

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.



HashiCorp

Terraform

[What is Terraform](#) | [Terraform](#) | [HashiCorp Developer](#)

[Terraform is an infrastructure as code tool that lets you build, change, and version cloud and on-prem resources safely...](#)

developer.hashicorp.com

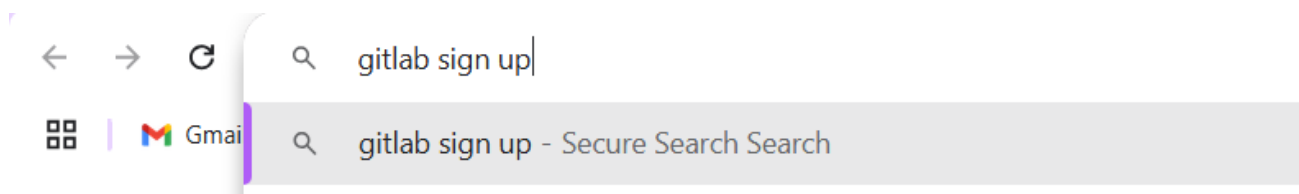
In this tutorial, I have integrated **Terraform** with **GitLab CI/CD** and created various resources on **AWS**.

Prerequisite:

- AWS s GitLab Account
- An access key C 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

gitlab sign up

🔍 All | 📺 Videos | 🖼️ Images | 📰 News | ⋮ More

About 4,870,000 search results

🔥 gitlab.com › users › sign_up ▾

[Sign up · GitLab](#)

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



GitLab.com

First name

Last name

Username

Email

We recommend a work email address.

Password

Minimum length is 8 characters.

☒ I agree that GitLab can contact me by email or telephone about its product, services, or events.

By clicking Continue or registering through a third party you accept the [GitLab Terms of Use](#) and acknowledge the [Privacy Statement](#) and [Cookie Policy](#).

Continue

- I have git hub so click on git hub

Minimum length is 8 characters.

☒ I agree that GitLab can contact me by email or telephone about its product, services, or events.

By clicking Continue or registering through a third party you accept the GitLab [Terms of Use](#) and [acknowledge the Privacy Statement and Cookie Policy](#).

[Continue](#)

Continue with:

[Google](#)

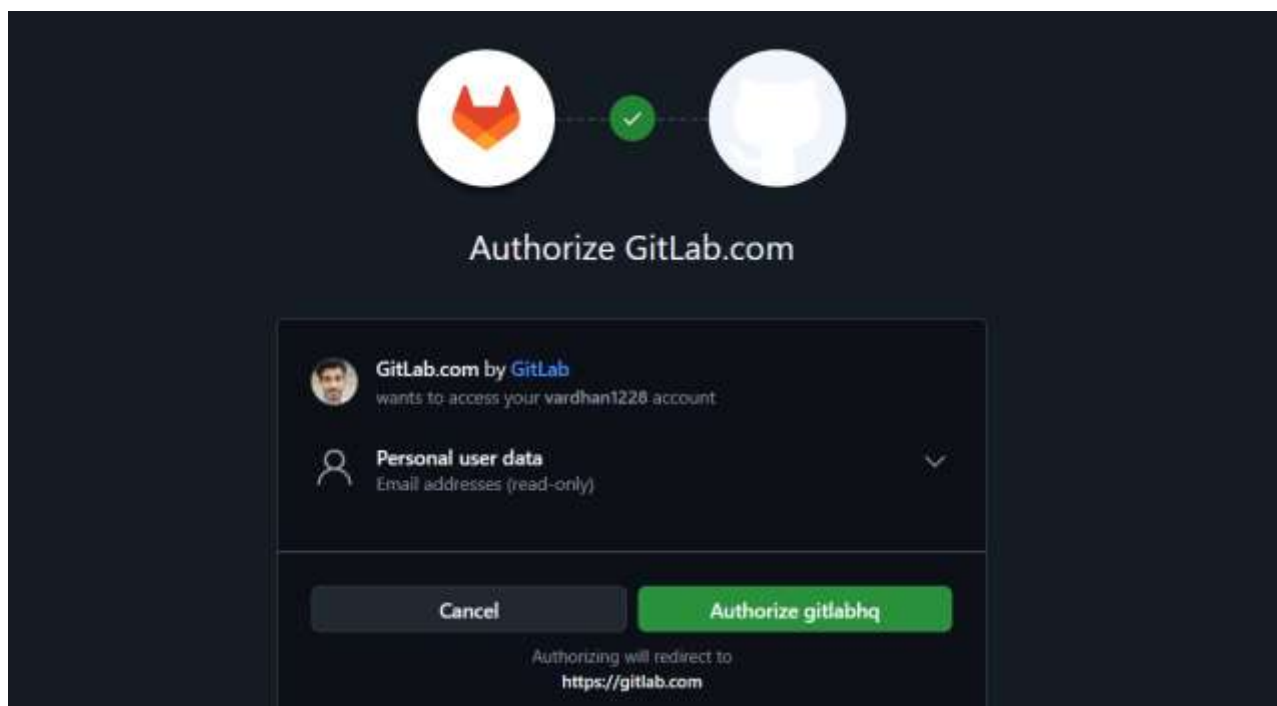
[GitHub](#)

