## GitLab CI/CD



GitLab CI/CD is the part of GitLab that you use for all continuous methods (Continuous Integration, Delivery, and Deployment). You can test, create, and publish your code using GitLab CI/CD without the need for any additional integrations or third-party apps.

Read more about GitLab CI/CD here.

Get started with GitLab CI/CD | GitLab

#### What is Terraform?

Terraform is an open-source infrastructure as a code software tool created by HashiCorp. It allows users to define and provision data centre infrastructure using a declarative configuration language called HashiCorp Configuration Language (HCL).

Terraform is designed to manage the entire infrastructure lifecycle, from initial provisioning to ongoing changes and eventual teardown. It takes an immutable approach, reducing the complexity of upgrading or modifying services and infrastructure.



#### What is Terraform | Terraform | HashiCorp Developer

Terraform is an infrastructure as code tool that lets you build, change, and version cloud and onprem resources safely...

#### developer.hashicorp.com

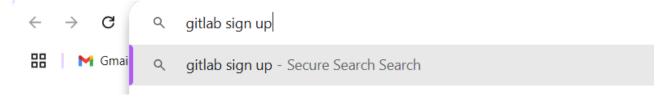
In this tutorial, I have integrated Terraform with GitLab CI/CD and created various resources on AWS.

#### **Prerequisite:**

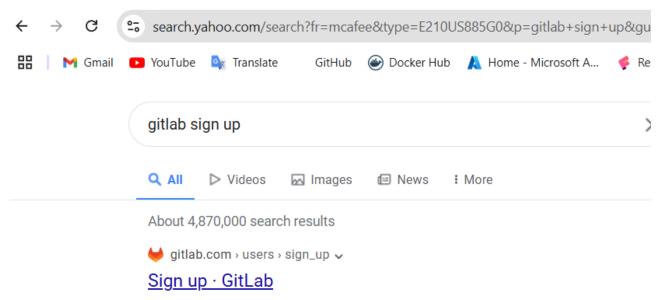
- AWS & GitLab Account
- An access key & secret key created in the AWS
- Basic understanding of AWS, TerraFrom And GitLab CI/CD.

Let's start with the project configuration.

Search gitlab sign up

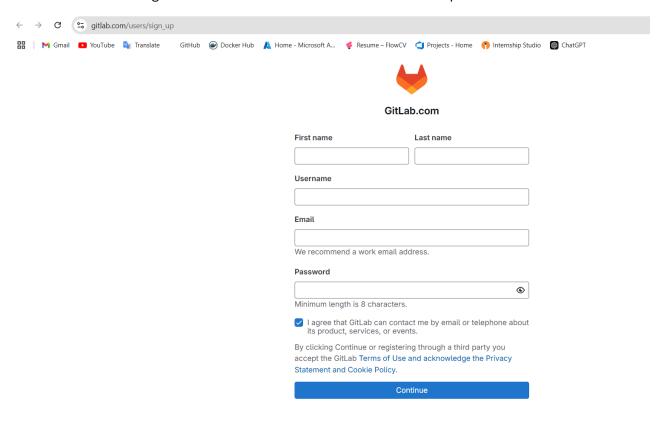


Click on signup

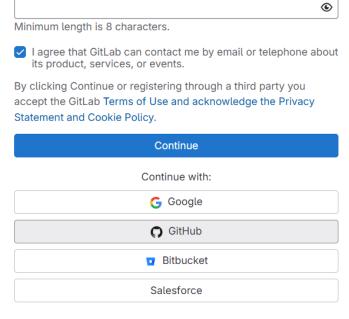


Already have an account? Join **GitLab** today! You and your team can plan, build, a code all in one application. Get started here for free!

- You don't have github account fill this details and continue the process



■ I have git hub so click on git hub



Already have an account? Sign in

- You are not login git hub in your browser it will ask user name and password
- Click on authorize.gitlab and verify it

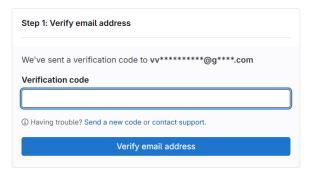


Enter the verification code

You must confirm your email within 3 days of signing up. If you do not confirm your email in this timeframe, your account will be deleted and you will need to sign again.

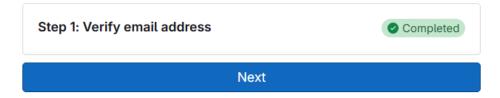
#### Help us keep GitLab secure

You are signed in as vardhan1228. For added security, you'll need to verify your identity in a few quick steps.



# Help us keep GitLab secure

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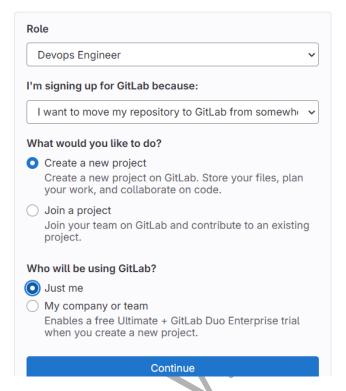
# Verification successful

Your account has been successfully verified. You'll be redirected to your account in just a moment. You can also refresh the page.

