

OPS 813: Cloud Computing

-Today's plan:

- 0) Attendance & Syllabus
- 1) Discuss Textbook
- 2) Google Cloud Study Jam – Qwik Labs
- 3) Homework #1: Time to get a badge
- 4) Helpful Linux Commands
- 5) Setup your own instance

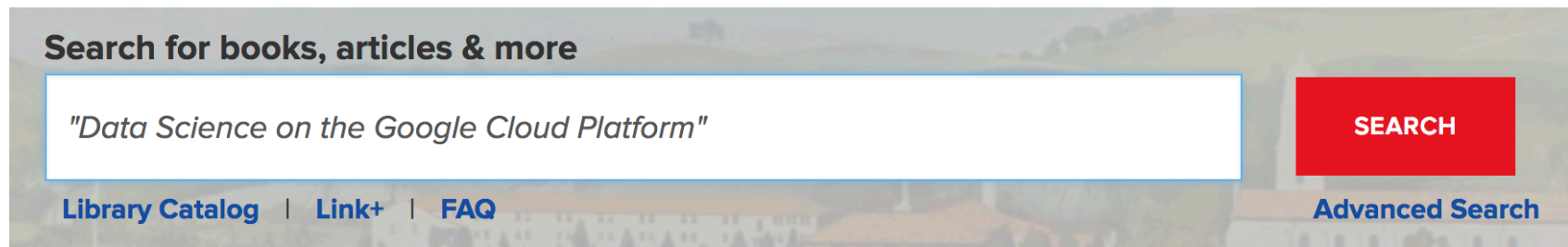
Attendance & Syllabus

As I take attendance, when I call your name, offer your thoughts on the following **discussion questions**:

- 1) What is Cloud Computing?
- 2) Why is Cloud Computing relevant for data analytics?
- 3) What percentage of jobs in the data analytics space does Cloud Computing benefit?

Textbook

- Visit <https://www.stmarys-ca.edu/library>
- Type “Data Science on the Google Cloud Platform” in the search box:



Search for books, articles & more

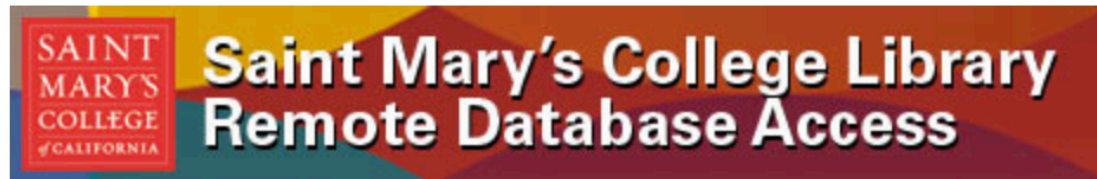
"Data Science on the Google Cloud Platform"

[Library Catalog](#) | [Link+](#) | [FAQ](#)

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[Advanced Search](#)

- After clicking Search, you will be asked to log in:



Student, Faculty, and Staff Login

SMC username:

@stmarys-ca.edu

Password:

Login

Textbook

- After logging in, you will see the following– make sure to click here:

1. **Data Science on the Google Cloud Platform : Implementing End-to-End Real-Time Data Pipelines: From Ingest to Machine Learning**



eBook

By: Lakshmanan, Valliappa. Edition: First edition. Sebastopol, CA : O'Reilly Media. 2018. eBook., Database: [eBook Collection \(EBSCOhost\)](#)

Subjects: COMPUTERS / **Data** Processing; COMPUTERS / Databases / General; COMPUTERS / **Data** Modeling & Design; **Cloud** computing; Real-time **data** processing; Computing platforms



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Author: Lakshmanan, Valliappa

Date: 2018

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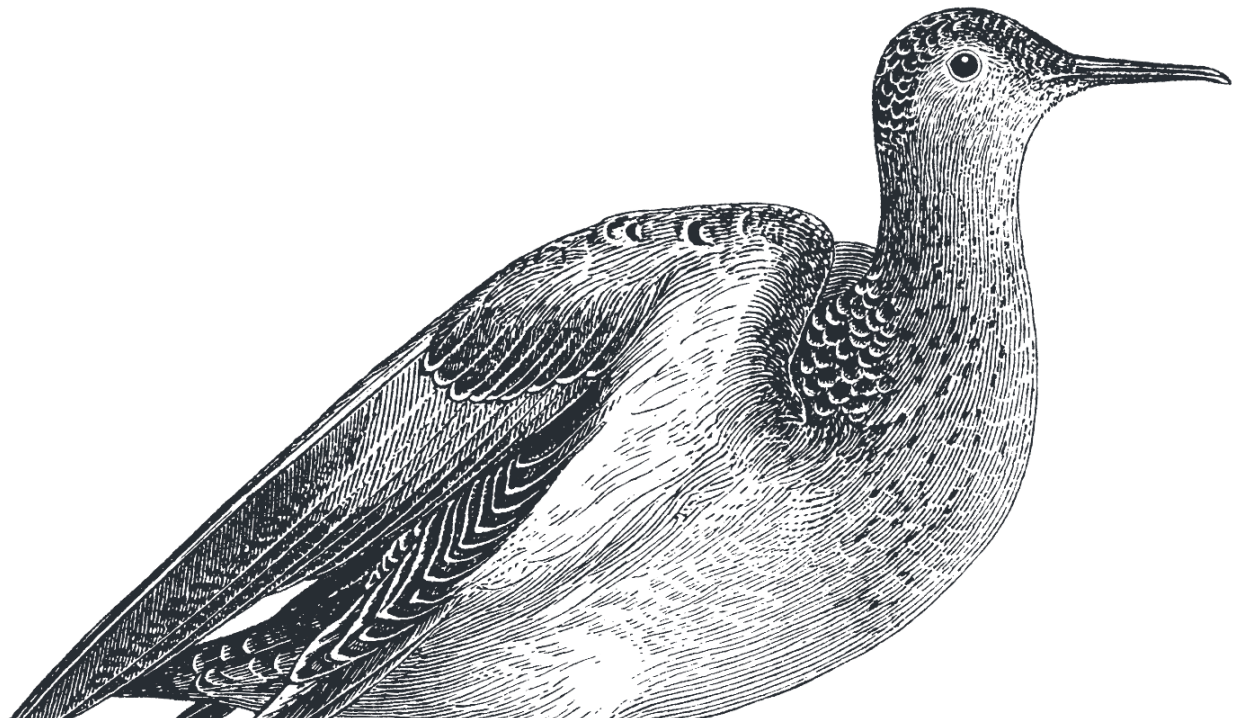
► Preface