[Bitbucket](#)


[Salesforce](#)

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.

Step 1: Verify email address

We've sent a verification code to vv*****@g****.com

Verification code


 Having trouble? [Send a new code](#) or [contact support](#).

Verify email address

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.

Step 1: Verify email address

 Completed

Next



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.

Role

Devops Engineer

I'm signing up for GitLab because:

I want to move my repository to GitLab from somewhere

What would you like to do?

☒ Create a new project
Create a new project on GitLab. Store your files, plan your work, and collaborate on code.

☐ Join a project
Join your team on GitLab and contribute to an existing project.

Who will be using GitLab?

☒ Just me

☐ My company or team
Enables a free Ultimate + GitLab Duo Enterprise trial when you create a new project.

Continue

- Create 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.

Create

Import

Group name

gitlab

Project name

gitlab

Select a template (optional)
Get started with one of our popular project templates. [?](#)

Select

Your project will be created at:

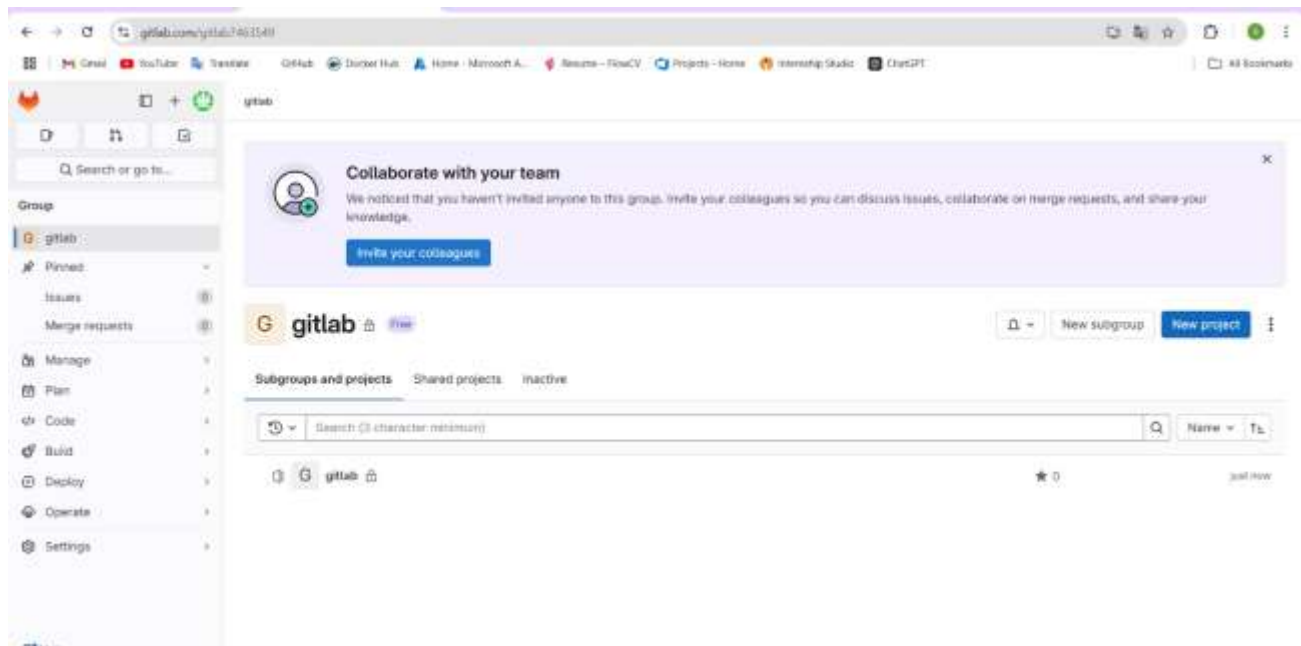
<https://gitlab.com/gitlab7463549/gitlab>