#### ■ Fill the details

# Welcome to GitLab, srivardhan!

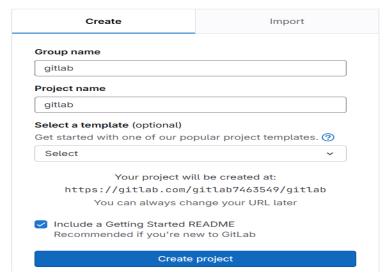
To personalize your GitLab experience, we'd like to know a bit more about you. We won't share this information with anyone.



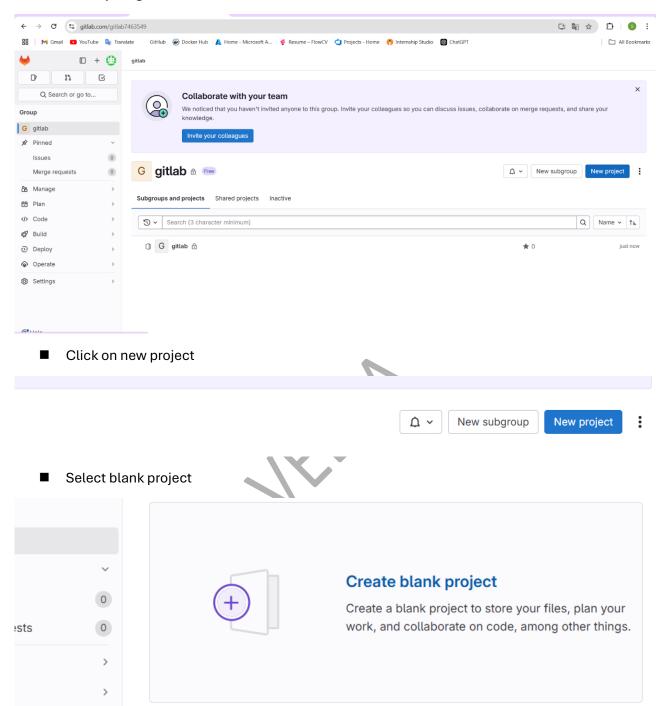
■ Crete your first project

#### Create or import your first project

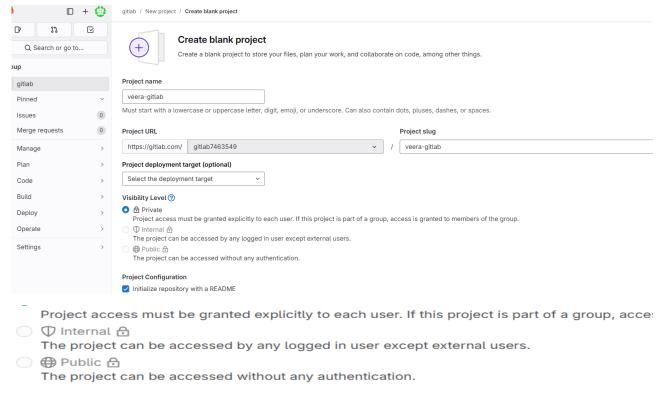
Projects help you organize your work. They contain your file repository, issues, merge requests, and so much more.



■ This is your git lab dashboard



Enter the project name and create project



#### **Project Configuration**

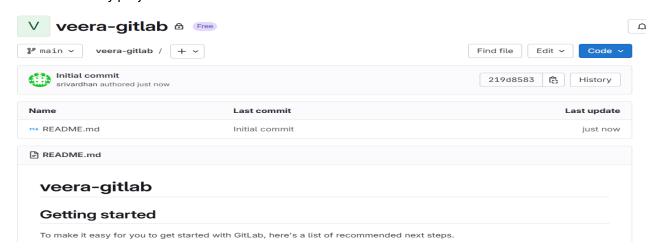
- ✓ Initialize repository with a README
  - Allows you to immediately clone this project's repository. Skip this if you plan to push up an  $\epsilon$
- Enable Static Application Security Testing (SAST)

Analyze your source code for known security vulnerabilities. Learn more.