► Chapter 1. Making Better Decisions Based on Data

► Chapter 2. Ingesting Data into the Cloud





► Chapter 3. Creating Compelling


O'REILLY®




Textbook

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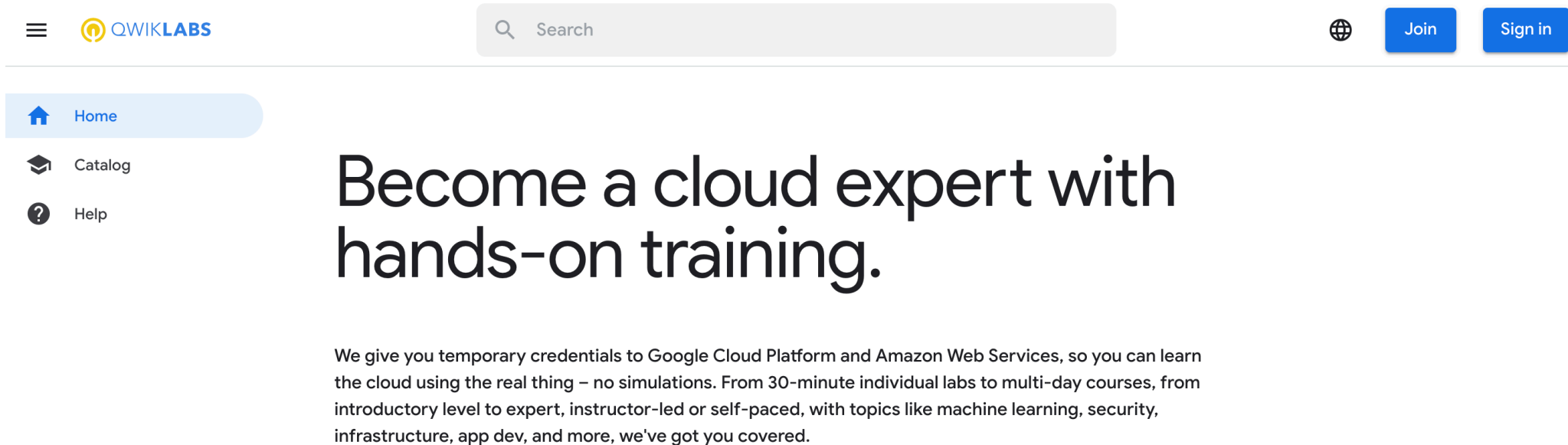
☒ This section: 408 pages

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- This will download the pdf file onto your computer. Please look to find it. It should be called ebscohost.pdf

Google Cloud Study Jam – Qwik Labs

Google has provided a GCP Education Grant for you to experiment. Before using your credits, lets practice by using Qwik Labs:

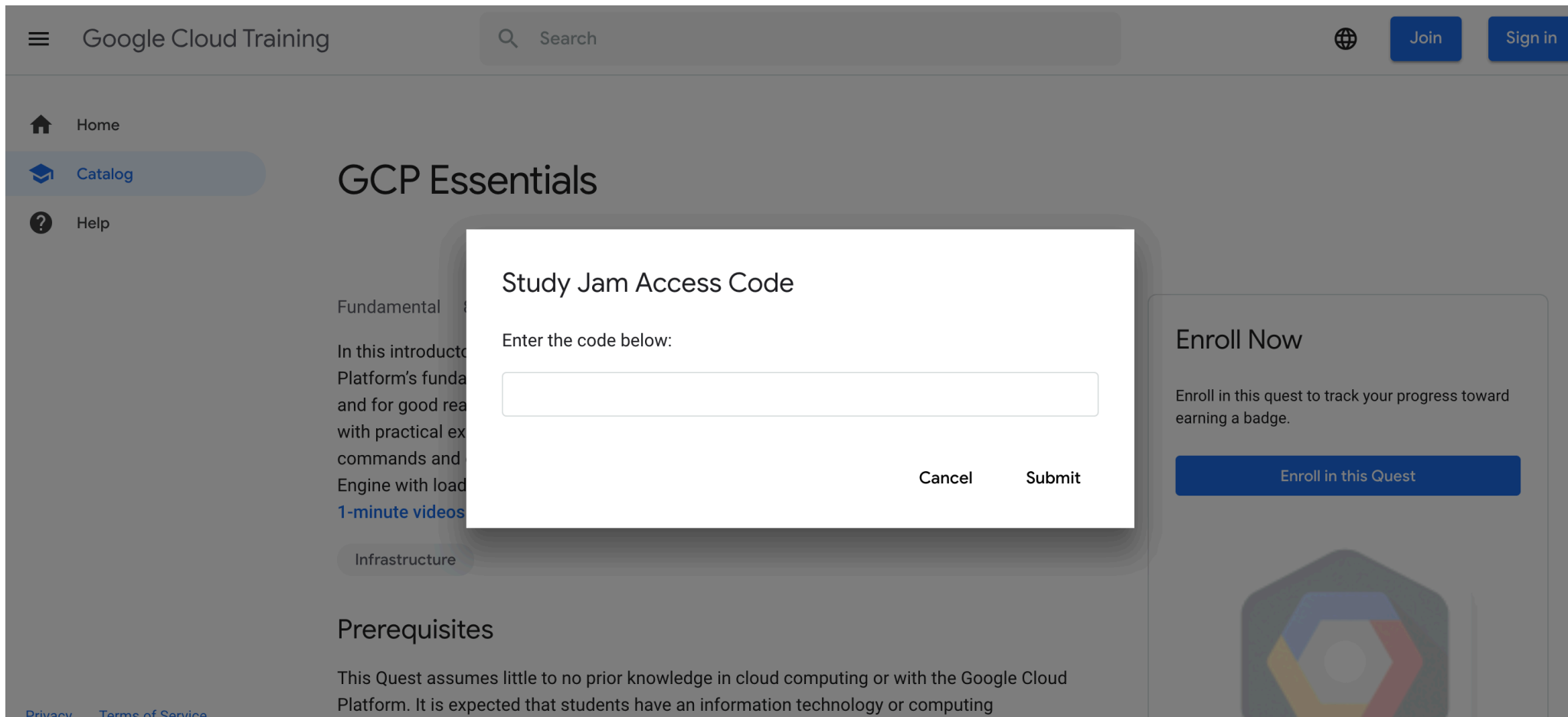


- 1) First visit the site:
<https://www.qwiklabs.com>
- 2) Click on Join and use your @stmarys-ca.edu email address.

Google Cloud Study Jam – Qwik Labs

2) We are going to get you started on your first Quest: **GCP Essentials**.
Click on the link below

<http://blog.qwiklabs.com/study-jam-1/>



The screenshot shows the Google Cloud Training interface. At the top, there's a navigation bar with 'Google Cloud Training', a search bar, and 'Join'/'Sign in' buttons. A sidebar on the left contains 'Home', 'Catalog', and 'Help'. The main content area is titled 'GCP Essentials' and includes a description of the quest, a 'Fundamental' section, and a 'Prerequisites' section. A modal window titled 'Study Jam Access Code' is centered on the screen, prompting the user to 'Enter the code below:' with a text input field and 'Cancel'/'Submit' buttons. To the right of the modal, there's an 'Enroll Now' section with a description and an 'Enroll in this Quest' button.

Google Cloud Training

Search

Join Sign in

Home Catalog Help

GCP Essentials

Fundamental

In this introductory quest, you'll learn the Google Cloud Platform's fundamental concepts and for good reason, this quest is designed with practical examples, hands-on labs, and commands and Engine with load

1-minute videos

Infrastructure

Prerequisites

This Quest assumes little to no prior knowledge in cloud computing or with the Google Cloud Platform. It is expected that students have an information technology or computing

Study Jam Access Code

Enter the code below:

Cancel Submit

Enroll Now

Enroll in this quest to track your progress toward earning a badge.

Enroll in this Quest

3) Enter the code: **1s-moraga-5561** and click Submit and “Enroll in...”

Google Cloud Study Jam – Qwik Labs

4) Click on the first lab:

GCP Essentials

Quest Outline

HANDS-ON LAB

[A Tour of Qwiklabs and the Google Cloud Platform](#)

In this first hands-on lab you will access Qwiklabs and the Google Cloud Platform Console and use the basic GCP features: Projects, Resources, IAM Users, Roles, Permissions, APIs, and Cloud Shell.



45m

Introductory

Free



HANDS-ON LAB

[Creating a Virtual Machine](#)

In this hands-on lab, you'll learn how to create a Google Compute Engine virtual machine and understand zones, regions, and machine types. To preview, watch the short video [Create a Virtual Machine, GCP Essentials](#).



