

https://npu85.npu.edu/~henry/npu/classes/cloud_computing/gke/slide/exercise_gke.html

Q4 ==> Running the Python Bookshelf on Kubernetes Engine - Flask Web Framework

The project will involve the following technologies

1. Flask - A Python-based Web Framework
2. Container Technology
3. Google Kubernetes Engine (GKE)

You will learn from this project to build your own Flask-based web server and package the web server using Kubernetes container technology.

4. [Running the Python Bookshelf on Kubernetes Engine - Flask Web Framework](#) □ □

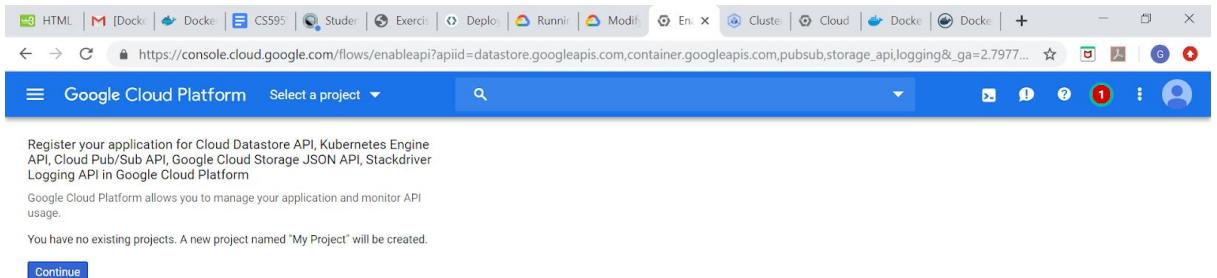
- References

- [Python for GKE](#)
- [Deploying Applications Using Google Kubernetes Engine](#) □ □
- [Try Google Cloud Platform for free](#)
- [Python Getting Started on Google Cloud Platform tutorials](#)

1. [GO TO THE MANAGE RESOURCES PAGE](#)

The screenshot shows the Google Cloud Platform interface. At the top, there's a navigation bar with various icons like HTML, Docker, and CS595V. Below it is a banner for a free trial. The main header says "Google Cloud Platform". Underneath, there's a "Manage resources" section with a table. The table has columns for Name, ID, Status, Requests, Errors, Charges, Labels, and Actions. One row is visible: "mail.npu.edu" with ID "831774947012". At the bottom of the table, it says "RESOURCES PENDING DELETION". To the right of the table, there's a sidebar with sections for "PERMISSIONS", "LABELS", and "ACTIVITY". A message box says "Please select at least one resource." At the very bottom, there's a taskbar with the Windows logo, a search bar, and several pinned icons.

2. Make sure that billing is enabled for your Google Cloud Platform project.



LEARN HOW TO ENABLE BILLING

3. Enable the Cloud Datastore, GKE, Cloud Storage, and Cloud Pub/Sub APIs.
ENABLE THE APIs

```
All components are up to date.
ren10531@cloudshell:~$ gcloud config list
[component_manager]
disable_update_check = True
[compute]
gce_metadata_read_timeout_sec = 5
zone = us-east1-b
[core]
account = ren10531@mail.npu.edu
disable_usage_reporting = False
project =
[metrics]
environment = devshell
Your active configuration is: [cloudshell-32698]
ren10531@cloudshell:~$
```

4. Install and initialize the Cloud SDK.

Your free trial is waiting: activate now to get \$300 credit to explore Google Cloud products. [Learn more](#)

DISMISS ACTIVATE

Google Cloud Platform

Select a project

Get Started with Google Cloud Platform

12 month, \$300 free trial to get you started.
Always Free products to keep you going

TRY FOR FREE

Top Products

- Compute Engine
- Cloud Storage
- Cloud SQL
- App Engine

Scalable, high-performance virtual machines
A powerful, simple and cost effective object storage service
A fully-managed MySQL/PostgreSQL database service
A platform to build apps that scale automatically

COMPUTE

- App Engine
- Compute Engine

Type here to search

10:27 PM 6/19/2019

Your free trial is waiting: activate now to get \$300 credit to explore Google Cloud products. [Learn more](#)

DISMISS ACTIVATE

Google Cloud Platform

Select a project

Kubernetes Engine

Clusters

To view this page, select a project.

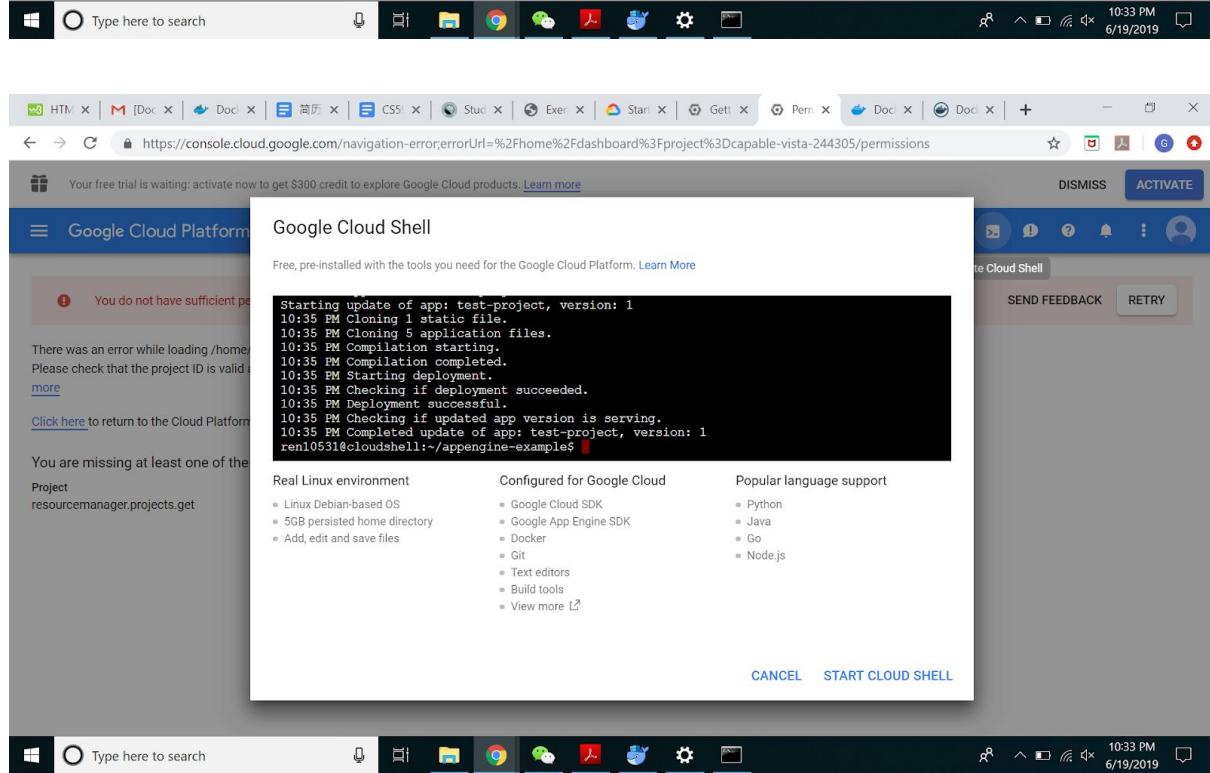
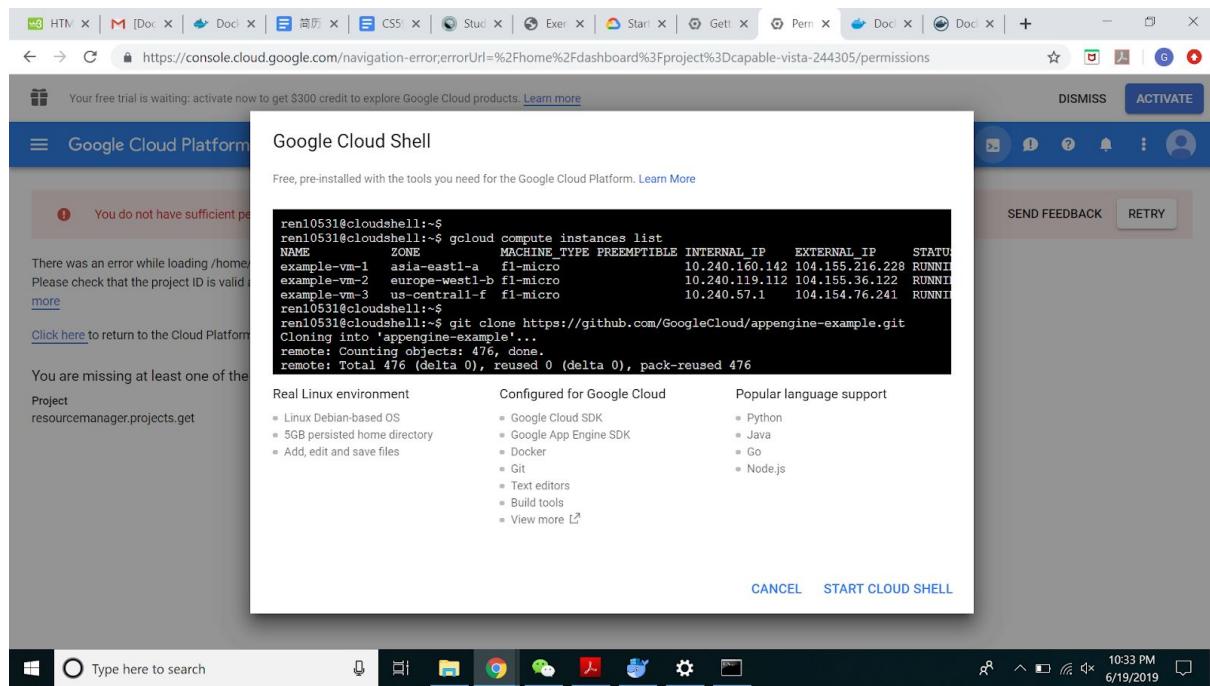
CREATE