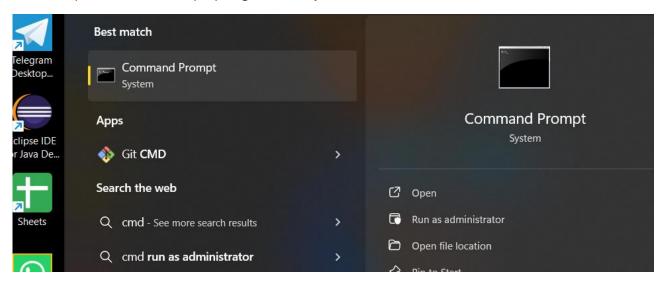
> Experimental settings



■ This is my project



Open cmd in local laptop to generate keys

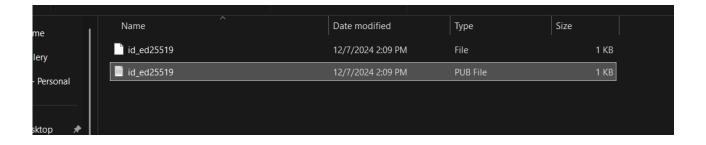


Generate keys

#### ssh-keygen

■ These are ssh keys generated in users .ssh folder

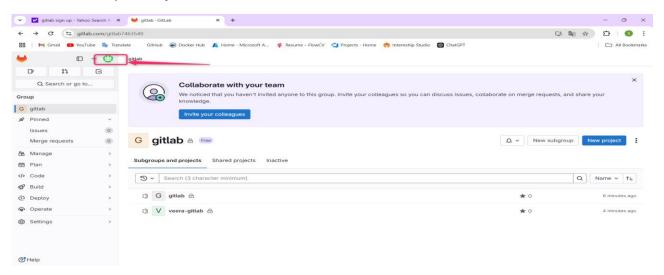
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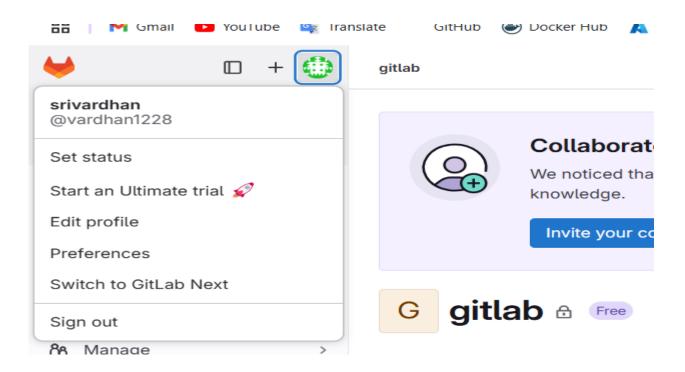
Open the public key and copy it



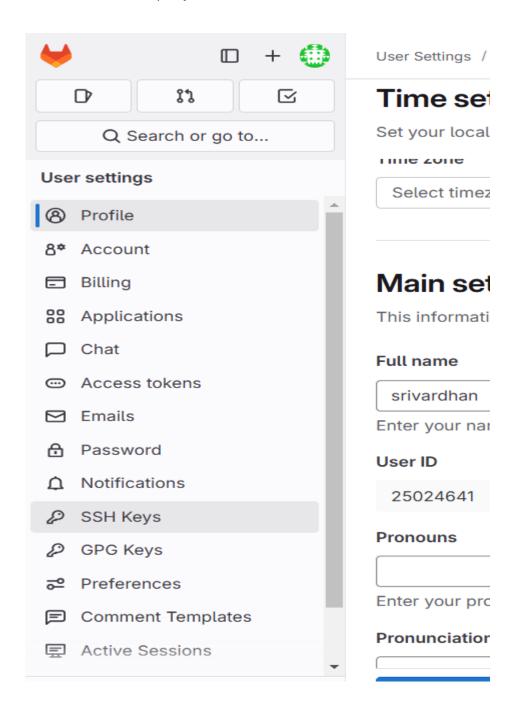
■ Click on profile symbol



■ Click on Edit profile



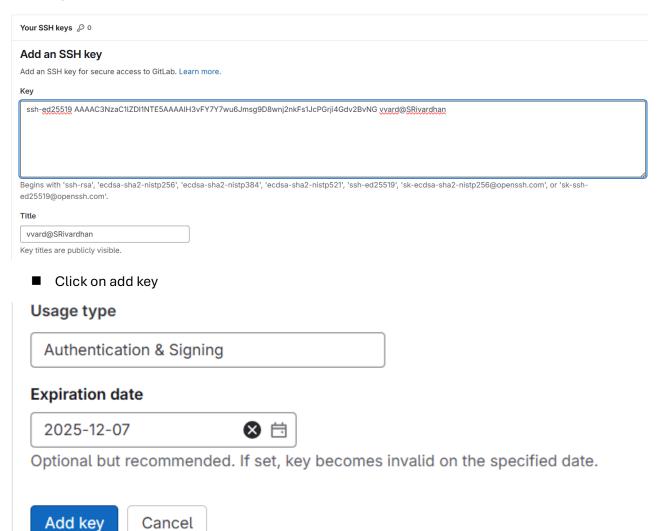
Click on ssh keys



Paste your public key

#### **SSH Keys**

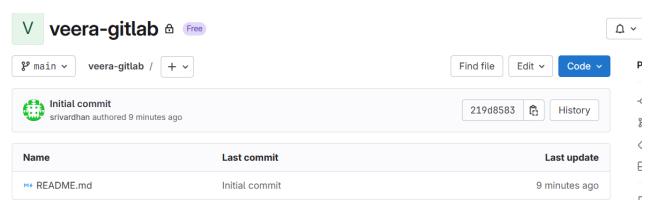
SSH keys allow you to establish a secure connection between your computer and GitLab. SSH fingerprints verify that the client is connecting to the correct host. Check the current instance configuration.



