 'Welcome, Mr. Sergey' message and a 'Get started with Google Cloud' section. Below this, there's a 'Begin with the basics' section with a 'GO TO CHECKLIST' button and a 'What's covered' list. Further down, there's a 'Top products' section with 'Compute products' listed, including 'Compute Engine', 'Kubernetes Engine', 'App Engine', 'Cloud Run', and 'Functions'. Each product has a 'GO TO [product]' button and a 'VIEW ALL' button.

You'll have to create a Project first, do it like this:



## New Project

Project name \*

My Project 73895

Project ID: peppy-arcadia-302121. It cannot be changed later. [EDIT](#)

Organization \*

berkeley.edu



Select an organization to attach it to a project. This selection can't be changed later.

Location \*

Learning

[BROWSE](#)

Parent organization or folder

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

Next, click through enabling API...



## Notebooks API

Google

AI Platform Notebooks API is used to manage notebook resources in Google Cloud.

[ENABLE](#)[TRY THIS API](#)[OVERVIEW](#)[DOCUMENTATION](#)

### Overview

AI Platform Notebooks API is used to manage notebook resources in Google Cloud.

### About Google

Google's mission is to organize the world's information and make it universally accessible and useful. Through products and platforms like Search, Maps, Gmail, Android, Google Play, Chrome and YouTube, Google plays a meaningful role in the daily lives of billions of people.

### Additional details

Type: [APIs & services](#)

Last updated: 1/18/21

Category: [Other](#)

Service name: notebooks.googleapis.com

You'll probably end up on the API page, so go back out in the sidebar and select AI Notebooks again.

The screenshot shows the Google Cloud Platform sidebar with the "AI Platform Notebooks API" option highlighted under the "AI Platform" section. The main content area displays the "Overview" page for the Notebooks API, featuring a summary, enablement buttons, and navigation links. A tooltip indicates that credentials are required to use the API. The right side of the screen shows traffic metrics for the API.

You should end up on this page:

Google Cloud Platform My Project 21628

Search products and resources

AI Platform Notebooks NEW INSTANCE REFRESH START STOP RESET UPGRADE DELETE HIDE INFO PANEL

Dashboard AI Hub Data Labeling Notebooks Pipelines Jobs Models

Create and use Jupyter Notebooks with a notebook instance. Notebook instances have JupyterLab pre-installed and are configured with GPU-enabled machine learning frameworks. [Learn more](#)

Filter table

Instance name	Zone	Environment	Machine type	GPUs	Permission	Labels

Info panel DOCUMENTATION LABELS

Notebook instances [Notebook API](#)

You don't have any notebook instances in this project yet

CREATE INSTANCE



And now you can Create Instance, Ubuntu 18.04, Python 3 with CUDA 10.1, with 1 Nvidia V100 GPU. Make sure that the “Install Nvidia GPU driver for me automatically” is selected.



AI Platform



Dashboard



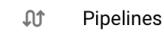
AI Hub



Data Labeling



Notebooks



Pipelines



Jobs



Models

## Create a notebook instance

Instance name \*

work

63-char limit with lowercase letters, digits, or '-' only. Must start with a letter. Cannot end with a '-'.

Region \*

us-west1 (Oregon)

Zone \*

us-west1-b



Requests to your instance from the Datalab/Jupyter interface may be routed through a different region than selected above depending on service availability.

### Environment

All environment have the latest NVIDIA GPU libraries (CUDA, CuDNN, NCCL) and latest Intel® libraries (Intel® MKL\_DNN/MKL) ready to go, along with the latest supported drivers. Select the specific image based on the primary machine learning framework you will be using. If the library you would like to use is not listed, choose the base image, which provides core packages.

Operating System \*

Ubuntu 18.04 [experimental]

Environment \*

Python 3 (with Intel® MKL and CUDA 10.1)

Selected CUDA libraries provided if GPUs are selected. Includes key packages for handling data, such as scikit-learn, pandas, and NLTK.

