

Kubeflow Setup on Google Cloud Platform:

- We create a docker file

```
Dockerfile U X
E: > extras > Fall 2022 > ML-OPS > kubeflow > salary_pipeline-master > salary_pipeline-master > Dockerfile > ...
1 FROM python:3.8
2
3 COPY requirements.txt .
4
5 RUN pip install -r requirements.txt
```

- We create a docker image using the docker file locally and export it to google cloud.
- We use the base image of python 3.8 along with the requirement file we created.
- The requirement file contains python libraries needed for code execution.

```
Dockerfile U ! cloudbuild.yaml U X requirements.txt U X
E: > extras > Fall 2022 > ML-OPS > kubeflow > code_artifacts > code_rep_gcloud > requirements.txt
1 sklearn
2 matplotlib
3 fastapi
4 uvicorn
5 tfx
6 python-snappy
7 numpy
8 pandas
9 kfp
10 sympy
```

- Yaml file (cloud build) to specify the steps for build order

```
Dockerfile U ! cloudbuild.yaml U X
E: > extras > Fall 2022 > ML-OPS > kubeflow > code_artifacts > code_rep_gcloud > cloudbuild.yaml
1 steps:
2 - name: 'gcr.io/cloud-builders/docker'
3   args: ['build', '-t', 'gcr.io/singular-willow-339022/mlimage', '.']
4 - name: 'gcr.io/cloud-builders/docker'
5   args: ['push', 'gcr.io/singular-willow-339022/mlimage' ]
```

- Using cmd prompt, we run commands to build the docker image on google cloud using the yaml config file.
- To run the google cloud commands on cmd, we first need to instal the google cloud SDK.
- Google cloud SDK can be installed on local windows machine by running power shell commands provided on <https://cloud.google.com/sdk/docs/install>

Installation instructions

These instructions are for installing the Google Cloud CLI. For information about installing additional components, such as gcloud CLI commands at the alpha or beta release level, see [Managing gcloud CLI components](#).

★ **Note:** If you are behind a proxy/firewall, see the [proxy settings](#) page for more information on installation.

Linux

Debian/Ubuntu

Red Hat/Fedora/CentOS

macOS

Windows

The Google Cloud CLI works on Windows 8.1 and later and Windows Server 2012 and later.

1. Download the [Google Cloud CLI installer](#).

Alternatively, open a PowerShell terminal and run the following PowerShell commands:

```
(New-Object Net.WebClient).DownloadFile("https://dl.google.com/dl/cloudsdk/channels/rapid/GoogleCloudSDKInstaller.exe",  
& $env:Temp\GoogleCloudSDKInstaller.exe
```

Power Shell Command:

```
(New-Object Net.WebClient).DownloadFile  
("https://dl.google.com/dl/cloudsdk/channels  
/rapid/GoogleCloudSDKInstaller.exe",  
"$env:Temp\GoogleCloudSDKInstaller.exe")  
  
& $env:Temp\GoogleCloudSDKInstaller.exe
```

```
(New-Object  
Net.WebClient).DownloadFile("https://dl.google.com/dl/cloudsdk/channels/rapid/GoogleCloudSDKInstaller.ex  
e", "$env:Temp\GoogleCloudSDKInstaller.exe")  
  
& $env:Temp\GoogleCloudSDKInstaller.exe
```