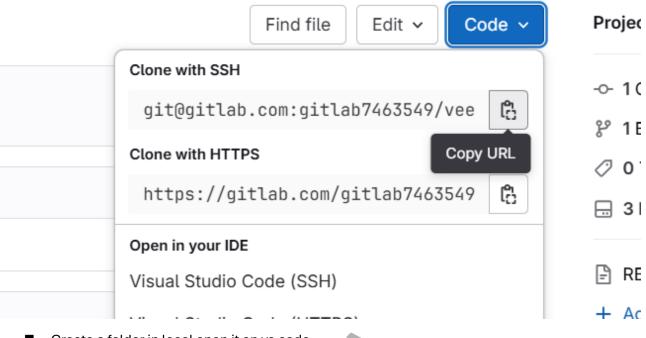
This is path of add keys

User Settings / SSH Keys /

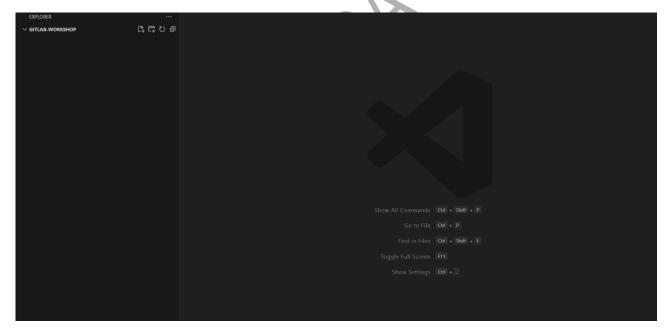
Click on code to copy the ssh url



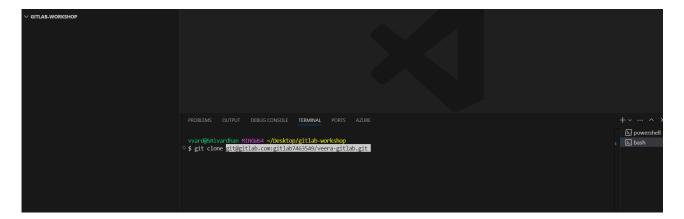
Copy the ssh url



Creete a folder in local open it on vs code

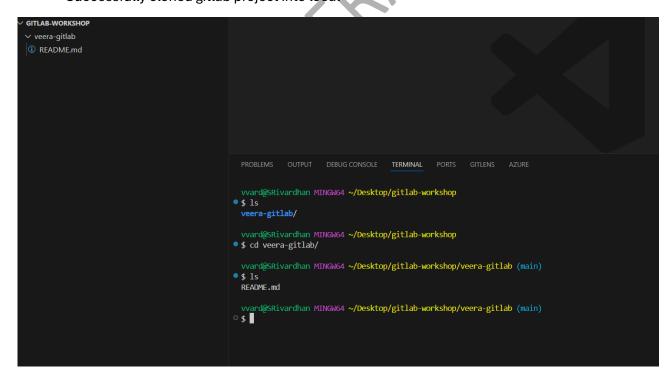


■ Clone the project
git clone <git lab ssh url>

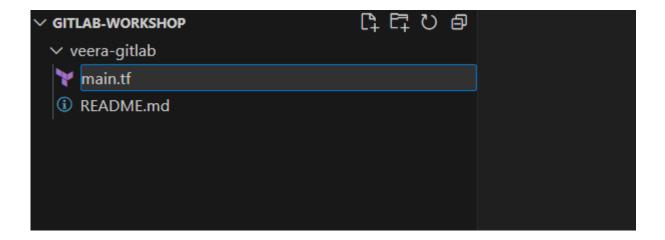


Clone completed

■ Successfully cloned gitlab project into local



Crete a main.tf file in your project



■ Add below script in main.tf

```
provider "aws" {
    region = "ap-south-1"
}
resource "aws_s3_bucket" "gitlab" {
    bucket = "gitlabveeracicd"
}
```

Push the file In to git lab

#### git add.

git commit -m "commit message"

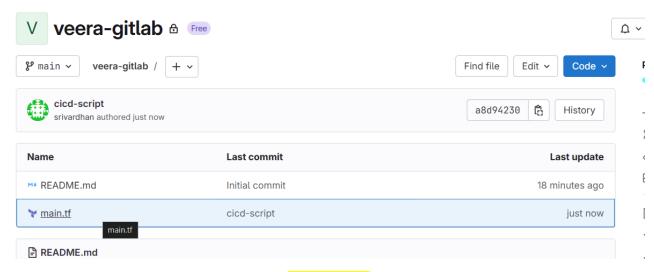
```
vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)

$ git commit -m "cicd-script"
[main a8d9423] cicd-script
  1 file changed, 8 insertions(+)
  create mode 100644 main.tf

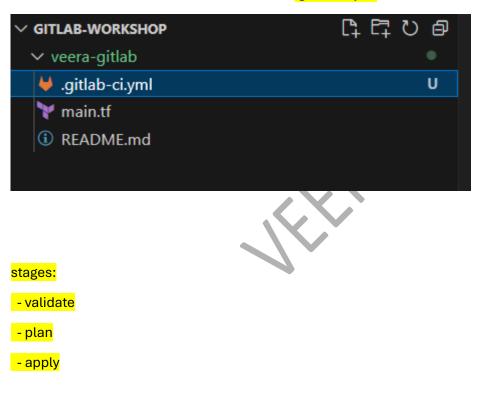
vvard@SRivardhan MINGW64 ~/Deskton/gitlab-workshon/veera-gitlah (main)
```