Select a script to run after creation

BROWSE

### Environment variables

[+ ADD VARIABLE](#)

### Machine configuration

Machine type \*

n1-standard-4 (4 vCPUs, 15 GB RAM)

### GPUs

Based on the zone, framework, and machine type selected above, the available GPU types and the minimum number of GPUs that can be selected may vary. [Learn more](#)

GPU type

NVIDIA Tesla V100

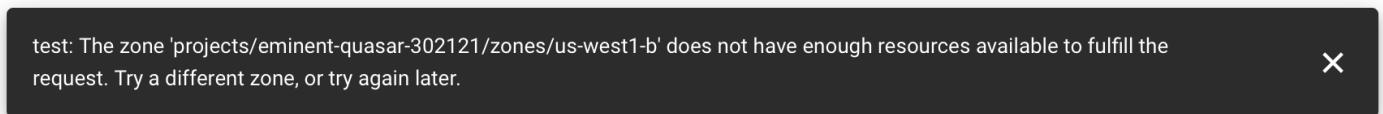
Number of GPUs

1

 Install NVIDIA GPU driver automatically for me

It's \$.75 per hour, so with our \$350 credits, we can compute for almost 780 hours, or twenty 40-hour weeks. We won't be computing that much, but we'll need to be vigilant about shutting down our instance at the end of every session!

You might get this message at the bottom:



In that case, try a K80 GPU, or a different zone.

Unfortunately, we are greeted with this sad message about not having enough quota for GPU usage:

A screenshot of the Google Cloud Platform AI Platform Notebook Instances page. The sidebar shows "Notebooks" is selected. The main area displays a table with columns: Instance name, Region, Environment, Machine type, GPUs, Permission, and Labels. A message at the bottom states: "No notebook instances to display". A small modal window at the bottom center says: "intel-20200402-110233: Quota 'GPUS\_ALL\_REGIONS' exceeded. Limit: 0.0 globally." There is a close button (X) in the top right corner of the modal.

## Apply for GPU quota increase

Go back out to the main Google Cloud Platform page, and in the sidebar select IAM & Admin > Quotas.

The screenshot shows the Google Cloud Platform dashboard for project 'strange-mind-273017'. The left sidebar includes links for Home, AI Platform, Marketplace, Billing, APIs & Services, Support, IAM & Admin, Getting started, Security, Anthos, reCAPTCHA Enterprise, and App Engine. The main area displays activity logs and metrics for Compute Engine, API APIs, and Google Cloud Platform status. A message in the center states: 'You can't request an increase until you upgrade your free trial account.' with a blue 'Upgrade account' button.

Google Cloud Platform

Home

AI Platform

Marketplace

Billing

APIs & Services

Support

IAM & Admin

Getting started

Security

Anthos

reCAPTCHA Enterprise

App Engine

https://console.cloud.google.com/iam-admin/quotas?authuser=1&project=strange-mind-273017

IAM

Identity & Organization

Policy Troubleshooter

Organization Policies

Quotas

Service Accounts

Labels

Settings

Privacy & Security

Cryptographic Keys

Identity-Aware Proxy

TO THIS PROJECT

Roles

Audit Logs

Manage Resources

ACTIVITY

Compute Engine

CPU (%)

No data is available for the selected time frame.

TO THIS PROJECT

Compute Engine

1 instance

Trace

No trace data from the past 7 days

API APIs

Requests (requests/sec)

Google Cloud Platform status

All services normal

Go to Cloud status dashboard

Billing

Estimated charges USD \$0.00  
For the billing period Apr 1 – 6, 2020

View detailed charges

Error Reporting

No sign of any errors. Have you set up Error Reporting?

Learn how to set up Error Reporting

News

Announcing the winners of our Google

You can't request an increase until you upgrade your free trial account.

Upgrade account

If you see a message like the following, please click Upgrade Account.

On the Quotas page, select the GPUs (all regions) metrics only.

