

Assignment 1, Cloud Application Development

Put all deliverables into github repository in your profile. Share link to google form 24 hours before defense. Defend by explaining deliverables and answering questions.

Deliverables: report in pdf

Google form:

https://docs.google.com/forms/d/e/1FAIpQLSe0GyNdOYlvM1tX_I_CtlPod5jBf-ACLGdHYZq1gVZbUeBzlg/viewform?usp=sf_link

Exercise 1: Setting Up Google Cloud SDK

1. **Objective:** Install and configure the Google Cloud SDK on your local machine.
2. **Steps:**
 - Visit the Google Cloud SDK installation page.
 - Follow the instructions to download and install the SDK for your operating system.
 - After installation, run `gcloud init` to initialize the SDK and authenticate with your Google account.
 - Configure the default project and region.
 - Verify the installation by running `gcloud version` and `gcloud info`.

```
C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud version
Google Cloud SDK 491.0.0
bq 2.1.8
core 2024.08.30
gcloud-crc32c 1.0.0
gsutil 5.30
Updates are available for some Google Cloud CLI components. To install them,
please run:
  $ gcloud components update

C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud info
Google Cloud SDK [491.0.0]

Platform: [Windows, x86_64] uname_result(system='Windows', node='LAPTOP-7UEIS905', release='10', version='10.0.22631', machine='AMD64')
Locale: ('Russian_Kazakhstan', '1252')
Python Version: [3.11.9 (tags/v3.11.9:de54cf5, Apr 2 2024, 10:12:12) [MSC v.1938 64 bit (AMD64)]]
Python Location: [C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\platform\bundledpython\python.exe]
OpenSSL: [OpenSSL 3.0.13 30 Jan 2024]
Requests Version: [2.25.1]
urllib3 Version: [1.26.9]
Default CA certs file: [C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\bin\..\lib\third_party\certifi\cacert.pem]
Site Packages: [Disabled]

Installation Root: [C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk]
Installed Components:
  bq: [2.1.8]
  core: [2024.08.30]
  gcloud-crc32c: [1.0.0]
  gsutil: [5.30]
System PATH: [C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\bin\..\bin;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\bin;C:\Python312\Scripts\;C:\Python312\;C:\Program Files\Common Files\Oracle\Java\javapath;C:\Windows\System32\HWAudioDriver;C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0\;C:\Windows\System32\OpenSSH;C:\Users\Administrator\AppData\Local\Microsoft\WindowsApps;D:\node\;C:\ProgramData\chocolatey\bin;D:\Git\cmd;C:\Users\Seka\AppData\Local\Microsoft\WindowsApps;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\bin;]
Python PATH: [C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\bin\..\lib\third_party;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\bin\..\lib;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\lib;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\platform\bundledpython\python311.zip;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\platform\bundledpython\DLLs;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\platform\bundledpython\Lib;C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\platform\bundledpython]
Cloud SDK on PATH: [True]
Kubectl on PATH: [False]

Installation Properties: [C:\Users\Seka\AppData\Local\Google\Cloud SDK\google-cloud-sdk\properties]
User Config Directory: [C:\Users\Seka\AppData\Roaming\gcloud]
Active Configuration Name: [my-default]
Active Configuration Path: [C:\Users\Seka\AppData\Roaming\gcloud\configurations\config_my-default]
```

```
Account: [alishror171@gmail.com]
Project: [cloud-alishersk-dev-1]
Universe Domain: [googleapis.com]

Current Properties:
[accessibility]
  screen_reader: [False] (property file)
[compute]
  region: [REGION] (property file)
[core]
  account: [alishror171@gmail.com] (property file)
  disable_usage_reporting: [True] (property file)
  project: [cloud-alishersk-dev-1] (property file)

Logs Directory: [C:\Users\Seka\AppData\Roaming\gcloud\logs]
Last Log File: [C:\Users\Seka\AppData\Roaming\gcloud\logs\2024.09.15\15.57.31.177126.log]

git: [git version 2.45.1.windows.1]
]sh: [OpenSSH_for_Windows_8.6p1, LibreSSL 3.4.3]
```

3. Questions:

- What command did you use to authenticate with your Google account?

`gcloud auth login`

- How did you set the default project?