#### git push

Successfully pushed the file into git lab



■ Create one more file in local nae it as .gitlab-ci.yml



#### <mark>image:</mark>

name: registry.gitlab.com/gitlab-org/terraform-images/stable:latest

#### variables:

AWS\_ACCESS\_KEY\_ID: "\${MY\_AWS\_ACCESS\_KEY\_ID}"

AWS\_SECRET\_ACCESS\_KEY: "\${MY\_AWS\_SECRET\_ACCESS\_KEY\_ID}"

AWS\_REGION: "ap-south-1"

#### before\_script:

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#### Multicloud with devops by veera

- terraform --version
- terraform init

#### <mark>validate:</mark>

stage: validate

script:

- terraform validate

#### <mark>plan:</mark>

stage: plan

script:

- terraform plan

#### <mark>apply:</mark>

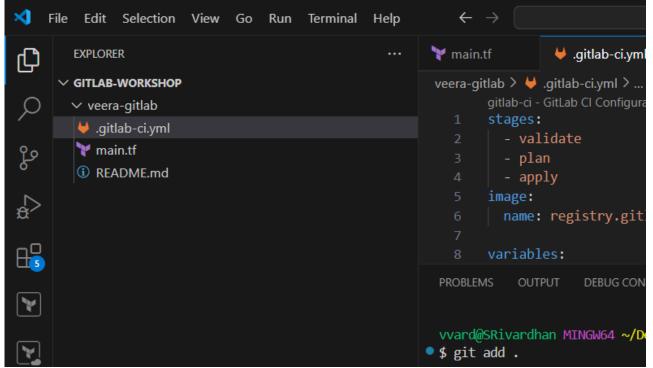
stage: apply

script:

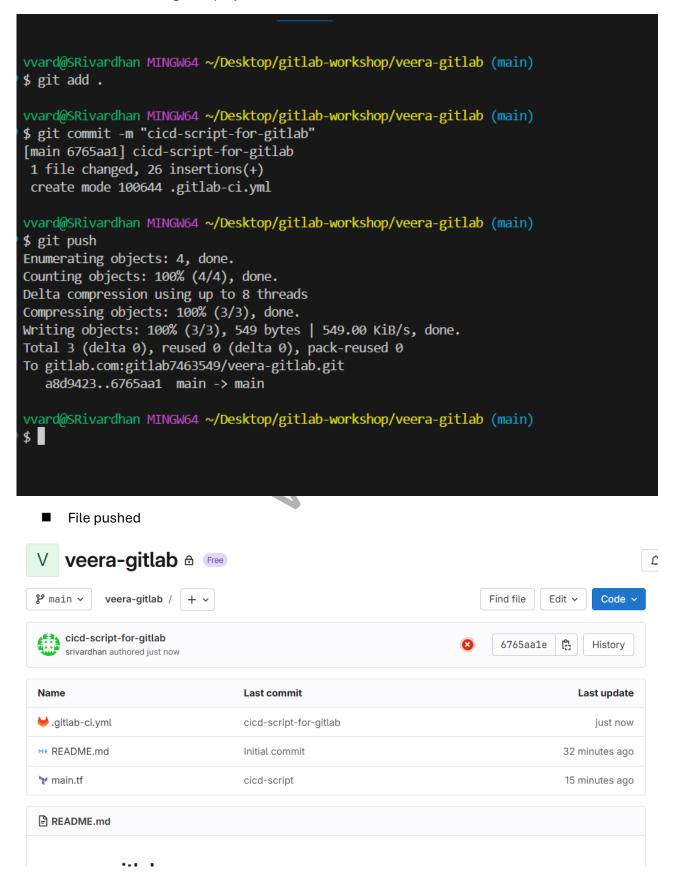
- terraform apply -auto-approve

#when: manual

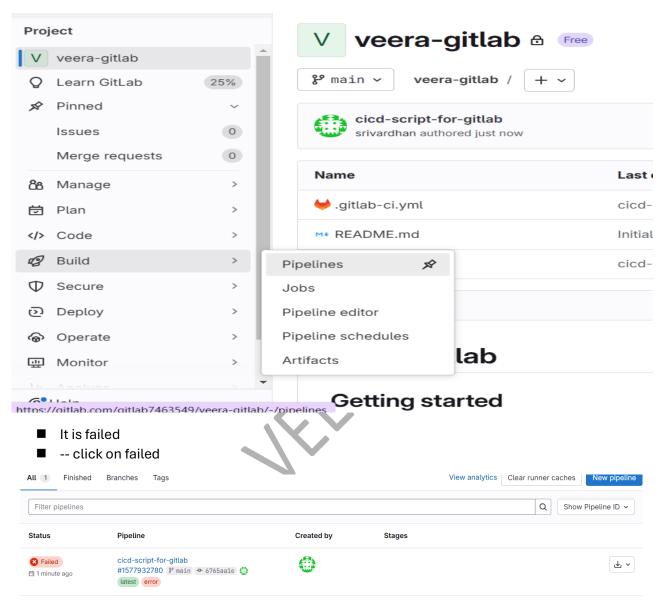




Push the file into git lab project

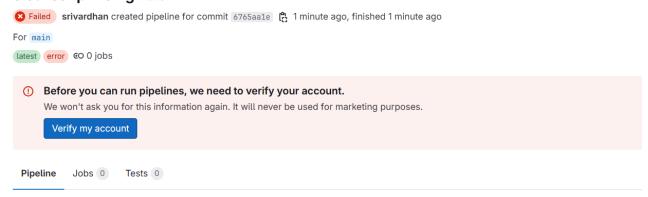


Click on build and select pipeline



■ If incase GIT lab ask like this just proceed for verify my account

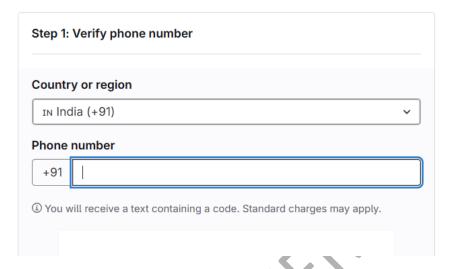
#### cicd-script-for-gitlab



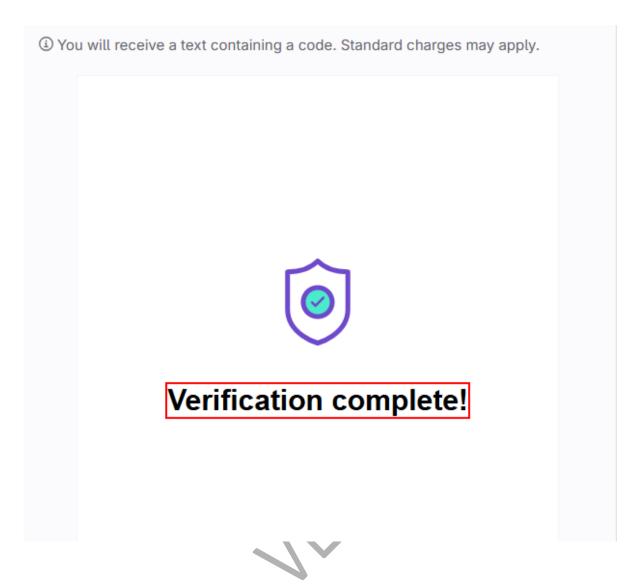
■ Enter your mobile number

# Help us keep GitLab secure

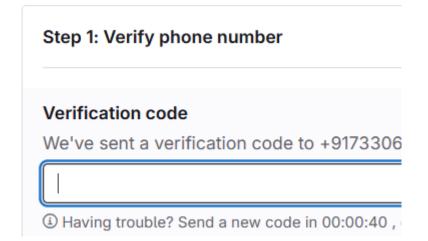
You are signed in as vardhan1228. For added security, you'll need to verify your identity in a few quick steps.