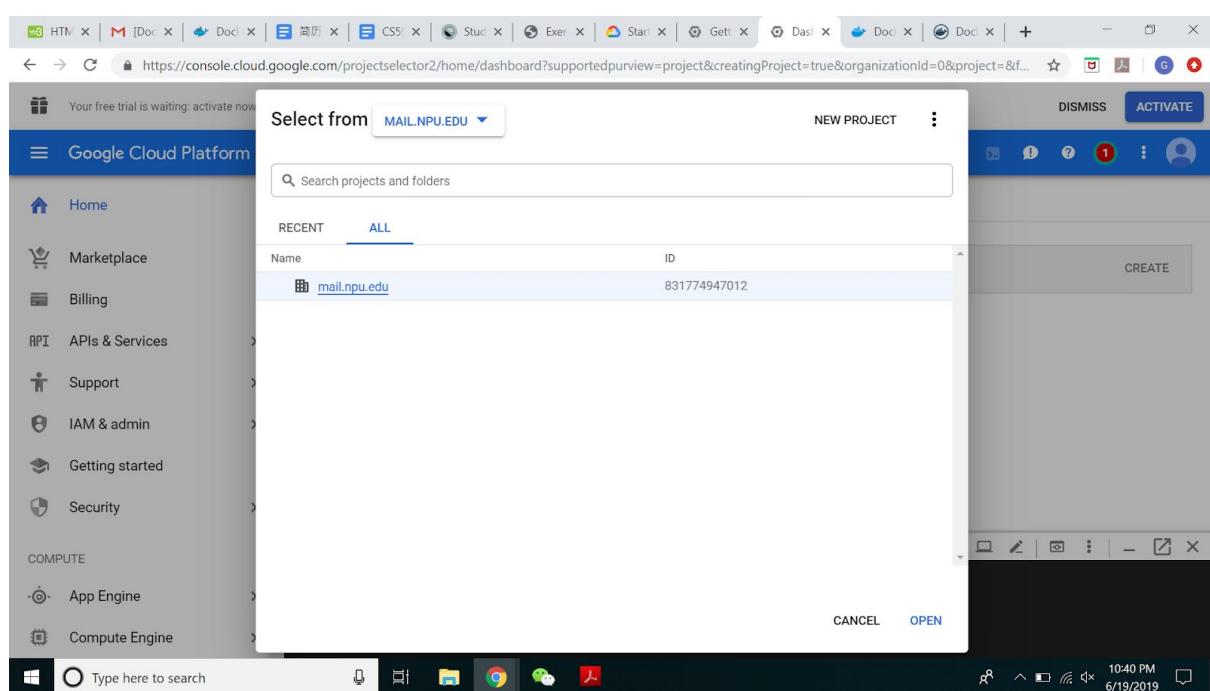
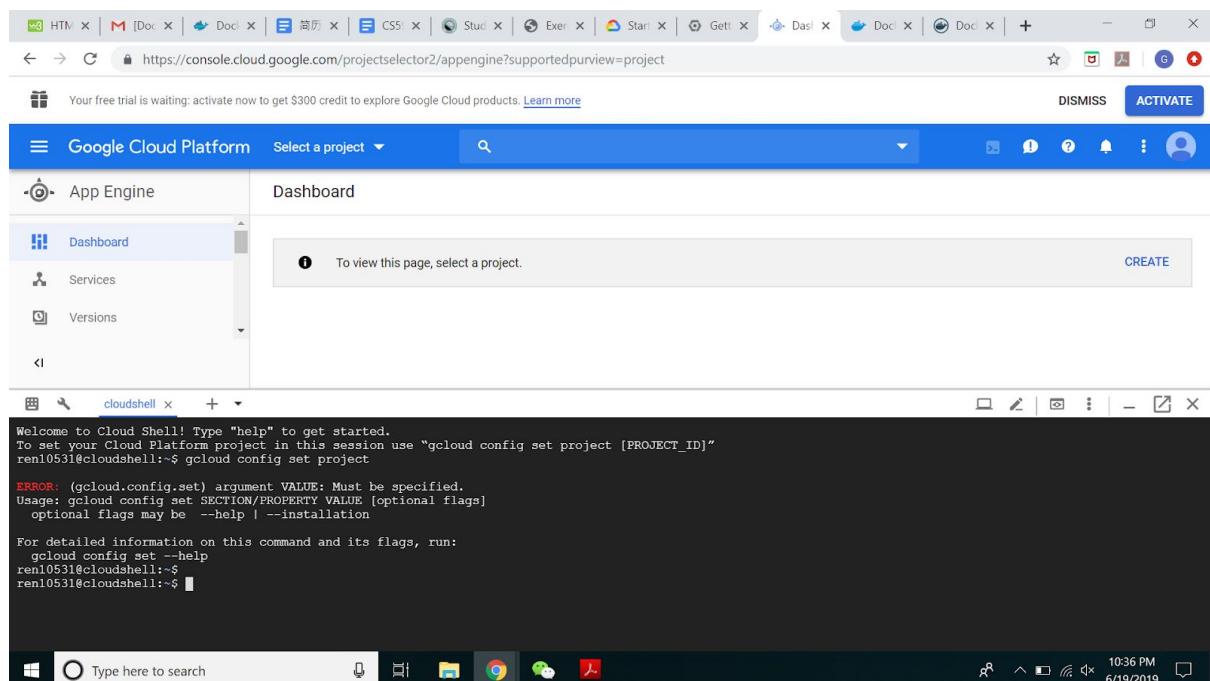
- Clusters
- Workloads
- Services
- Applications
- Configuration
- Storage