40m

Introductory

1 Credit



OR

HANDS-ON LAB

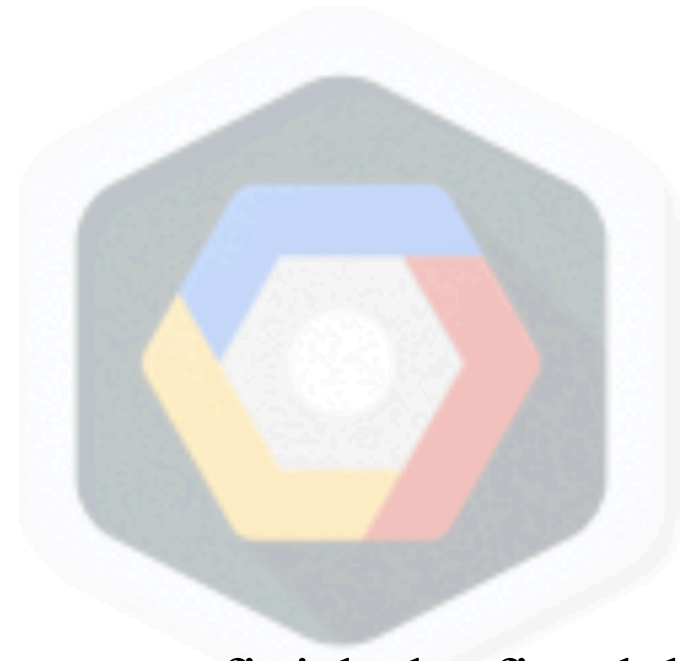
[Compute Engine: Qwik Start - Windows](#)

Google Compute Engine lets you create and run virtual machines on Google infrastructure. In this lab you create a Windows Server instance in the Google Compute

Google Cloud Study Jam – Qwik Labs

5) I'll be walking around as you finish the first lab.

6) By the way, your homework #1 is to obtain a badge for completing this entire Quest (all the labs in this Quest).



7) Now using Zoom, please share your screen as you finish the first lab.

8) After you finish the first lab, please follow these instructions:

https://support.google.com/qwiklabs/answer/9222527?hl=en&ref_topic=9139328 and email me (ns27) the link to your public profile.

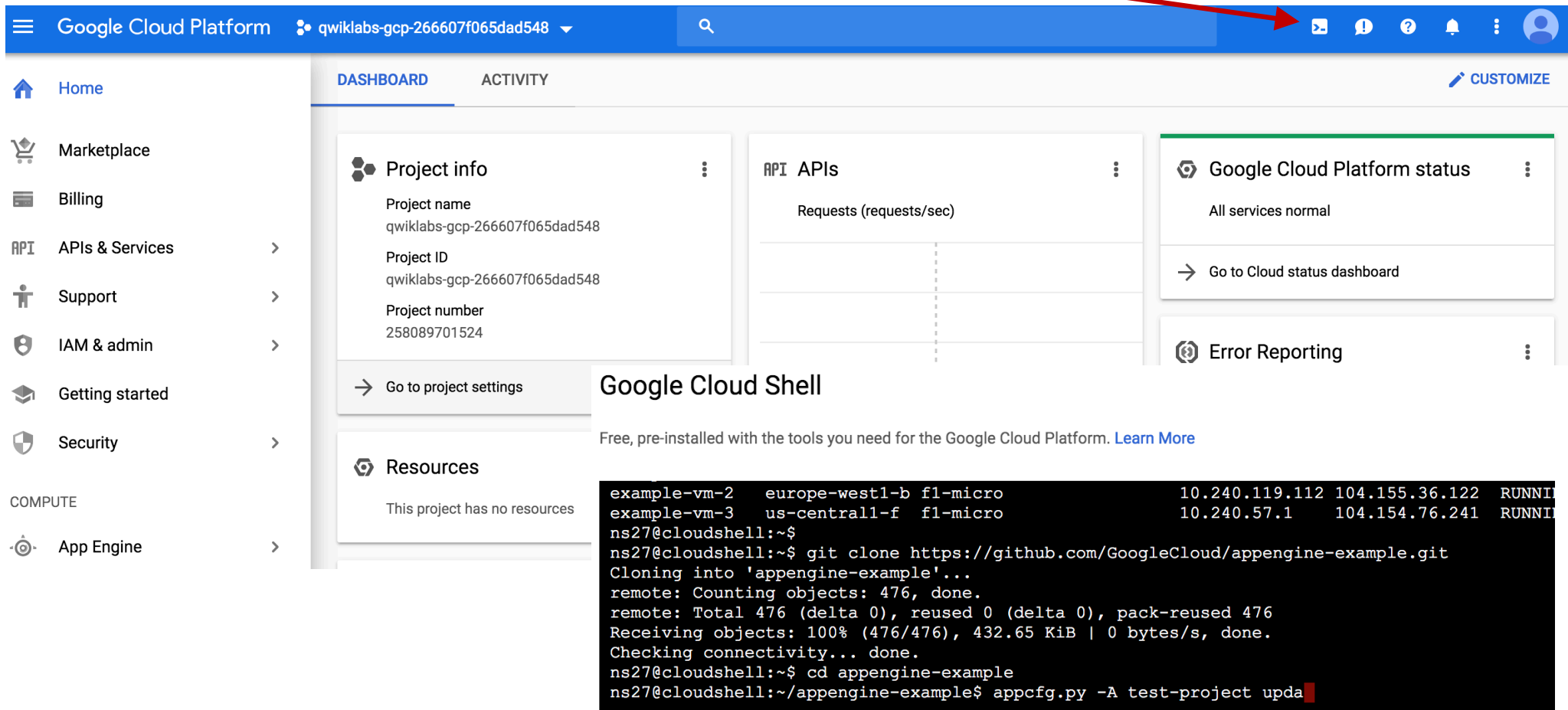
HW #1 – GCP Essentials Quest & Readings

By our next session, please finish the GCP Essentials Quest and obtain the badge for it. Also, make sure to read Chapters 1 and 2 of the “Data Science on the GCP” textbook.