You can always change your URL later

☒ Include a Getting Started README
Recommended if you're new to GitLab

Create project

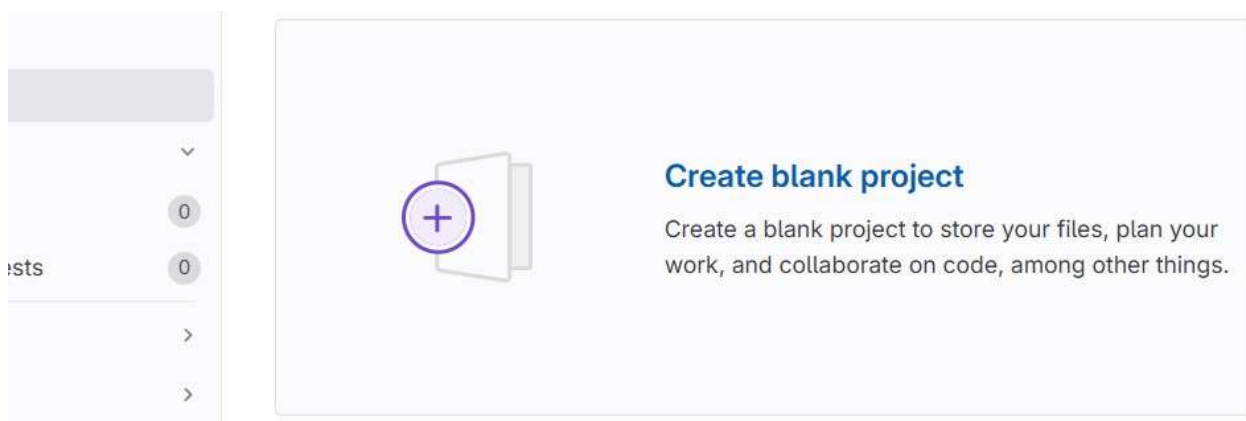
- This is your git lab dashboard



- Click on new project



- Select blank project



■ Enter the project name and create project

gitlab / New project / Create blank project

Create blank project

Create a blank project to store your files, plan your work, and collaborate on code, among other things.

Project name

 Must start with a lowercase or uppercase letter, digit, emoji, or underscore. Can also contain dots, pluses, dashes, or spaces.

Project URL

Project slug

Project deployment target (optional)

Visibility Level

☒ **Private**
 Project access must be granted explicitly to each user. If this project is part of a group, access is granted to members of the group.

☐ **Internal**
 The project can be accessed by any logged in user except external users.

☐ **Public**
 The project can be accessed without any authentication.

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 existing repository.

☐ **Enable Static Application Security Testing (SAST)**
 Analyze your source code for known security vulnerabilities. [Learn more.](#)

> **Experimental settings**

Create project **Cancel**

■ This is my project

veera-gitlab Free

main veera-gitlab / +

Initial commit
 sriyardhan authored just now 219d8583 [History](#)

Name	Last commit	Last update
→ README.md	Initial commit	just now

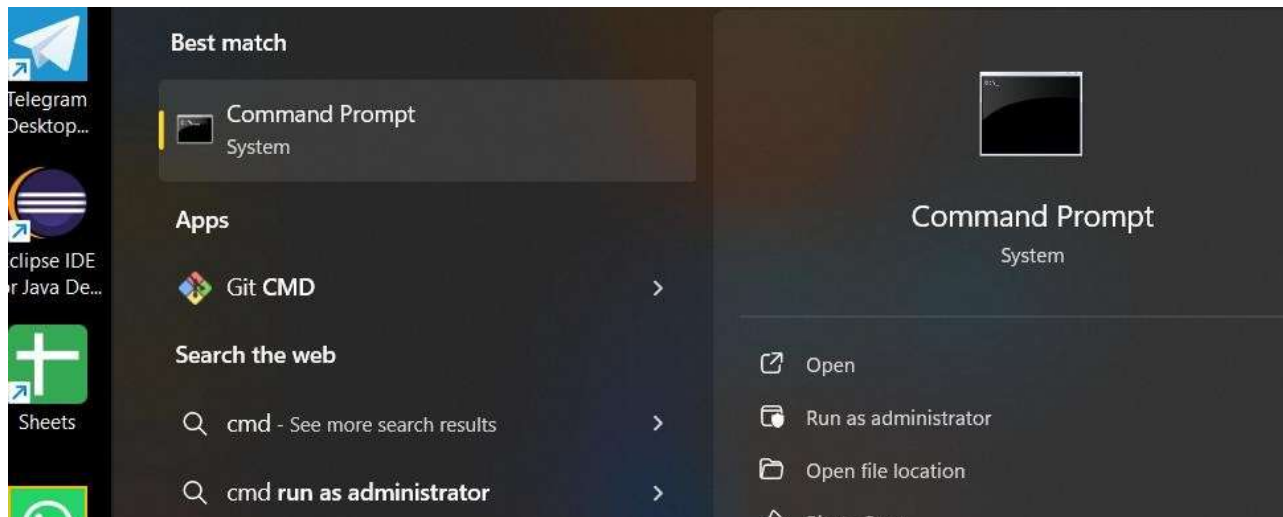
README.md

veera-gitlab

Getting started

To make it easy for you to get started with GitLab, here's a list of recommended next steps.