Complete this verification select audio for verification



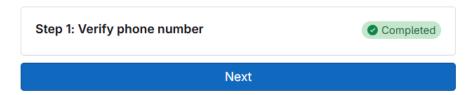
Enter the veification code



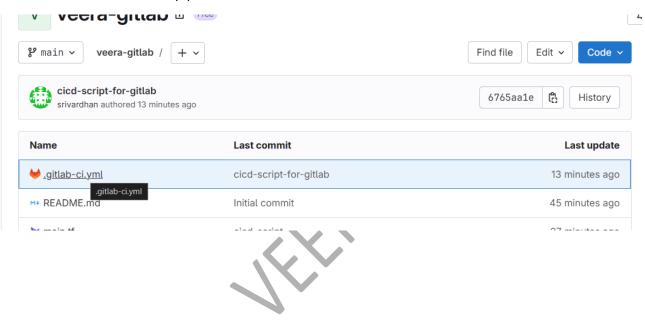
Click on next

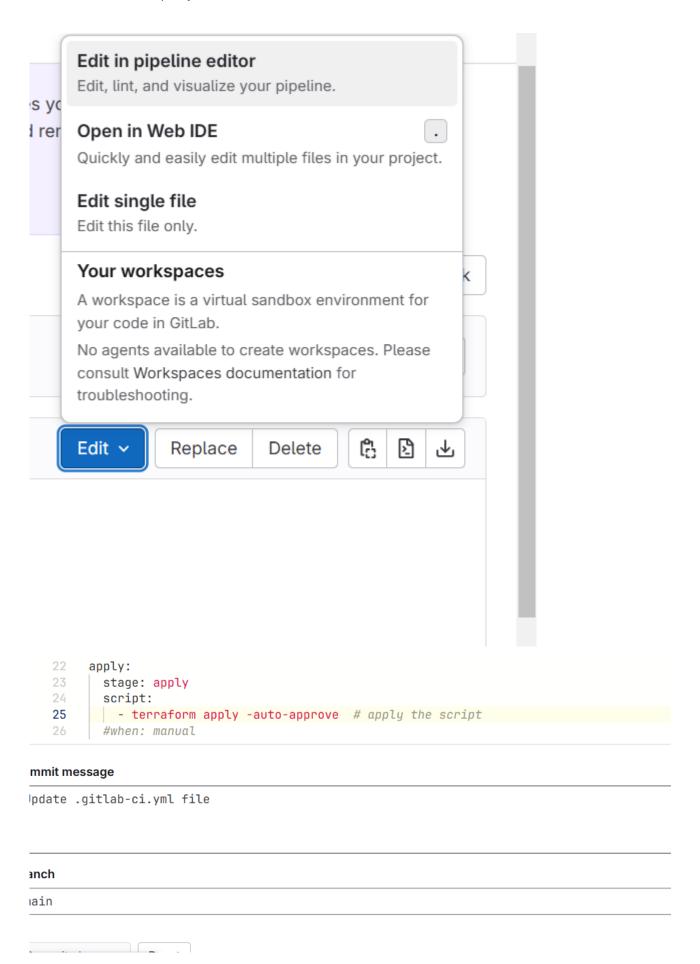
# Help us keep GitLab secure

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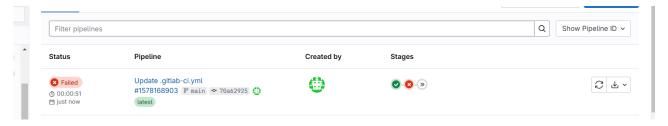


- Open yml file and do modifications and save the file the pipeline will be automatically started
- Other wise strat the pipeline from the build





Build pipeline is failed



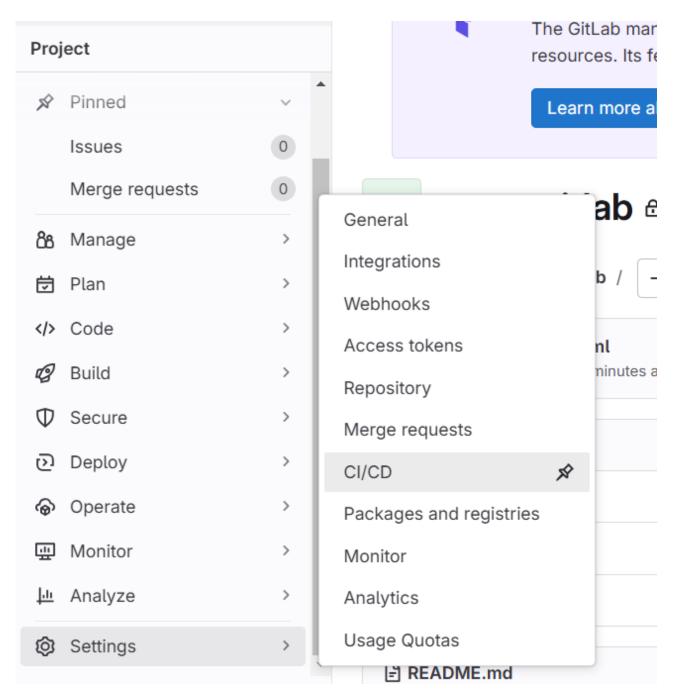
■ Open the pipe line



Error caused by credentials we are not passed any credentials to gitlab variables

```
Jearen visible log output
                                                                                     rerun this command to reinitialize your working directory. If you forget, other
40 commands will detect it and remind you to do so if necessary.
41 $ terraform plan
42 Planning failed. Terraform encountered an error while generating this plan.
      Error: No valid credential sources found
        with provider["registry.terraform.io/hashicorp/aws"],
        on main.tf line 1, in provider "aws":
         1: provider "aws" {
      Please see <a href="https://registry.terraform.io/providers/hashicorp/aws">https://registry.terraform.io/providers/hashicorp/aws</a>
      for more information about providing credentials.
      Error: failed to refresh cached credentials, no EC2 IMDS role found,
      operation error ec2imds: GetMetadata, http response error StatusCode: 404,
      request to EC2 IMDS failed
   Cleaning up project directory and file based variables
   ERROR: Job failed: exit code 1
```

Click on settings and select CICD



#### ■ Click on variables

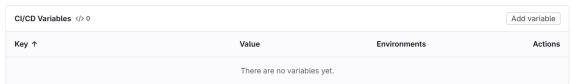
#### Variables

Variables store information that you can use in job scripts. Each project can define a maximum of 8000 variables. Learn more.

Variables can be accidentally exposed in a job log, or maliciously sent to a third party server. The masked variable feature can help reduce the risk of accidentally exposing variable values, but is not a guaranteed method to prevent malicious users from accessing variables. How can I make my variables more secure?

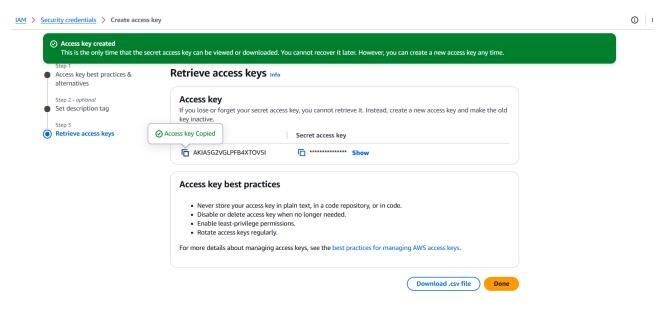
Variables can have several attributes. Learn more.