You are prompt to create a project or use existing one after `gcloud init` command

But because my project name was wrong I needed to do it manually using commands:

`gcloud projects create cloud-alishersk-dev-1`

`gcloud config set project cloud-alishersk-dev-1`

- What information does the `gcloud info` command provide?

The `gcloud info` command provides detailed information about Google Cloud SDK environment, such as SDK version, active project, account, default region/zone, and paths for installation and logs. It also displays current configuration settings and environment variables

Exercise 2: Exploring Cloud Shell

1. **Objective:** Familiarize yourself with the Google Cloud Shell environment.
2. **Steps:**
 - Open the Google Cloud Console and activate Cloud Shell.
 - Explore the environment by listing files and checking the available tools.
 - Run the command `gcloud config list` to see your current configuration.

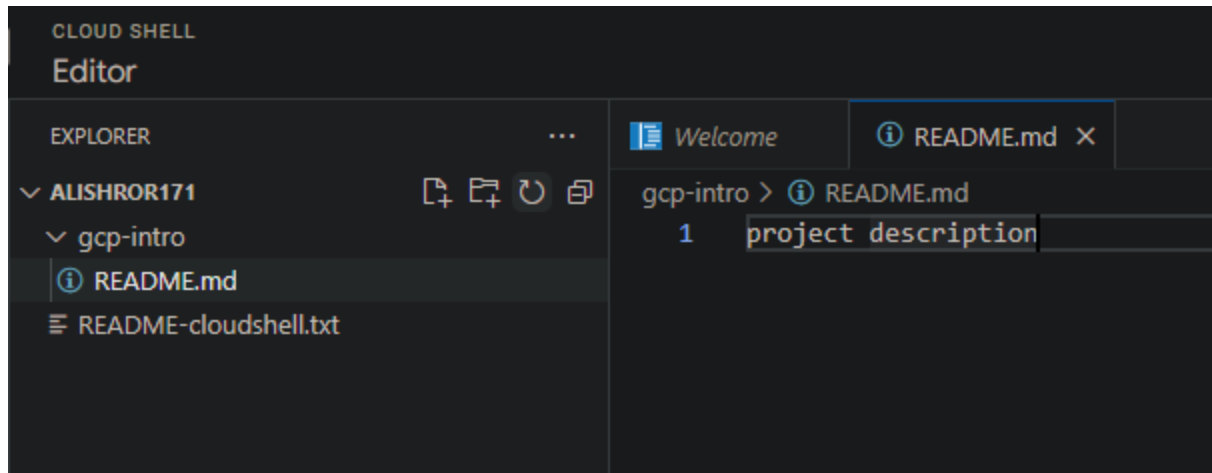
- Create a directory named `gcp-intro` and navigate into it.
- Use the built-in code editor to create a simple `README.md` file describing your GCP project.

```

Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to cloud-alishersk-dev-1.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ ls
README-cloudshell.txt
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ gcloud --version
Google Cloud SDK 489.0.0
alpha 2024.08.16
app-engine-go 1.9.76
app-engine-java 2.0.29
app-engine-python 1.9.113
app-engine-python-extras 1.9.107
beta 2024.08.16
bigtable
bq 2.1.8
bundled-python3-unix 3.11.9
cbt 1.21.0
cloud-datastore-emulator 2.3.1
cloud-run-proxy 0.5.0
core 2024.08.16
gcloud-crc32c 1.0.0
gke-gcloud-auth-plugin 0.5.9
gsutil 5.30
kpt 1.0.0-beta.50
kubect1 1.28.12
local-extract 1.5.10
minikube 1.33.1
nomos 1.18.3-rc.4
package-go-module 0.4.0
pubsub-emulator 0.8.14
skaffold 2.13.1
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ ^C
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ gcloud config list
[accessibility]
screen_reader = True
[component_manager]
disable_update_check = True
[compute]
gce_metadata_read_timeout_sec = 30
[core]
account = alishror171@gmail.com
disable_usage_reporting = False
project = cloud-alishersk-dev-1
[metrics]
environment = devshell

Your active configuration is: [cloudshell-19084]
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ mkdir gcp-intro
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ cd gcp-intro
alishror171@cloudshell:~/gcp-intro (cloud-alishersk-dev-1)$ code .
-bash: code: command not found

```



3. Questions:

- What is the default home directory in Cloud Shell?

```
alishror171@cloudshell:~/gcp-intro (cloud-alishersk-dev-1)$ cd ..
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ cd ..
alishror171@cloudshell:/home (cloud-alishersk-dev-1)$ cd ..
```

The default path is `home/~alishror171@cloudshell`

- What tools are pre-installed in Cloud Shell?