Marketplace

Type here to search

10:28 PM 6/19/2019



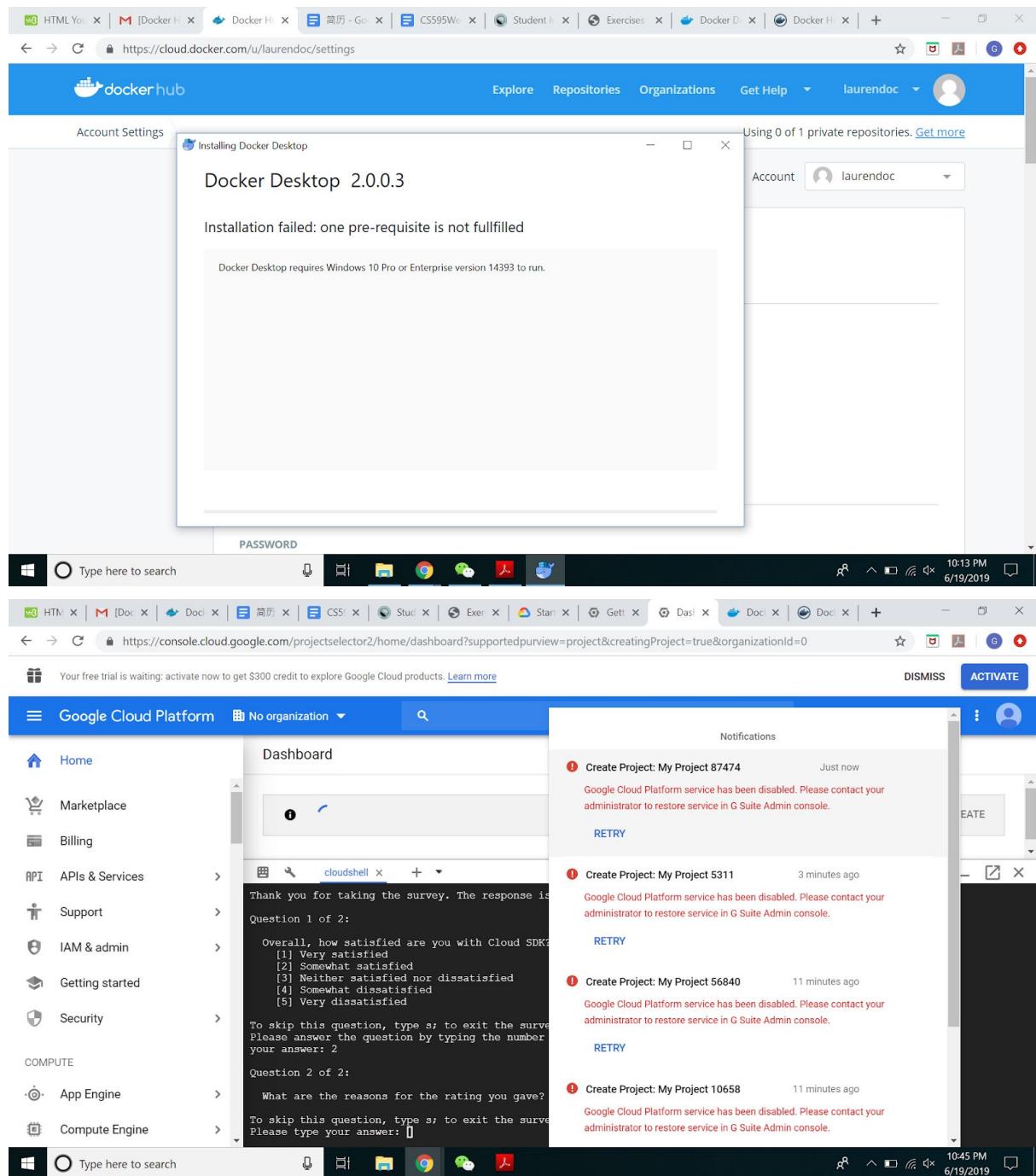


5. Install [Docker](#). Docker builds container images locally.

6. Install [kubectl](#).

7. `gcloud components install kubectl`

Something goes wrong here for the project created and docker installation:
[mail.npu.edu 831774947012 / My Project 87474](#)