Google Cloud Platform > My First Project > IAM & Admin > Quotas

Quota type: All quotas | Service: All services | Metric: All metrics | Location: All locations | Clear

GPU Selection: Select all None

GPU Type	Age	Limit
Committed NVIDIA K80 GPUs	24	2,000
Committed NVIDIA P100 GPUs	7	2,000
Committed NVIDIA P4 GPUs	6	2,000
Committed NVIDIA T4 GPUs	6	2,000
Committed NVIDIA V100 GPUs	5	2,000
GPUs (all regions)	5	2,000
NVIDIA K80 GPUs	5	Unlimited
NVIDIA P100 GPUs	0	1,000
NVIDIA P4 GPUs	0	1,000
NVIDIA P4 Virtual Workstation GPUs	0	1,000
NVIDIA T4 GPUs	0	1,000
NVIDIA T4 Virtual Workstation GPUs	0	1,000
NVIDIA V100 GPUs	0	30
Preemptible NVIDIA K80 GPUs	0	30

Quotas (List requests per 100 seconds):

- Compute Engine API: Operation read requests per 100 seconds (Global, Limit: 2,000)
- Compute Engine API: Queries per 100 seconds (Global, Limit: 2,000)
- Compute Engine API: Queries per day (Global, Limit: Unlimited)
- Compute Engine API: Heavy-weight read requests per 100 seconds (Global, Limit: 2,000)
- Compute Engine API: Heavy-weight mutation requests per 100 seconds (Global, Limit: 2,000)
- Compute Engine API: Instance SimulateMaintenanceEvent requests per day (Global, Limit: 200)
- Compute Engine API: Instance SimulateMaintenanceEvent requests per 100 seconds (Global, Limit: 200)
- Compute Engine API: License insert requests per day (Global, Limit: 30)
- Compute Engine API: License insert requests per 100 seconds (Global, Limit: 200)
- Compute Engine API: Instance List Referrer requests per 100 seconds (Global, Limit: 4,000)
- Compute Engine API: Autoscalers (asia-east1, Limit: 50)
- Compute Engine API: Autoscalers (asia-east2, Limit: 50)
- Compute Engine API: Autoscalers (asia-northeast1, Limit: 50)
- Compute Engine API: Autoscalers (asia-northeast2, Limit: 50)

Select the GPUs (all regions) metric and click Edit Quotas, then request an increase to 2 GPUs, with the reason that you're a student in the Berkeley Full Stack Deep Learning course (<https://bit.ly/berkeleyfsdl>).

The screenshot shows the Google Cloud Platform IAM & Admin Quotas interface. The left sidebar lists various administrative services: IAM, Identity & Organization, Policy Troubleshooter, Organization Policies, Quotas (selected), Service Accounts, Labels, Settings, Privacy & Security, Cryptographic Keys, Identity-Aware Proxy, Roles, and Audit Logs. The main content area is titled "Quotas" and "EDIT QUOTAS". It displays a table with columns: Quota type (All quotas), Service (All services), Metric (GPUs (all regions)), and Location (All locations). A "Clear" button is available. Below this, a "Service" section is expanded, showing "Compute Engine API" with a "Global" location and a limit of "0". The status bar indicates "1 quota selected". On the right, a modal window for the "Compute Engine API" quota is open, titled "Quota: GPUs (all regions)". It contains a "New quota limit" input field set to "2", a "Request description" input field containing "I am in a deep learning course at the University of Washington Professional Master's Program: https://bit.ly/uwfsdl", and "Done" and "Cancel" buttons. At the bottom of the modal is a "Submit request" button.

They can be quite quick at approving the request: took only 3 minutes for me:

[#22832386] Quota Increase Request For strange-mind-273017 [ref:\_00D00VNwG\_5005w1XmKsB:ref] ➤ [Inbox](#)

⋮ ⌂ ⌃

Google Cloud Platform Support

Hello, Thank you for contacting Google Cloud Platform Support. This message is to confirm that we've received your quota request for project 'strange-mind-273017'.

11:29 AM (3 minutes ago) ⌂ ⌃



Google Compute Engine Quota Support <esupport@google.com>

to sergeyk ⌂

11:31 AM (2 minutes ago) ⌂ ⌃ ⌂ ⌃

Hello,

Your quota request for project '675093467129' has been approved and your quota has been adjusted accordingly.