`gcloud`, the Google Cloud SDK for managing GCP resources.

`kubectl`, for managing Kubernetes clusters.

Minkube, different emulators, python, java go etc.

- How can you open the built-in code editor in Cloud Shell?

Launch the Cloud Shell Editor by clicking Code Editor Button Open Editor on the toolbar of the Cloud Shell window. The editor opens above the Cloud Shell terminal window.

You also can also launch the Cloud Shell Editor by navigating to ide.cloud.google.com.

Exercise 3: Managing Projects with Google Cloud SDK

1. **Objective:** Use Google Cloud SDK to manage projects.

2. **Steps:**

- List all the projects associated with your Google account using `gcloud projects list`.

- Create a new project with the command `gcloud projects create PROJECT_ID --name="My First GCP Project"`.
- Set this new project as your default project.
- Explore project metadata using `gcloud projects describe PROJECT_ID`.
- Delete the project using `gcloud projects delete PROJECT_ID` after completing the exercise.

```
C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud projects list
PROJECT_ID      NAME                PROJECT_NUMBER
alishersk-blog  alishersk-blog     283096802084
angular-x-tg    angular-x-tg        914308437776
cloud-alishersk-dev-1  cloud-alishersk-dev-1  1056252107841
effective-tools-2cd22  effective-tools      1032273143690
portfolio-e7608      portfolio            542962241383
pulse-palette-f1982   pulse-palette        858018437585
rachie-396110        rachie               801298475564
youth-center-education  Youth Center Education 332525250565

C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud projects create cloud-alishersk-dev-1.3 --name="My First GCP Project"
ERROR: (gcloud.projects.create) argument PROJECT_ID: Bad value [cloud-alishersk-dev-1.3]: Project IDs are immutable and can be
start with a lowercase letter and can have lowercase ASCII letters, digits or hyphens. Project IDs must be between 6 and 30 c
Usage: gcloud projects create [PROJECT_ID] [optional flags]
optional flags may be  --enable-cloud-apis | --folder | --help | --labels |
                      --name | --organization | --set-as-default | --tags

For detailed information on this command and its flags, run:
  gcloud projects create --help

C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud projects create cloud-alishersk-dev-1-3 --name="My First GCP Project"
Create in progress for [https://cloudresourcemanager.googleapis.com/v1/projects/cloud-alishersk-dev-1-3].
Waiting for [operations/cp.6382729651248019342] to finish...done.
Enabling service [cloudapis.googleapis.com] on project [cloud-alishersk-dev-1-3]...
Operation "operations/acet.p2-803231845719-c6ec4a08-20b4-4e5a-8b29-383a45c1c039" finished successfully.

C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud config set project cloud-alishersk-dev-1-3
Updated property [core/project].

C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud projects describe cloud-alishersk-dev-1-3
createTime: '2024-09-15T12:19:28.717870Z'
lifecycleState: ACTIVE
name: My First GCP Project
projectId: cloud-alishersk-dev-1-3
projectNumber: '803231845719'

C:\Users\Seka\AppData\Local\Google\Cloud SDK>gcloud projects delete cloud-alishersk-dev-1-3
Your project will be deleted.

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

Deleted [https://cloudresourcemanager.googleapis.com/v1/projects/cloud-alishersk-dev-1-3].

You can undo this operation for a limited period by running the command below.
$ gcloud projects undelete cloud-alishersk-dev-1-3

See https://cloud.google.com/resource-manager/docs/creating-managing-projects for information on shutting down projects.
```

3. Questions:

- How do you list all projects associated with your account?

`gcloud projects list`

- What command is used to set a default project?

`gcloud config set project PROJECT_ID`

- How do you describe project metadata?