Helpful Linux Commands

Let's quickly get to a linux command prompt using the Google Cloud Shell.



The screenshot shows the Google Cloud Platform dashboard for project 'qwiklabs-gcp-266607f065dad548'. A red arrow points from the text 'using the Google Cloud Shell' to the Google Cloud Shell icon in the top right navigation bar. The dashboard includes sections for Project info, API APis, Google Cloud Platform status, and Error Reporting. The Google Cloud Shell section is highlighted, showing a terminal window with the following commands and output:

```
example-vm-2 europe-west1-b f1-micro 10.240.119.112 104.155.36.122 RUNNI
example-vm-3 us-central1-f f1-micro 10.240.57.1 104.154.76.241 RUNNI
ns27@cloudshell:~$
ns27@cloudshell:~$ git clone https://github.com/GoogleCloud/appengine-example.git
Cloning into 'appengine-example'...
remote: Counting objects: 476, done.
remote: Total 476 (delta 0), reused 0 (delta 0), pack-reused 476
Receiving objects: 100% (476/476), 432.65 KiB | 0 bytes/s, done.
Checking connectivity... done.
ns27@cloudshell:~$ cd appengine-example
ns27@cloudshell:~/appengine-example$ appcfg.py -A test-project update
```

Real Linux environment

- Linux Debian-based OS
- 5GB persisted home directory
- Add, edit and save files

Configured for Google Cloud

- Google Cloud SDK
- Google App Engine SDK
- Docker
- Git
- Text editors
- Build tools
- View more [↗](#)

Popular language support

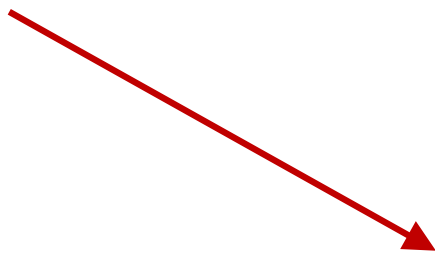
- Python
- Java
- Go
- Node.js

Helpful Linux Commands

ls	Lists files in the current location
ls -lat	Lists files using additional options l,a,t
man	Manual for a command
pwd	Present working directory
cd ..	Change directory to .. (.. is one level up vs . is the pwd)
cd ~	Change directory to ~ (abbreviation for home directory)
cd /	Change directory to the root of the file tree , i.e., /
w	Who is using machine
grep	Searching text for patterns
nano	Text editor
	Pipe command that allows you to send the output of one command to be the input to the next command

Setup your own instance

1) Please check your email and click on this link:



Dear Students,

Here is the URL you will need to access in order to request a Google Cloud Platform coupon. You will be asked to provide your school email address and name. An email will be sent to you to confirm these details before a coupon is sent to you.

[Student Coupon Retrieval Link](#)

- You will be asked for a name and email address, which needs to match the domain. A confirmation email will be sent to you with a coupon code.
- You can request a coupon from the URL and redeem it until: **6/12/2019**
- Coupon valid through: **2/12/2020**
- You can only request ONE code per unique email address.

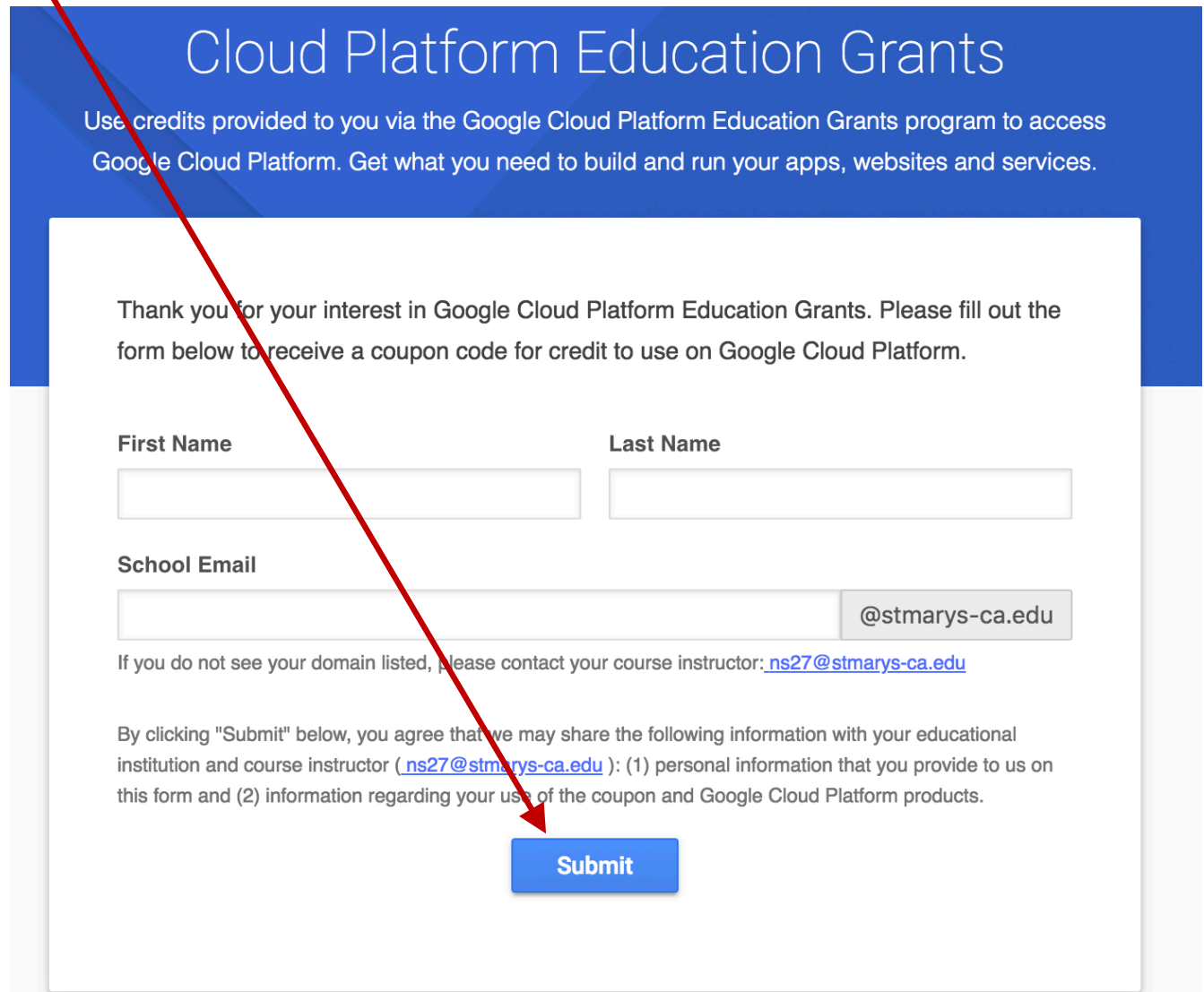
Please contact me if you have any questions or issues.