- Proceed by clicking on next till the end. On the finish page, select the 'run gcloud.init to configure the Cloud SDK' option and click on finish.
- Once the google cloud SDK is installed, the google cloud command line can be opened by running the 'gcloud init' command on command prompt.
- During the first login, we are asked to sign into our GCP account. Once the initial sign in is done, restart the terminal.

```
C:\Users\TV>gcloud init
Welcome! This command will take you through the configuration of gcloud.

Settings from your current configuration [default] are:
accessibility:
  screen_reader: 'False'
compute:
  region: us-central1
  zone: us-central1-c
core:
  account: tadurt2@uic.edu
  disable_usage_reporting: 'True'
  project: my-first-project-363922

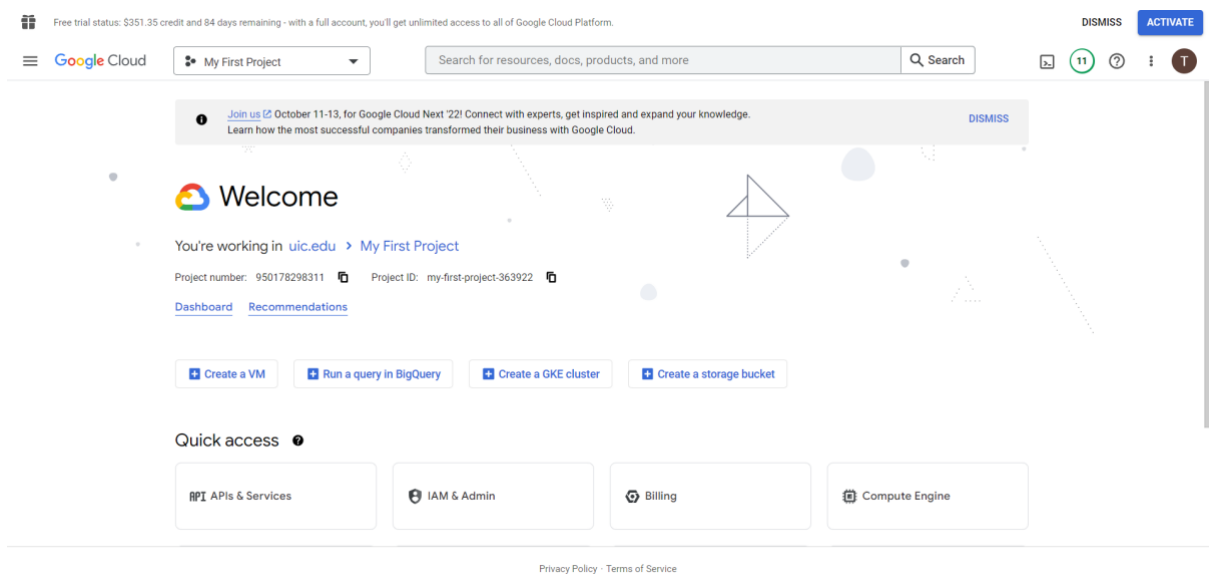
Pick configuration to use:
[1] Re-initialize this configuration [default] with new settings
[2] Create a new configuration
Please enter your numeric choice:
```

- On restarting the terminal, we can verify the gcp account linked and the gcp project we signed in to.
- On powershell, run the following command:
- gcloud builds submit --config configbuild.yaml . --timeout=10000

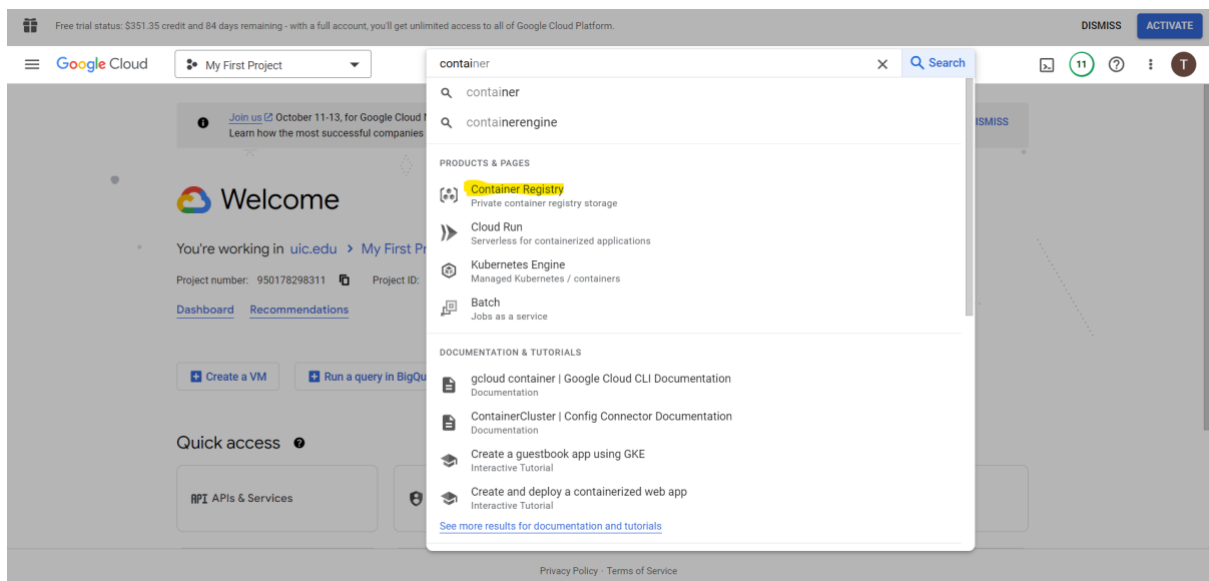
```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER

PS C:\Users\TV> gcloud builds submit --config configbuild.yaml . --timeout=10000
```