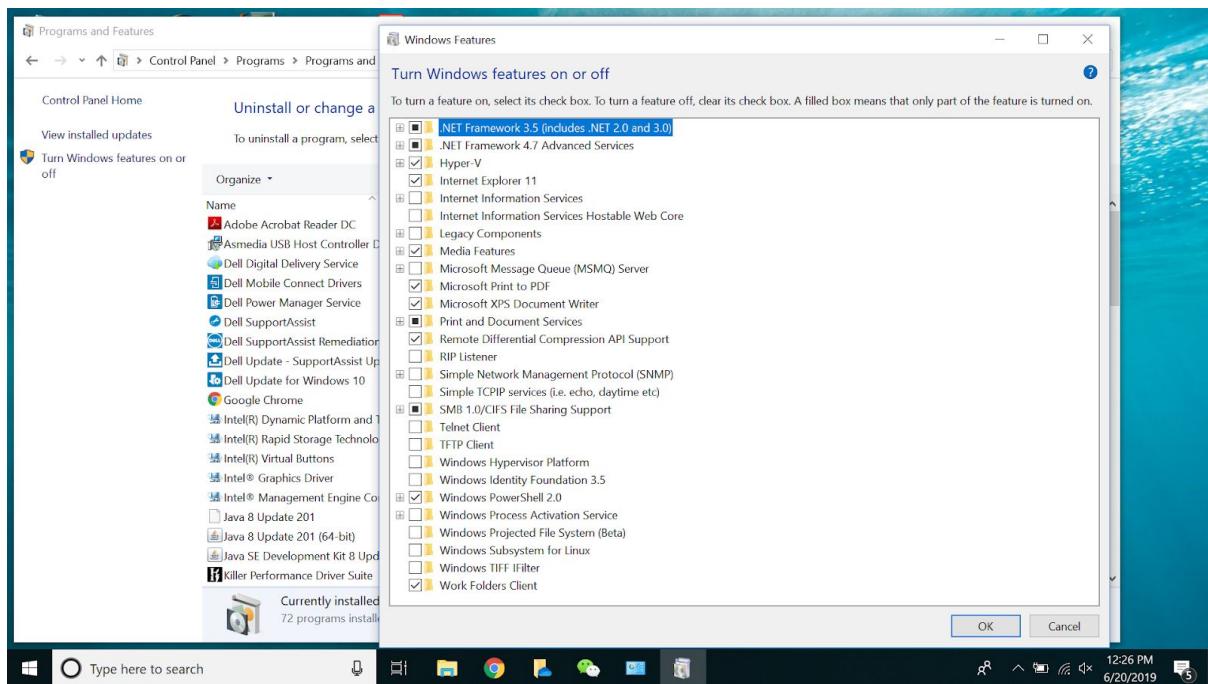


The screenshot shows the Google Cloud Platform interface. The top navigation bar includes links for HTM, Doc, Docker, CSS, Studio, Exercise, Getting Started, Cluster, and more. A banner at the top encourages activating a free trial. The main header says "Google Cloud Platform" and "mail.npu.edu". The left sidebar under "Kubernetes Engine" has sections for Clusters, Workloads, Services, Applications, Configuration, and Marketplace. A "Clusters" section is currently selected. The main content area is titled "Clusters" and shows a "CREATE" button. Below this is a "cloudshell" terminal window. The terminal displays a survey question: "Question 2 of 2: What are the reasons for the rating you gave? [Please DO NOT enter personal info] To skip this question, type s; to exit the survey, type x. Please type your answer: []". The system status bar at the bottom right shows the time as 10:47 PM and the date as 6/19/2019.

The screenshot shows the Google Cloud Platform interface with the "Cloud Shell" tab selected. The top navigation bar and banner are identical to the previous screenshot. The main header says "Cloud Shell". The left sidebar shows "Cloud Shell Environment" (ALPHA). The main content area is a terminal window titled "cloudshell". It displays a series of commands run in a Docker container:

```
s gcloud config unset project
rem10531@cloudshell:~$ gcloud config set compute/zone us-east1-b
Updated property [compute/zone].
rem10531@cloudshell:~$ gcloud components install kubectl
All components are up to date.
rem10531@cloudshell:~$ gcloud config list
[component_manager]
disable_update_check = True
[compute]
gce_metadata_read_timeout_sec = 5
zone = us-east1-b
[core]
account = rem10531@mail.npu.edu
disable_usage_reporting = False
project =
[metrics]
environment = devshell
Your active configuration is: [cloudshell-32698]
rem10531@cloudshell:~$
```