Thanks,

Prof. Navid Sabbaghi

Setup your own instance

2) Now type in your first and last name and provide your SMC email and submit



Cloud Platform Education Grants

Use credits provided to you via the Google Cloud Platform Education Grants program to access Google Cloud Platform. Get what you need to build and run your apps, websites and services.

Thank you for your interest in Google Cloud Platform Education Grants. Please fill out the form below to receive a coupon code for credit to use on Google Cloud Platform.

First Name

Last Name

School Email

If you do not see your domain listed, please contact your course instructor: ns27@stmarys-ca.edu

By clicking "Submit" below, you agree that we may share the following information with your educational institution and course instructor (ns27@stmarys-ca.edu): (1) personal information that you provide to us on this form and (2) information regarding your use of the coupon and Google Cloud Platform products.

Submit

Setup your own instance

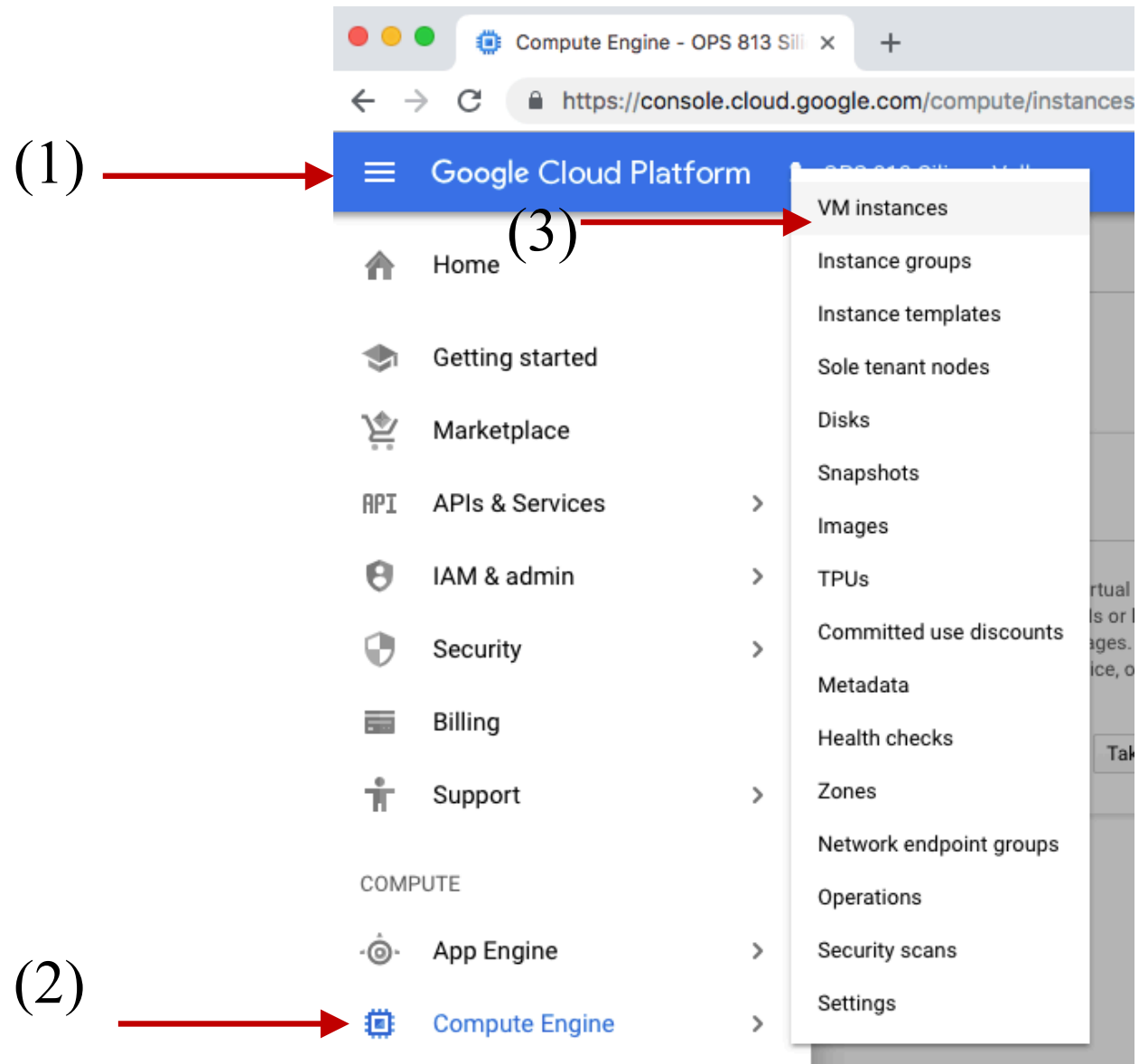
3) Congratulations, you now have \$50 of credit to use the Google Cloud. Please be careful— this can be used quickly.