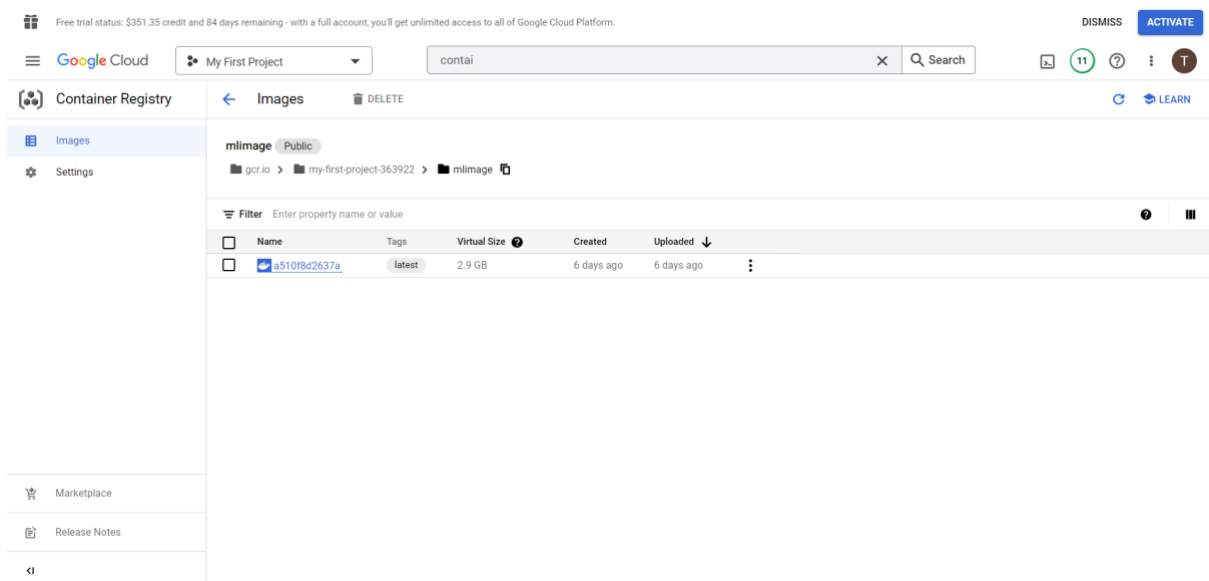
- This command builds our docker file into an image, exports it to our GCP project and runs the container.
- Go to GCP