The system status bar at the bottom right shows the time as 10:58 PM and the date as 6/19/2019.



```
c:\ Administrator: Command Prompt
operable program or batch file.

C:\Windows\system32>
C:\Windows\system32>REG ADD "HKEY_LOCAL_MACHINE\software\Microsoft\Windows NT\CurrentVersion" /v EditionId /T REG_EXPAND_SZ /d
ERROR: Invalid syntax.
Type "REG ADD /?" for usage.

C:\Windows\system32>Professional /F
'Professional' is not recognized as an internal or external command,
operable program or batch file.

C:\Windows\system32>REF ADD
'REF' is not recognized as an internal or external command,
operable program or batch file.

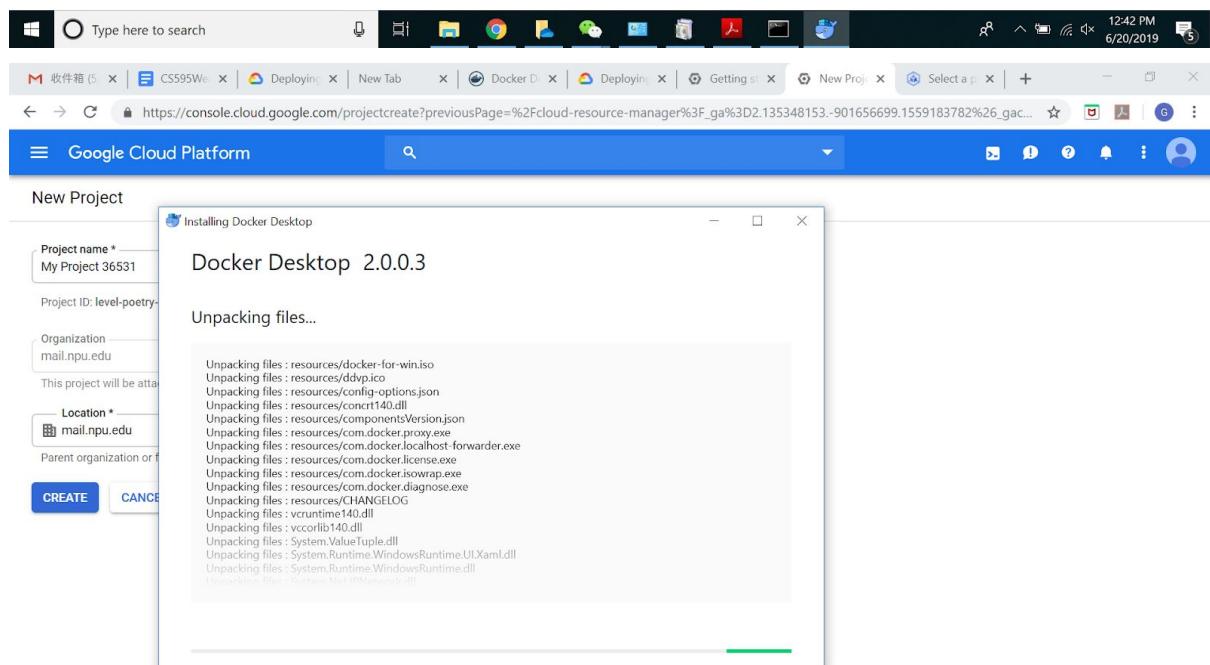
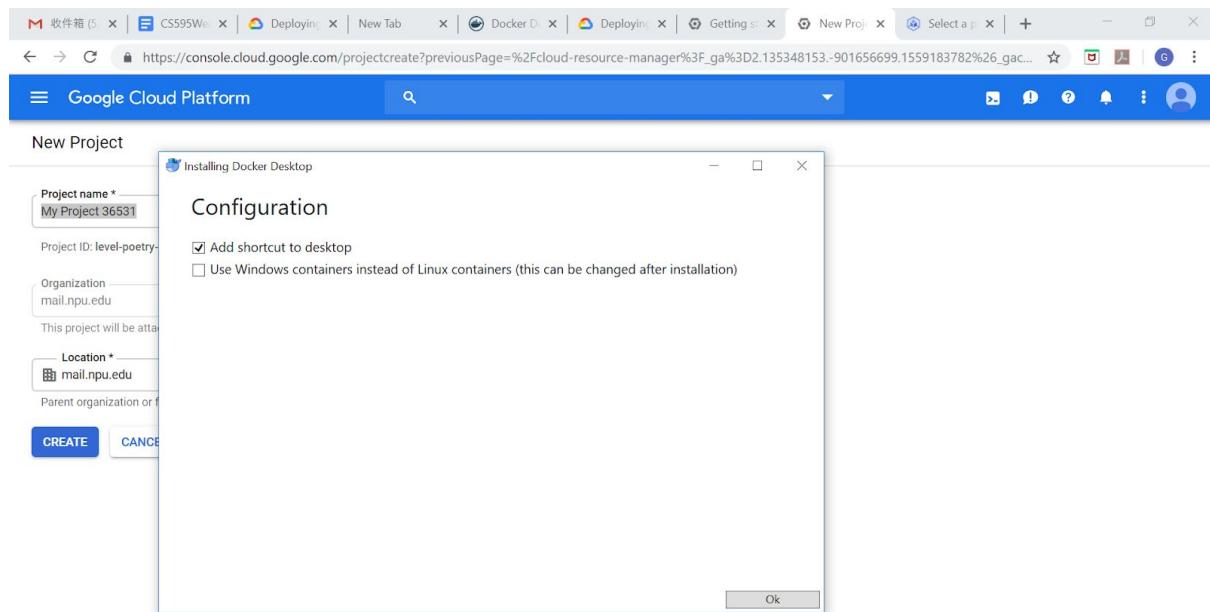
C:\Windows\system32>REG ADD
ERROR: Invalid syntax.
Type "REG ADD /?" for usage.

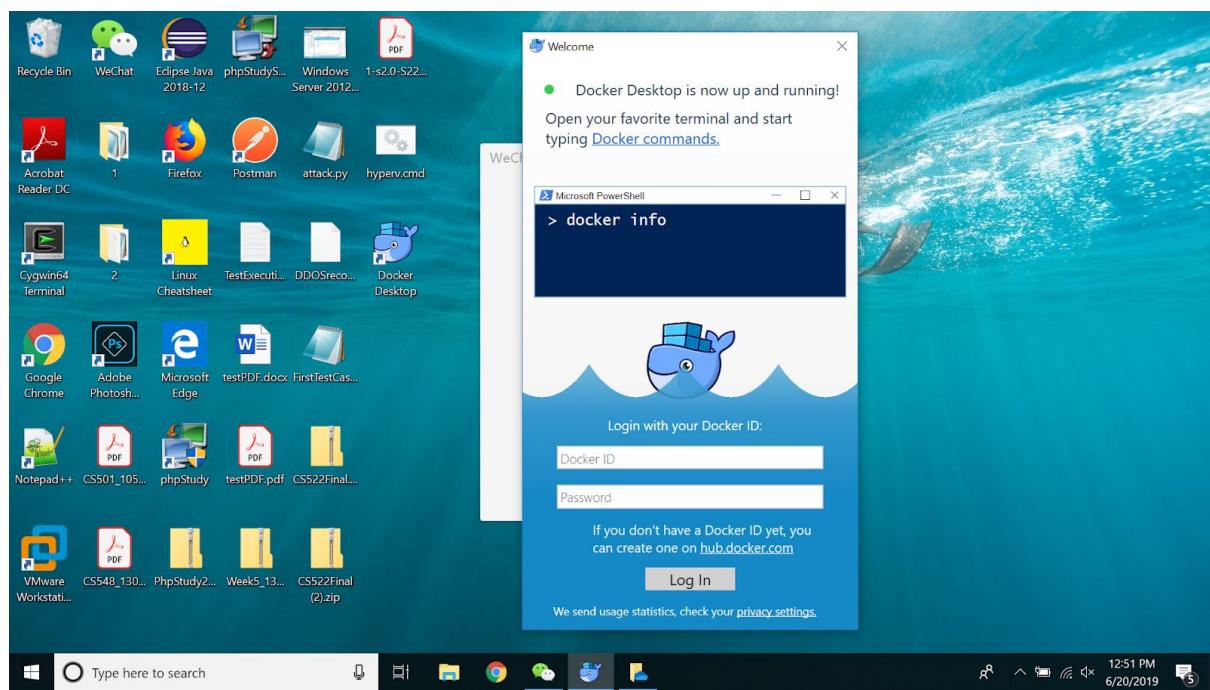
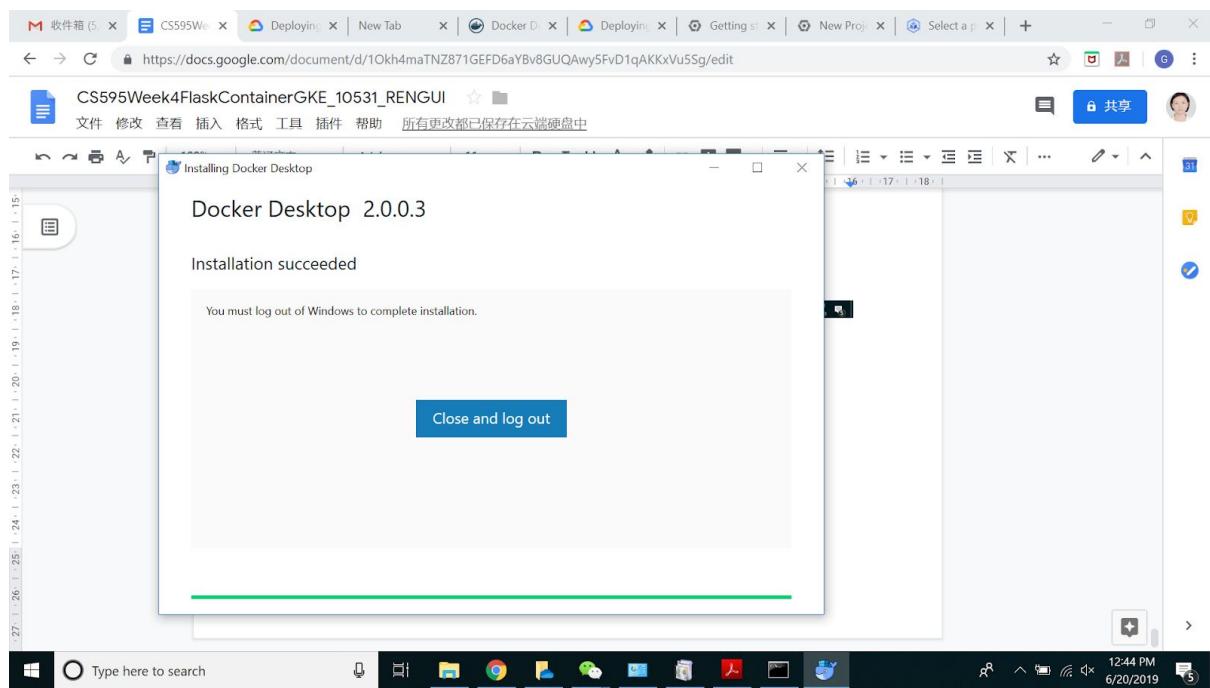
C:\Windows\system32>REG ADD "HKEY_LOCAL_MACHINE\software\Microsoft\Windows NT\CurrentVersion" /v EditionId /T REG_EXPAND_SZ /d
ERROR: Invalid syntax.
Type "REG ADD /?" for usage.

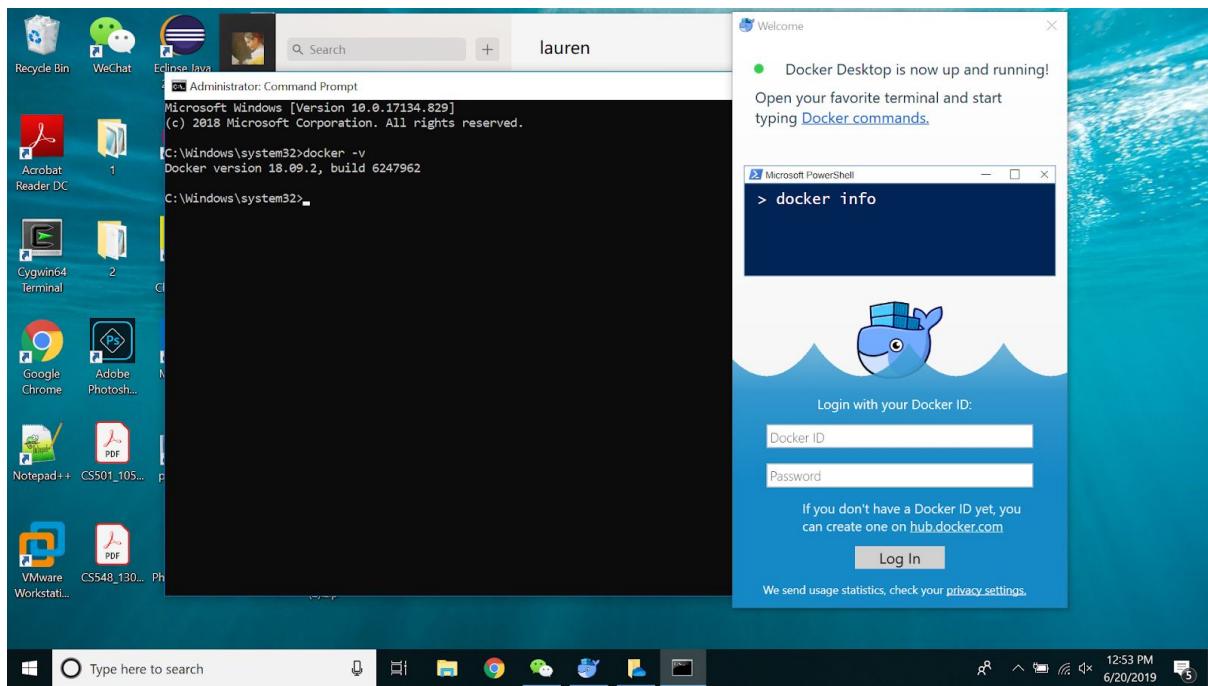
C:\Windows\system32>Professional /F
'Professional' is not recognized as an internal or external command,
operable program or batch file.

C:\Windows\system32>REG ADD "HKEY_LOCAL_MACHINE\software\Microsoft\Windows NT\CurrentVersion" /v EditionId /T REG_EXPAND_SZ /d Professional /F
The operation completed successfully.

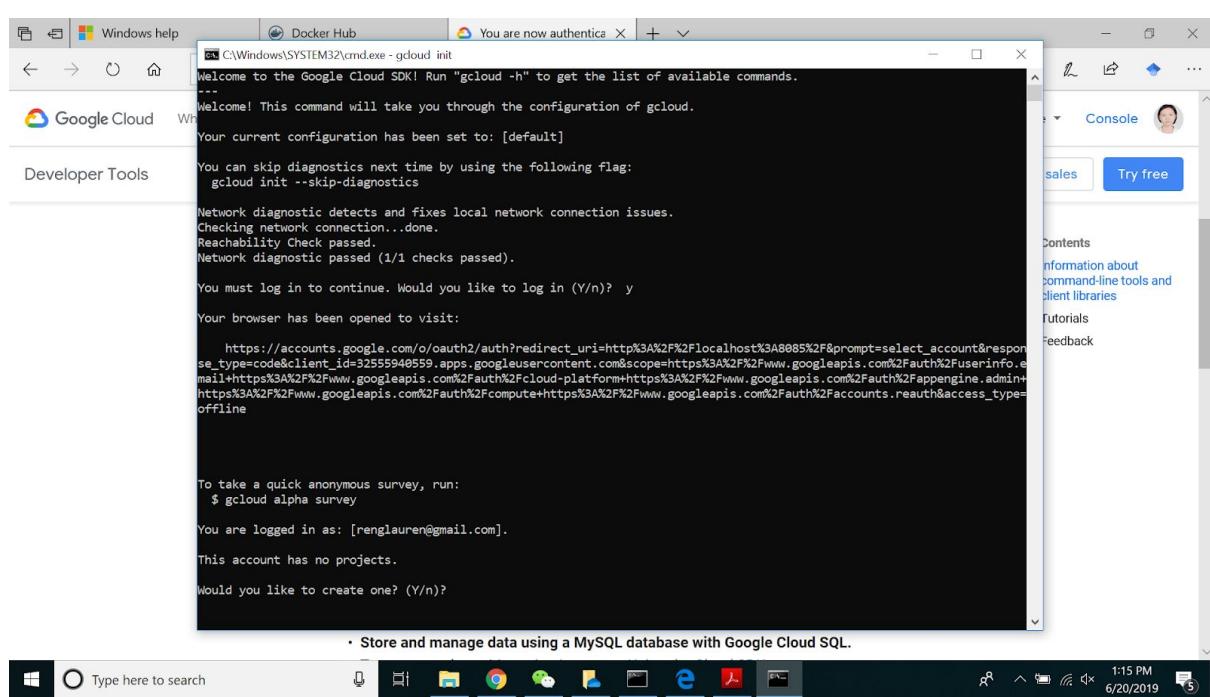
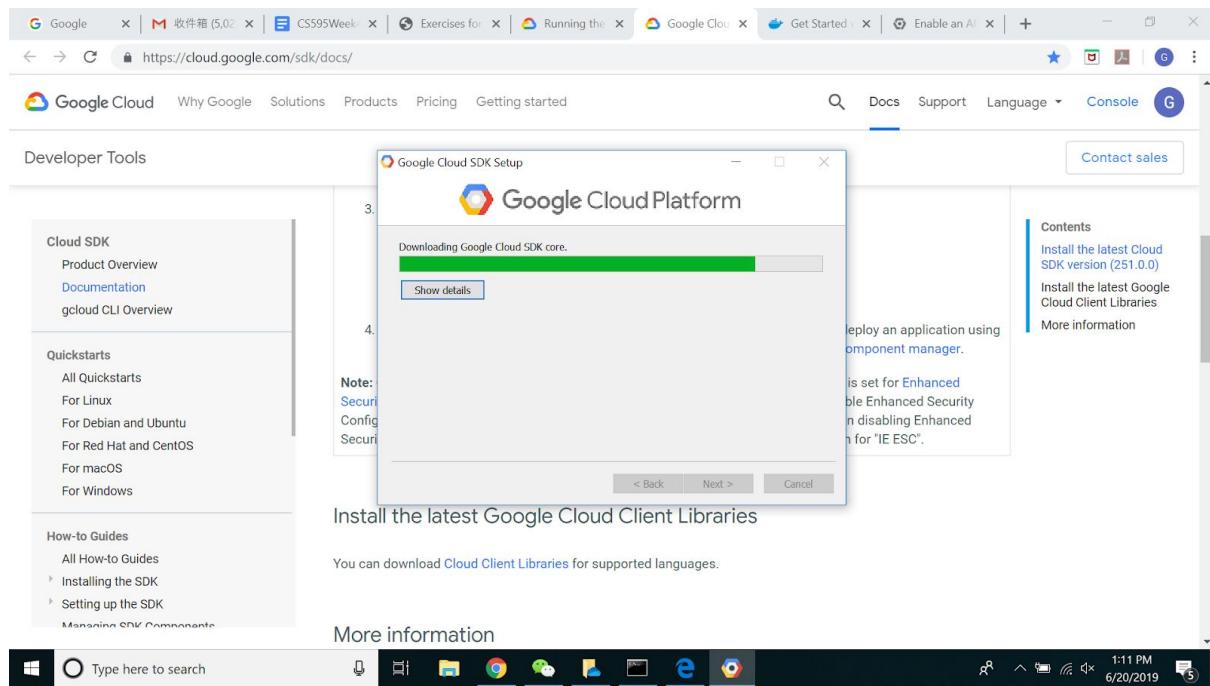
C:\Windows\system32>
```