In particular, please make sure to **turn off** your instance after you are done using them otherwise you will continue getting billed for it and use up all your funding.

Curious about the costs? Please visit
<https://cloud.google.com/compute/pricing>

4) Let's setup your instance.

Setup your own instance



(4) Then click on Create in the popup window.

Setup your own instance

- Now click on ‘Create new instance’.
- Name your instance, select zone as ‘us-west1 (Oregon)’.
- Choose your ‘machine type’. (I chose 1vCPU for now).
- Select your boot disk as ‘Ubuntu 16.04 LTS’.
- Change the Size of the Boot disk to 30 GB.
- Allow full access to all Cloud APIs.
- Under the firewall options tick both ‘http’ and ‘https’ (very important).
- Click **Create**.


Name ?
cloudexample

Region ?
us-west1 (Oregon)

Zone ?
us-west1-b

Machine type
Customize to select cores, memory and GPUs.
1 vCPU 3.75 GB memory [Customize](#)

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

Boot disk ?
 New 30 GB standard persistent disk
Image
Ubuntu 16.04 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

Setup your own instance

<input type="checkbox"/>	Name ^	Zone	Recommendation	Internal IP	External IP	Connect
<input type="checkbox"/>	<input checked="" type="checkbox"/> clouDEXample	us-west1-b		10.138.0.3 (nic0)	None	SSH ▾ ⋮

Make external IP address static
(a)

Looking for
OFF button?

(b)

(c)

The image shows a screenshot of the Google Cloud Platform (GCP) interface. At the top, there is a blue header bar with the text "Google Cloud Platform" and "OPS 813 Silicon Valley". Below this is a navigation menu with various icons and labels: Home, Kubernetes Engine, Cloud Functions, STORAGE, Bigtable, Datastore, Firestore, Storage, SQL, Spanner, Memorystore, Filestore, NETWORKING, VPC network, and Network services. A red arrow points from the text "(a)" to the "VPC network" label. Another red arrow points from the text "(b)" to the "Network services" label. A third red arrow points from the text "(c)" to the "VPC networks" sub-menu item, which is expanded to show "VPC networks", "External IP addresses", and "Firewall rules".

Setup your own instance

1) Click on type for your VM instance and choose "Static". Then choose a static IP address, e.g., "myaddress".

<input type="checkbox"/>	Name	External Address	Region	Type ▾	Version	In use by	Network Tier ?	Labels
<input type="checkbox"/>	anything	35.203.171.61	us-west1	Static	IPv4	None	Premium	
<input type="checkbox"/>	—	35.185.193.0	us-west1	<div>Static Ephemeral</div>	IPv4	VM instance <u>cloudexample</u> (Zone b)		

2) Let's add firewall rules to control who gets into the instance.