- Open cmd in local laptop to generate keys



- Generate keys

ssh-keygen

```
C:\Users\vvard>ssh-keygen
Generating public/private ed25519 key pair.
Enter file in which to save the key (C:\Users\vvard/.ssh/id_ed25519):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in C:\Users\vvard/.ssh/id_ed25519
Your public key has been saved in C:\Users\vvard/.ssh/id_ed25519.pub
The key fingerprint is:
SHA256:WirI3uzhM032DSQDZq4y9GHVSSfgp8Q9LpLUhL/5FyA vvard@SRivardhan
The key's randomart image is:
+--[ED25519 256]--+
|      .+= .      |
|      o.= +      |
|      + *. *      |
|      + .+ *E..   |
|      ..oo=..S .  |
|      .ooo.+.* .  |
|      + =.+ + .   |
|      .o B.o o . . |
|      .o*.. . .   |
+----[SHA256]-----+

C:\Users\vvard>
```

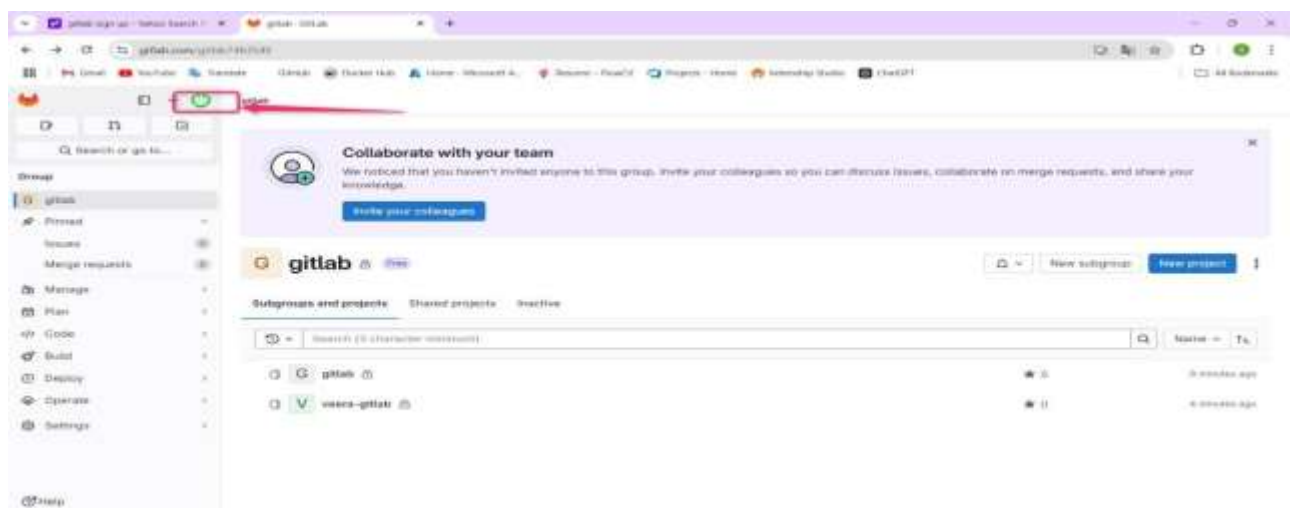
- These are ssh keys generated in users .ssh folder

Name	Date modified	Type	Size
id_ed25519	12/7/2024 2:09 PM	File	1 KB
id_ed25519	12/7/2024 2:09 PM	PUB File	1 KB

- Open the public key and copy it





```
ssh-ed25519 AAAAC3NzaC1lZD11NTE5AAAAIH3vFY7Y7wu6Jmsg9D8wnj2nkFsLJcPGri4Gdv2BvNG-vvard@SRivardhian
```

- Click on profile symbol




- Click on Edit profile

Navigation bar: Gmail, YouTube, Translate, GitHub, Docker Hub



srivardhan
@vardhan1228

Set status

Start an Ultimate trial 


Edit profile

Preferences


Switch to GitLab Next


Sign out


gitlab




Collaborate
We noticed that you have shared knowledge.
[Invite your colleagues](#)









gitlab  [Free](#)


 Manage >

- Click on ssh keys











 Search or go to...