A screenshot of a web browser window displaying the Google Cloud SDK documentation at https://cloud.google.com/sdk/docs/. The page title is 'Install the latest Cloud SDK version (251.0.0)'. On the left, there's a sidebar with links for 'Cloud SDK', 'Quickstarts', and 'How-to Guides'. The main content area has tabs for 'LINUX', 'DEBIAN/UBUNTU', 'RED HAT/CENTOS', 'MACOS', and 'WINDOWS', with 'WINDOWS' currently selected. It contains step-by-step instructions for installing the Cloud SDK on Windows, including a note about Python dependencies and a warning about experimental support for Python 3.4+. Below the instructions, there's a link to 'After installation has completed, accept the following options:'. On the right side, there's a 'Contents' sidebar with links to other sections like 'Install the latest Google Cloud Client Libraries' and 'More information'. The browser interface includes a top navigation bar with multiple tabs and a bottom taskbar with pinned icons for Google Cloud, Google Sheets, Google Slides, Google Docs, Google Photos, and Google Drive.



```

Google Cloud Platform - https://cloud.google.com
C:\Windows\SYSTEM32\cmd.exe

To take a quick anonymous survey, run:
$ gcloud alpha survey

You are logged in as: [renglauren@gmail.com].
This account has no projects.

Would you like to create one? (Y/n)? y

Enter a Project ID. Note that a Project ID CANNOT be changed later.
Project IDs must be 6-30 characters (lowercase ASCII, digits, or
hyphens) in length and start with a lowercase letter. test123
WARNING: Project creation failed: HttpError accessing <https://clouddriveloadbalancer.googleapis.com/v1/projects?alt=json>
: response: <{'status': '409', 'content-length': '119', 'x-xss-protection': '0', 'x-content-type-options': 'nosniff', 'transfer-encoding': 'chunked', 'vary': 'Origin, X-Origin, Referer', 'server': 'ESF', 'server-timing': 'gfe4t47; dur=625', '-content-encoding': 'gzip', 'cache-control': 'private', 'date': 'Thu, 20 Jun 2019 20:17:01 GMT', 'x-frame-options': 'SAMEORIGIN', 'alt-svc': 'quic=:443; ma=2592000; v='46,44,43,39'", 'content-type': 'application/json; charset=UTF-8'}>,
content <{
    "error": {
        "code": 409,
        "message": "Requested entity already exists",
        "status": "ALREADY_EXISTS"
    }
}
Please make sure to create the project [test123] using
$ gcloud projects create test123
or change to another project using
$ gcloud config set project <PROJECT ID>

Authenticating users via OAuth2
Analyzing big data with Dataflow
Using Machine Learning
Official tutorials and solutions
--enable-basic-auth \