(a) →

(b) →

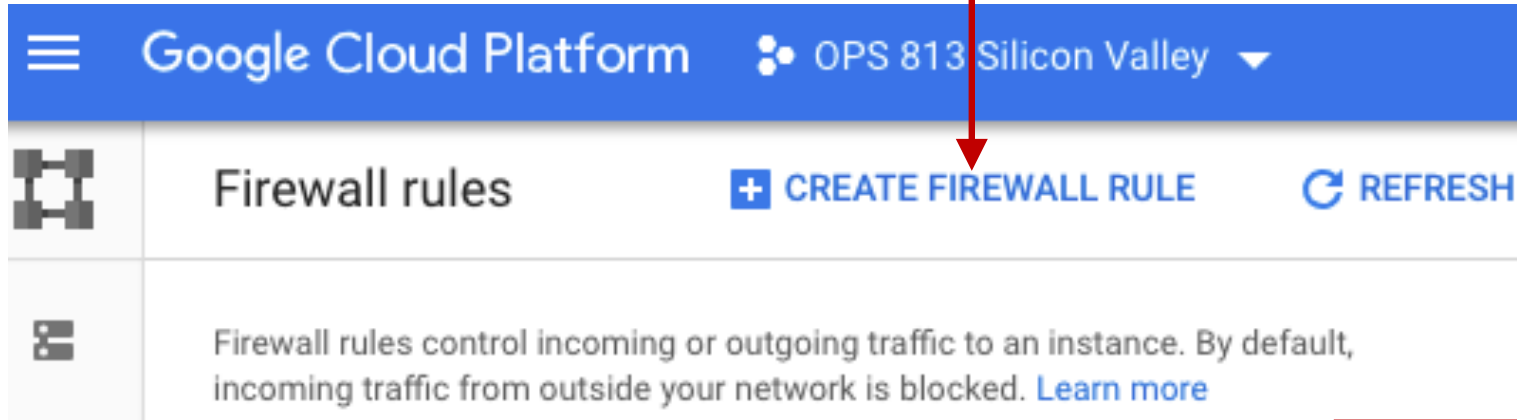
(c) →

The screenshot shows the Google Cloud Platform navigation menu. The menu is open, displaying various services. The 'VPC network' option is highlighted, and its sub-menu is visible, showing 'VPC networks', 'External IP addresses', 'Firewall rules', 'Routes', 'VPC network peering', and 'Shared VPC'. The 'Firewall rules' option is highlighted in the sub-menu.

- Google Cloud Platform
- OPS 813 Silicon Valley
- Home
- Memorystore
- Filestore
- NETWORKING
 - VPC network
 - VPC networks
 - External IP addresses
 - Firewall rules
 - Routes
 - VPC network peering
 - Shared VPC
 - Network services
 - Hybrid Connectivity
 - Network Service Tiers
 - Network Security

Setup your own instance

1) Click on Create Firewall Rule



2) Set up the firewall rule according to this screenshot:

And then click Create.

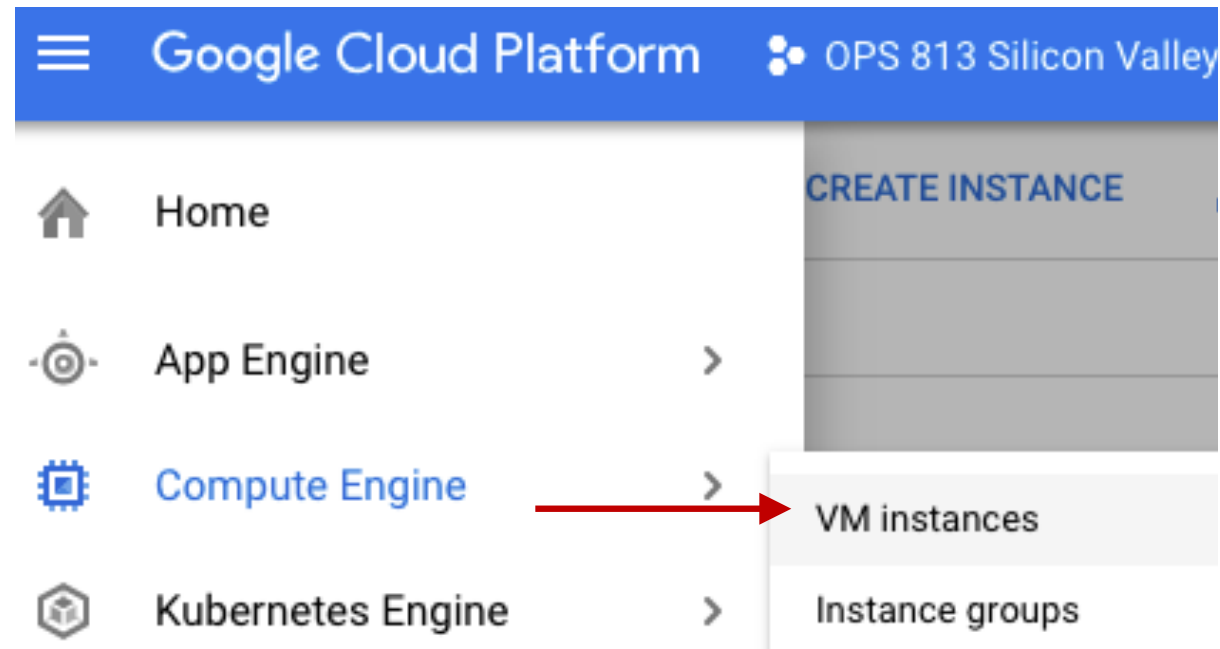
The screenshot shows the configuration form for a Firewall rule. The form includes the following fields and options:

- Network**: default
- Priority**: 1000 (Priority can be 0 - 65535 [Check pri](#))
- Direction of traffic**: ☒ Ingress, ☐ Egress
- Action on match**: ☒ Allow, ☐ Deny
- Targets**: All instances in the network
- Source filter**: IP ranges
- Source IP ranges**: 0.0.0.0/0 (with a close button)
- Second source filter**: None
- Protocols and ports**: ☐ Allow all, ☒ Specified protocols and por
 - ☒ tcp : 5000

Red arrows point to the 'All instances in the network' target, the '0.0.0.0/0' source IP range, and the 'Specified protocols and ports' option with 'tcp : 5000'.

Setup your own instance

1) Now lets **use** the instance



2) Click on Open in browser window:



Setup your own instance

1) Remember to turn the instance **OFF** after you are done or you will lose up all your cloud credits.

<input type="checkbox"/>	Name ^	Zone	Recommendation	Internal IP	External IP	Connect	
<input type="checkbox"/>	<input checked="" type="checkbox"/> <u>cloudexample</u>	us-west1-b		10.138.0.3 (nic0)	<u>35.185.193.0</u> ↗	SSH ▾	<div><div>⋮</div><div>Start</div><div>Stop</div><div>Reset</div><div>Delete</div><div>View network c</div><div>View logs</div></div>