- Visibility: Set the visibility level for the value. Can be visible, masked, or masked and hidden.
- Flags
  - o Protected: Only exposed to protected branches or protected tags.
  - Expanded: Variables with \$ will be treated as the start of a reference to another variable.



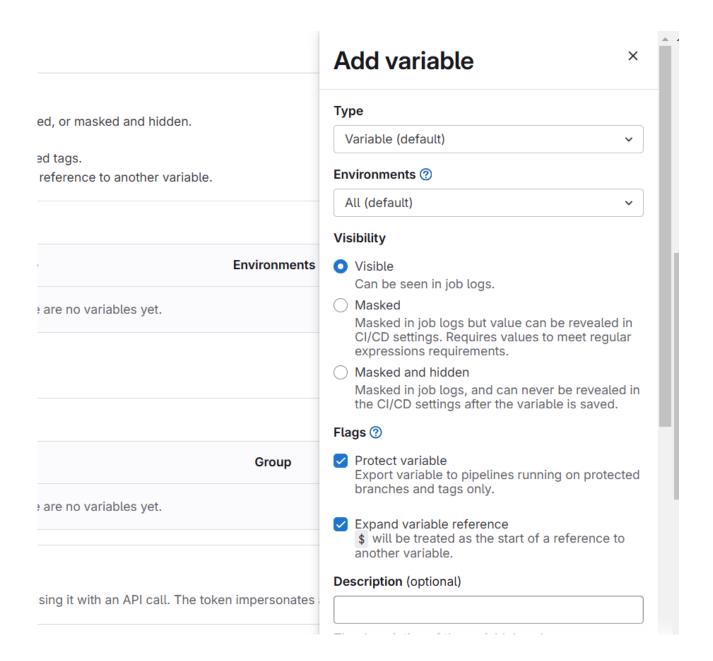
Group variables (inherited)

Generate keys from console



Access key





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	<ul> <li>Masked and hidden</li> <li>Masked in job logs, and can never be revealed in the CI/CD settings after the variable is saved.</li> </ul>	<b>A</b> .
n. able.	Flags <a>②</a> Protect variable Export variable to pipelines running on protected branches and tags only. ✓ Expand variable reference \$ will be treated as the start of a reference to	
Environments	another variable.  Description (optional)	
	The description of the variable's value or usage.  Key  MY_AWS_ACCESS_KEY_ID	
	You can use CI/CD variables with the same name in different places, but the variables might overwrite each other. What is the order of precedence for variables?	
Group	Value  AKIA5G2VGLPFB4XT0V5I	
ne token impersonates	Add variable Cancel	

- Secret access key
- Expand variable reference \$ will be treated as the start of a reference to another variable.

## **Description** (optional)

The description of the variable's value or usage.

## Key

MY\_AWS\_SECRET\_ACCESS\_KEY\_ID

You can use CI/CD variables with the same name in different places, but the variables might overwrite each other. What is the order of precedence for variables?

#### Value

v4NeE1XpNXFkhFz7G1D70v9LkWpJptvcoRfiBM 1y

## Add variable

Cancel

#### Added variables

- Visibility: Set the visibility level for the value. Can be visible, masked, or masked and hidden.
- Flags
  - Protected: Only exposed to protected branches or protected tags.
  - o Expanded: Variables with \$ will be treated as the start of a reference to another variable.

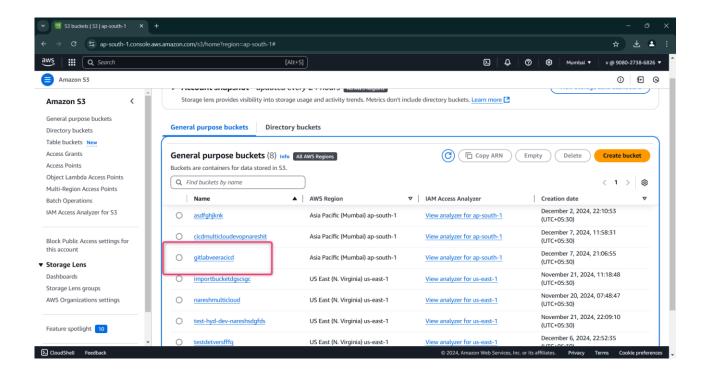
CI/CD Variables  2		Reveal value	es Add variable
Key ↑	Value	Environments	Actions
MY_AWS_ACCESS_KEY_ID (C) Protected Expanded	***** [	All (default) $ [\!\![ \stackrel{oldsymbol{lpha}}{\mathbb{C}} \!\!] $	0 Ū
MY_AWS_SECRET_ACCESS_KEY_ID (2)  Protected Expanded	***** (5	All (default) 🛱	ØŪ

Group variables (inherited)

#### Multicloud with devops by veera

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THANK YOU