`gcloud projects describe PROJECT_ID`

Exercise 4: Using Cloud Shell for Basic Operations

1. **Objective:** Perform basic file and directory operations in Cloud Shell.
2. **Steps:**
 - In Cloud Shell, create a directory structure that mimics a small project (e.g., `myproject/src`, `myproject/tests`, `myproject/docs`).
 - Create a few files in these directories and use commands like `touch`, `nano`, `cat`, and `rm` to manipulate them.

```
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ ls
gcp-intro  README-cloudshell.txt
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ mkdir -p myproject/src myproject/tests myproject/docs
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ ls
gcp-intro  myproject  README-cloudshell.txt
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ touch myproject/src/index.html myproject/tests/main-test.js
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ touch myproject/docs/notes.txt
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ nano myproject/src/index.html
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ cat myproject/src/index.html
<html>
<head>
<title>First Cloud App</title>
</head>
<body>
Welcome to my first cloud application!
</body>
</html>
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ rm myproject/docs/notes.txt
```

- Write how to use `gsutil` to create a new Cloud Storage bucket and upload a file from your Cloud Shell environment.

Command:

```
gsutil mb -l REGION gs://BUCKET_NAME/
```

Replace REGION with a region code (e.g., `us-central1`) and BUCKET_NAME with a unique bucket name.

Example:

```
gsutil mb -l us-central1 gs://my-cloud-bucket/
```

Then use the `gsutil cp` command to upload files from your Cloud Shell environment to the newly created bucket.

Command:

```
gsutil cp myproject/docs/README.md gs://YOUR_BUCKET_NAME/
```

Example:

```
gsutil cp myproject/docs/README.md gs://my-cloud-bucket/
```

- Verify the file upload by listing the contents of the bucket.

To verify that the file was successfully uploaded, list the contents of the bucket using the `gsutil ls` command.

Command:

```
gsutil ls gs://YOUR_BUCKET_NAME/
```

Example:

```
gsutil ls gs://my-cloud-bucket/
```

3. Questions:

- What command did you use to create the directory structure?

```
mkdir -p myproject/src myproject/tests myproject/docs
```

- How did you upload a file to a Cloud Storage bucket?

I used the `gsutil cp` command to upload a file:

```
gsutil cp myproject/docs/README.md gs://BUCKET_NAME/
```

- How can you list the contents of a Cloud Storage bucket?

```
gsutil ls gs://BUCKET_NAME/
```

Exercise 5: Automating Tasks with Shell Scripts in Cloud Shell

1. **Objective:** Write and execute a basic shell script in Cloud Shell.

2. **Steps:**

- In Cloud Shell, create a new shell script named `setup.sh` in your `gcp-intro` directory.
- The script should automate the creation of a new directory, a simple text file, and set up a basic Google Cloud configuration (e.g., set a default project).
- Make the script executable using `chmod +x setup.sh`.
- Run the script and verify that it performs the expected tasks.

```

Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to cloud-alishersk-dev-1.
Use "gcloud config set project [PROJECT_ID]" to change to a different project.
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ ls
gcp-intro  myproject  README-cloudshell.txt
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ nano gcp-intro/setup.sh
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ chmod +x gcp-intro/setup.sh
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ cat gcp-intro/setup.sh
#!/bin/bash

mkdir -p my-new-directory

echo "This is a basic GCP project setup." > my-new-directory/project-info.txt

gcloud config set project cloud-alishersk-dev-1

echo "Script completed successfully."
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ gcp-intro/setup.sh
Updated property [core/project].
Script completed successfully.
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ ls my-new-directory
project-info.txt
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$ gcloud config list
[accessibility]
screen_reader = True
[component_manager]
disable_update_check = True
[compute]
gce_metadata_read_timeout_sec = 30
[core]
account = alishror171@gmail.com
disable_usage_reporting = False
project = cloud-alishersk-dev-1
[metrics]
environment = devshell

Your active configuration is: [cloudshell-11423]
alishror171@cloudshell:~ (cloud-alishersk-dev-1)$

```

3. Questions:

- What command did you use to make the script executable?

`chmod +x setup.sh`

- How did you ensure the script was executed correctly?

I ensured the script executed correctly by:

Checking that the my-new-directory and project-info.txt were created using the ls command.

Running gcloud config list to confirm the project configuration was updated.

- What steps did your script automate?

The script automated the following steps:

Creating a new directory.

Creating a simple text file inside the directory.

Setting the default Google Cloud project configuration.