Changed Quota:

```
+-----+  
| GLOBAL Attribute | GPUS_ALL_REGIONS |  
+-----+  
| Changes | 0 -> 2 |  
+-----+
```

Please visit

<https://console.cloud.google.com/iam-admin/quotas?project=675093467129&service=compute.googleapis.com>

to review your updated quota.

Happy Computing!

Google Cloud Platform Support

<http://support.google.com/enterprisehelp/>

## Starting up the instance for real

Now go back to AI Platform > Notebooks, and try to start up the instance again, as described before.

The screenshot shows the Google Cloud Platform AI Platform interface, specifically the Notebooks section. On the left, there's a sidebar with options like Dashboard, AI Hub, Data Labeling, Pipelines, Notebooks (which is selected), Jobs, and Models. The main area is titled "Notebook instances" and shows a table with one row. The table columns are: Instance name (with a checkbox and a green checkmark next to "intel-20200402-113600"), OPEN JUPYTERLAB, Region (us-west-1-b), Environment (CUDA:10.1), Machine type (4 vCPUs, 15 GB RAM), GPUs (NVIDIA Tesla K80 x 1), Permission (Service account), and Labels. There are also buttons for NEW INSTANCE, REFRESH, START, STOP, RESET, and DELETE. To the right of the table, there's a panel titled "Select a notebook instance" with a note about labels and an "Empty Tab" button.

When the instance starts up, click the Open Jupyterlab button.

The screenshot shows the Google Cloud Platform interface for managing notebook instances. On the left, there's a sidebar with various AI Platform services like Dashboard, AI Hub, Data Labeling, Pipelines, and Notebooks (which is selected). The main area is titled "Notebook instances" and shows a table with one row. The row details an instance named "intel-20200402-113600" which is currently "OPEN JUPYTERLAB". It's located in the "us-west1-b" region, has a "CUDA:10.1" machine type, 4 vCPUs, 15 GB RAM, and an NVIDIA Tesla K80 x 1 GPU. The permission is set to "Service account". A "Labels" column is present but empty. There are buttons for "NEW INSTANCE", "REFRESH", "START", "STOP", "RESET", and "DELETE". To the right, there's a panel titled "Select a notebook instance" with a note about labels and an "Empty Tab" button.

Voila, you now have our compute environment ready to go. Starting a terminal and running `nvidia-smi` shows that we have our K80 ready to go.

The screenshot shows a JupyterLab interface with a terminal tab open. The terminal window title is "jupyter@intel-20200402-113600:~" and it displays the output of the "nvidia-smi" command. The output shows the following information:

```
jupyter@intel-20200402-113600:~$ nvidia-smi
Thu Apr  2 18:47:06 2020
+-----+
| NVIDIA-SMI 418.87.01 Driver Version: 418.87.01 CUDA Version: 10.1 |
+-----+
| GPU Name Persistence-M Bus-Id Disp.A Volatile Uncorr. ECC |
| Fan Temp Perf Pwr:Usage/Cap Memory-Usage GPU-Util Compute M. |
|-----+
| 0 Tesla K80 Off 00000000:00:04.0 0% 0MiB / 11441MiB | 100% Default |
| N/A 43C P0 66W / 149W 0MiB / 11441MiB | 100% Default |
+-----+
| Processes: GPU PID Type Process name GPU Memory Usage |
|-----+
| No running processes found |
+-----+
jupyter@intel-20200402-113600:~
```

(For those who want to, you can still connect to the instance in the normal SSH way.)

## Set up the project repo

Now we should get the project code repo going.

### Set up Github key

First, generate an SSH key for your instance.

...

```
ssh-keygen  
# Press Enter three times  
cat ~/.ssh/id_rsa.pub  
...
```

Paste what is printed into <https://github.com/settings/ssh/new>.

### Set up git-lfs

We use git-lfs for seamlessly storing large files (e.g. data) in the repository.

...

```
curl -s https://packagecloud.io/install/repositories/github/git-lfs/script.deb.sh | sudo bash  
sudo apt-get install git-lfs  
git lfs install  
...
```

### Check out the project repo

Now you're ready to clone the project repo.

Check out

<https://github.com/full-stack-deep-learning/fsdl-text-recognizer-2021-labs/blob/main/setup/readme.md> for further instructions.