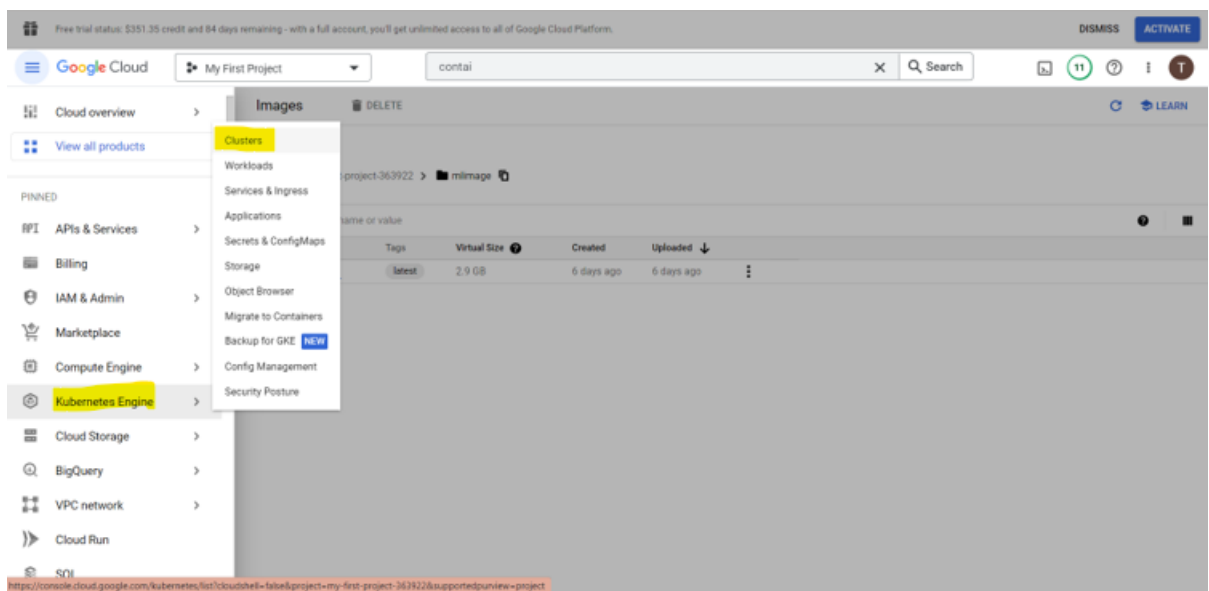
- Open container registry



- Container of the image built locally and exported can be verified.



- Select the Kubernetes product, then select the clusters option



- On this page, the Kubernetes cluster can be created.

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Filter Enter property name or value

Status	Name	Location	Number of nodes	Total vCPUs	Total memory	Notifications	Labels
<input checked="" type="checkbox"/>	cluster-1	us-central1-c	3	6	22.5 GB		

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Choose the types of GKE clusters based on your desired level of control, availability type, mode of operation etc.

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Containerize a sample app using Cloud Build and deploy in GKE, using language-specific code samples.

[GKE use cases](#)
Explore use cases, best practices, and industry solutions.

[Create a zonal cluster](#)
Create a standard zonal cluster with default features enabled in GKE.

[Cluster architecture](#)
Understand the GKE cluster architecture, including cluster masters, nodes, and node-allocatable resources.

[Add and manage node pools](#)
Add and manage the node pools that are running in your GKE clusters.

[Cluster autoscaler](#)
Automatically resize your cluster's node

- Go to AI Platform and select pipelines

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[Add and manage node pools](#)
Add and manage the node pools that are running in your AI Platform clusters.

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Automatically resize your cluster's node

- We create new Kubeflow pipelines through this UI

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Cluster

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kubeflow-pipelines-1

OPEN PIPELINES DASHBOARD

us-central1-c

1.8.5

[cluster-1](#)

default

SETTINGS

Click on “Open Pipeline Dashboard”

Getting Started

Build your own pipeline with

Kubeflow Pipelines SDK

Try out the new Kubeflow Pipelines SDK v2 (Beta)

TensorFlow Extended (TFX) SDK with end-to-end ML Pipeline Template (Open a Vertex AI Workbench on Google Cloud)

Demonstrations and Tutorials

This section contains demo and tutorial pipelines.

Demos - Try an end-to-end demonstration pipeline.

TFX pipeline demo with Estimator

Classification pipeline with model analysis, based on a public BigQuery dataset of taxicab trips. [source code](#)

XGBoost Pipeline demo

An example of end-to-end iterative XGBoost model training. [source code](#)

Tutorials - Learn pipeline concepts by following a tutorial.

Data passing in Python components

Shows how to pass data between Python components. [source code](#)

DSL - Control structures

Shows how to use conditional execution and exit handlers. [source code](#)

Want to learn more? [Learn from sample and tutorial pipelines.](#)

Cluster name: cluster-1

Version: 1.8.5

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