```

```

C:\Windows\SYSTEM32\cmd.exe
To take a quick anonymous survey, run:
$ gcloud alpha survey

You are logged in as: [renglauren@gmail.com].
This account has no projects.

Would you like to create one? (Y/n)? y

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WARNING: Project creation failed: HttpError accessing <https://clouddriveloadbalancer.googleapis.com/v1/projects?alt=json>
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content <{
    "error": {
        "code": 409,
        "message": "Requested entity already exists",
        "status": "ALREADY_EXISTS"
    }
}
Please make sure to create the project [test123] using
$ gcloud projects create test123
or change to another project using
$ gcloud config set project <PROJECT ID>

C:\Users\rengl\AppData\Local\Google\Cloud SDK>gcloud components install kubectl

Restarting command:
$ gcloud components install kubectl

C:\Users\rengl\AppData\Local\Google\Cloud SDK>

cmd.exe /c ""c:\users\rengl\appdata\local\temp\lmpoayiso\python\python.exe...
Your current Cloud SDK version is: 251.0.0
Installing components from version: 251.0.0

These components will be installed.

Name Version Size
kubectl 1.12.8 64.9 MiB
kubectl 2019.06.14 < 1 MiB

For the latest full release notes, please visit:
https://cloud.google.com/sdk/release_notes

Do you want to continue (Y/n)?
```

```

C:\Windows\SYSTEM32\cmd.exe
To take a quick anonymous survey, run:
$ gcloud alpha survey

You are logged in as: [renglauren@gmail.com].
This account has no projects.

Would you like to create one? (Y/n)? y

Enter a Project ID. Note that a Project ID CANNOT be changed later.
Project IDs must be 6-30 characters (lowercase ASCII, digits, or
hyphens) in length and start with a lowercase letter: test123
WARNING: Project creation failed: HttpError accessing <https://cloudresourcemanager.googleapis.com/v1/projects/test123:create>
: response: <['status': '409', 'content-length': '119', '<x-xss-protection>': '0', '<x-content-type-options>': 'nosniff', 'vary': 'Origin, X-Origin, Referer', 'server': 'ESF', 'set-cookie': '<_content-encoding>: gzip', '<cache-control>': 'private', 'date': 'Thu, 28 Jun 2019 20:11:44 GMT', 'location': '<https://cloudresourcemanager.googleapis.com/v1/projects/test123:create>', 'status': '409', 'content-type': 'application/json; charset=UTF-8', 'content': <{>}>, 'error': <{>}>, 'code': 409, 'message': 'Requested entity already exists', 'status': 'ALREADY_EXISTS'>
}

Please make sure to create the project [test123] using
$ gcloud projects create test123
or change to another project using
$ gcloud config set project <PROJECT ID>

C:\Users\rengl\AppData\Local\Google\Cloud SDK>gcloud components install kubectl

Restarting command:
$ gcloud components install kubectl

C:\Users\rengl\AppData\Local\Google\Cloud SDK>

```

cmd.exe /c "cmd /c & cd %~dp0& python <%~nxz>"

These components will be installed.

Name	Version	Size
kubectl	1.12.8	64.9 MiB
kubectl	2019.06.14	< 1 MiB

For the latest full release notes, please visit:
https://cloud.google.com/sdk/release_notes

Do you want to continue (Y/n)? y

= Creating update staging area
= Installing: kubectl
= Installing: kubectl
= Creating backup and activating new installation

Performing post processing steps...done.

Update done!

WARNING: There are older versions of Google Cloud Platform tools on your system PATH.
Please remove the following to avoid accidentally invoking these old tools:
C:\Program Files\Docker\Docker\Resources\bin\kubectl.exe

Press any key to continue . . .

```

C:\Windows\SYSTEM32\cmd.exe
operable program or batch file.

C:\Users\rengl\AppData\Local\Google\Cloud SDK>pip install --upgrade google-cloud-storage
Collecting google-cloud-storage
  Downloading https://files.pythonhosted.org/packages/e2/4e/aee59b19321eb1063317c2e6fa4cf3fcfe21740586de78578eedbd2bed30/google_cloud_storage-1.16.1-py2.py3-none-any.whl (65kB)
    100% |████████████████████████████████| 71kB 874kB/s
Collecting google-resumable-media==0.3.1 (from google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/e2/5d/4bc5c28c252a62efea69ed1a1561da92bd5af8eca0cdcf8e6035fae9b29/google_resumable_media-0.3.2-py2.py3-none-any.whl
Collecting google-cloud-core<2.0dev,>=1.0.0 (from google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/98/7f/f56aec313787577e262d5a2e306c04aef61c5c274699ff9fb40095e6691/google_cloud_core-1.0.2-py2.py3-none-any.whl
Collecting google-auth<1.2.0 (from google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/c5/9b/ed0516cc1f7609fb0217e3057ff4f0f9f3e3ce79a369c6af4a6c5ca25664/google_auth-1.6.3-py2.py3-none-any.whl (73kB)
    100% |████████████████████████████████| 81kB 3.9MB/s
Collecting six (from google-resumable-media==0.3.1->google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/73/fb/00a976f728dd1fecfe898238ce23f502a721c0ac0ecfedb80e0d88c64e9/six-1.12.0-py2.py3-none-any.whl
Collecting google-api-core<2.0dev,>=1.11.0 (from google-cloud-core<2.0dev,>=1.0.0->google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/f7/0b/8caddebdcb93e175075eddff852ab91504e6dc6a3ba0e21ebde8e3c3/google_api_core-1.12.0-py2.py3-none-any.whl (67kB)
    100% |████████████████████████████████| 81kB 6.0MB/s
Collecting pyasn1-modules>=0.2.1 (from google-auth<1.2.0->google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/91/f0/b63e000ce9fdff482742df1c3ce10c74eadefbf706231e8d6d1c356a4062/pyasn1_modules-0.2.5-py2.py3-none-any.whl (74kB)
    100% |████████████████████████████████| 81kB 4.1MB/s
Collecting rsa>=3.1.4 (from google-auth<1.2.0->google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/02/e5/38518af393f7c214357079ce67a317307936896e961e35450b70fad2a9cf/rsa-4.0-py2.py3-none-any.whl
Collecting cachetools>=2.0.0 (from google-auth<1.2.0->google-cloud-storage)
  Downloading https://files.pythonhosted.org/packages/2f/a6/30bb0a0beff2283e83e58c1d6e7b5aab7acf4110df81a4471655d33e794/cachetools-3.1.1-py2.py3-none-any.whl
Requirement already satisfied, skipping upgrade: setuptools>=40.0.0 in c:/users/rengl/appdata/local/programs/python/python37-32/lib/site-packages (from google-api-core<2.0dev,>=1.11.0->google-cloud-core<2.0dev,>=1.0.0->google-cloud-storage) (40.8.0)
Collecting protobuf>=3.4.0 (from google-api-core<2.0dev,>=1.11.0->google-cloud-core<2.0dev,>=1.0.0->google-cloud-storage)

```

Was this page helpful? Let us know how we did.

C:\Windows\SYSTEM32\cmd.exe
Your current Cloud SDK version is: 251.0.0
The latest available version is: 251.0.0

Components			
Status	Name	ID	Size
Not Installed	App Engine Go Extensions	app-engine-go	56.9 MiB
Not Installed	Cloud Bigtable Command Line Tool	cbt	6.2 MiB
Not Installed	Cloud Bigtable Emulator	bigtable	6.4 MiB
Not Installed	Cloud DataLab Command Line Tool	datalab	< 1 MiB
Not Installed	Cloud Datastore Emulator	cloud-datastore-emulator	18.4 MiB
Not Installed	Cloud Datastore Emulator (Legacy)	gcd-emulator	38.1 MiB
Not Installed	Cloud Firestore Emulator	cloud-firebase-emulator	40.8 MiB
Not Installed	Cloud Pub/Sub Emulator	pubsub-emulator	34.8 MiB
Not Installed	Cloud SQL Proxy	cloud_sql_proxy	3.5 MiB
Not Installed	Emulator Reverse Proxy	emulator-reverse-proxy	14.5 MiB
Not Installed	Google Container Registry's Docker credential helper	docker-credential-gcr	1.8 MiB
Not Installed	gcloud Alpha Commands	alpha	< 1 MiB
Not Installed	gcloud Beta Commands	beta	< 1 MiB
Not Installed	gcloud app Java Extensions	app-engine-java	103.3 MiB
Not Installed	gcloud app PHP Extensions	app-engine-php	19.1 MiB
Not Installed	gcloud app Python Extensions	app-engine-python	6.0 MiB
Not Installed	gcloud app Python Extensions (Extra Libraries)	app-engine-python-extras	28.5 MiB
Installed	BIGQuery Command Line Tool	bq	< 1 MiB
Installed	Cloud SDK Core Libraries	core	10.8 MiB
Installed	Cloud Storage Command Line Tool	gsutil	3.8 MiB
Installed	kubectl	kubectl	< 1 MiB

To install or remove components at your current SDK version [251.0.0], run:
\$ gcloud components install COMPONENT_ID
\$ gcloud components remove COMPONENT_ID

To update your SDK installation to the latest version [251.0.0], run:
\$ gcloud components update

C:\Users\rengl\AppData\Local\Google\Cloud SDK>

Release Notes | Installed | Cloud Datastore Emulator

Type here to search

C:\Windows\SYSTEM32\cmd.exe
Not Installed App Engine Go Extensions app-engine-go 56.9 MiB
Not Installed Cloud Bigtable Command Line Tool cbt 6.2 MiB
Not Installed Cloud Bigtable Emulator bigtable 6.4 MiB
Not Installed Cloud DataLab Command Line Tool datalab < 1 MiB
Not Installed Cloud Datastore Emulator cloud-datastore-emulator 18.4 MiB
Not Installed Cloud Datastore Emulator (Legacy) gcd-emulator 38.1 MiB
Not Installed Cloud Firestore Emulator cloud-firebase-emulator 40.8 MiB
Not Installed Cloud Pub/Sub Emulator pubsub-emulator 34.8 MiB
Not Installed Cloud SQL Proxy cloud_sql_proxy 3.5 MiB
Not Installed Emulator Reverse Proxy emulator-reverse-proxy 14.5 MiB
Not Installed Google Container Registry's Docker credential helper docker-credential-gcr 1.8 MiB
Not Installed gcloud Alpha Commands alpha < 1 MiB
Not Installed gcloud Beta Commands beta < 1 MiB
Not Installed gcloud app Java Extensions app-engine-java 103.3 MiB
Not Installed gcloud app PHP Extensions app-engine-php 19.1 MiB
Not Installed gcloud app Python Extensions app-engine-python 6.0 MiB
Not Installed gcloud app Python Extensions (Extra Libraries) app-engine-python-extras 28.5 MiB
Installed BIGQuery Command Line Tool bq < 1 MiB
Installed Cloud SDK Core Libraries core 10.8 MiB
Installed Cloud Storage Command Line Tool gsutil 3.8 MiB
Installed kubectl kubectl < 1 MiB

To install or remove components at your current SDK version [251.0.0], run:
\$ gcloud components install COMPONENT_ID
\$ gcloud components remove COMPONENT_ID

To update your SDK installation to the latest version [251.0.0], run:
\$ gcloud components update

C:\Users\rengl\AppData\Local\Google\Cloud SDK>gcloud components install kubectl

All components are up to date.

C:\Users\rengl\AppData\Local\Google\Cloud SDK>kubectl get nodes
Unable to connect to the server: dial tcp [::1]:8080: connectex: No connection could be made because the target machine actively refused it.

C:\Users\rengl\AppData\Local\Google\Cloud SDK>

Dashboard - Google Cloud Platform | Contact sales

The following command lists the nodes in your container cluster is running and that you

ces in a GKE cluster. To learn more about you use gcloud to manage resources in ge resources in your GKE cluster. A single have clusters made up of different machine

Type here to search