User settings


 Profile


 Account


 Billing


 Applications


 Chat


 Access tokens


 Emails


 Password


 Notifications

 SSH Keys

 GPG Keys

 Preferences

 Comment Templates

 Active Sessions

User Settings /

Time set

Set your local

TIME ZONE

Select timez

Main set

This informati

Full name

srivardhan

Enter your nar

User ID

25024641

Pronouns

Enter your pro

Pronunciator

- 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](#).

Your SSH keys

Add an SSH key

Add an SSH key for secure access to GitLab. [Learn more.](#)

Key

ssh-ed25519 AAAAC3NzaC1lZD11NTE5AAAAIH3vFY7Y7wu6Jmsg9D8wnj2nkFs1JcPGrj4Gdv2BvNG yvard@SRivardhan

Begin with 'ssh-rsa', 'ecdsa-sha2-nistp256', 'ecdsa-sha2-nistp384', 'ecdsa-sha2-nistp521', 'ssh-ed25519', 'sk-ecdsa-sha2-nistp256@openssh.com', or 'sk-ssh-ed25519@openssh.com'.

Title

yvard@SRivardhan

Key titles are publicly visible.

- Click on add key

Usage type

Authentication & Signing

Expiration date

2025-12-07

Optional but recommended. If set, key becomes invalid on the specified date.

Add key

Cancel

- This is path of add keys

User Settings / SSH Keys /

- Click on code to copy the ssh url

V

veera-gitlab

Free

main

veera-gitlab

+

Find file

Edit

Code

Initial commit

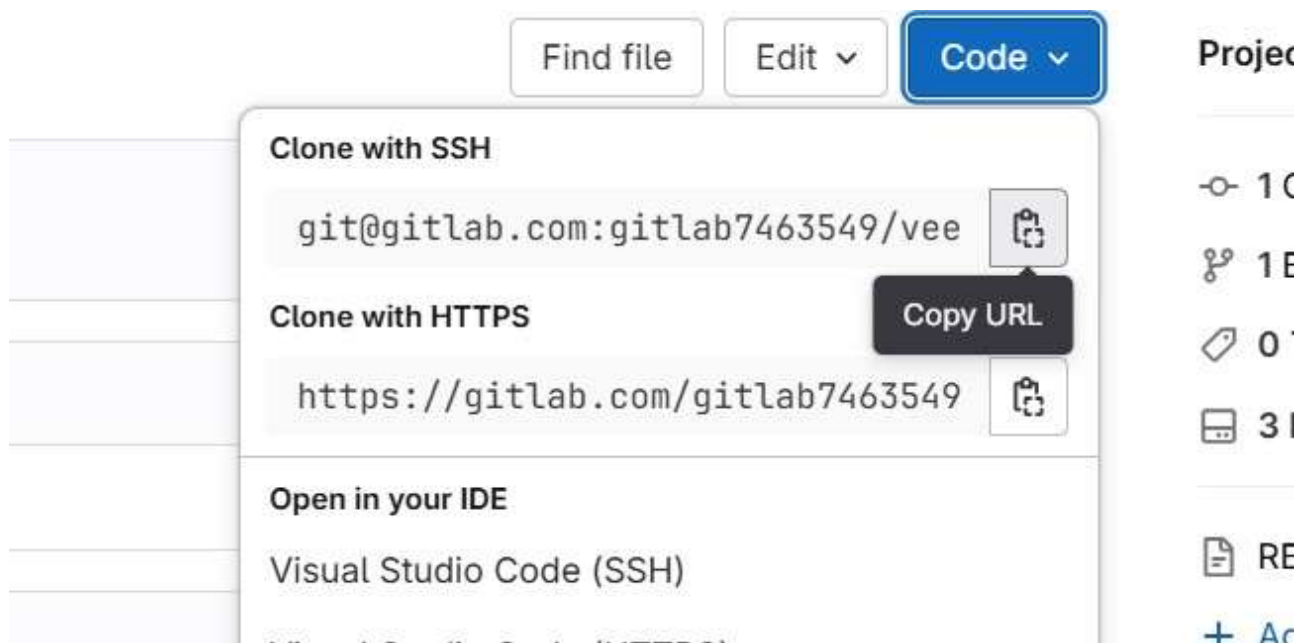
srivardhan authored 9 minutes ago

219d8583

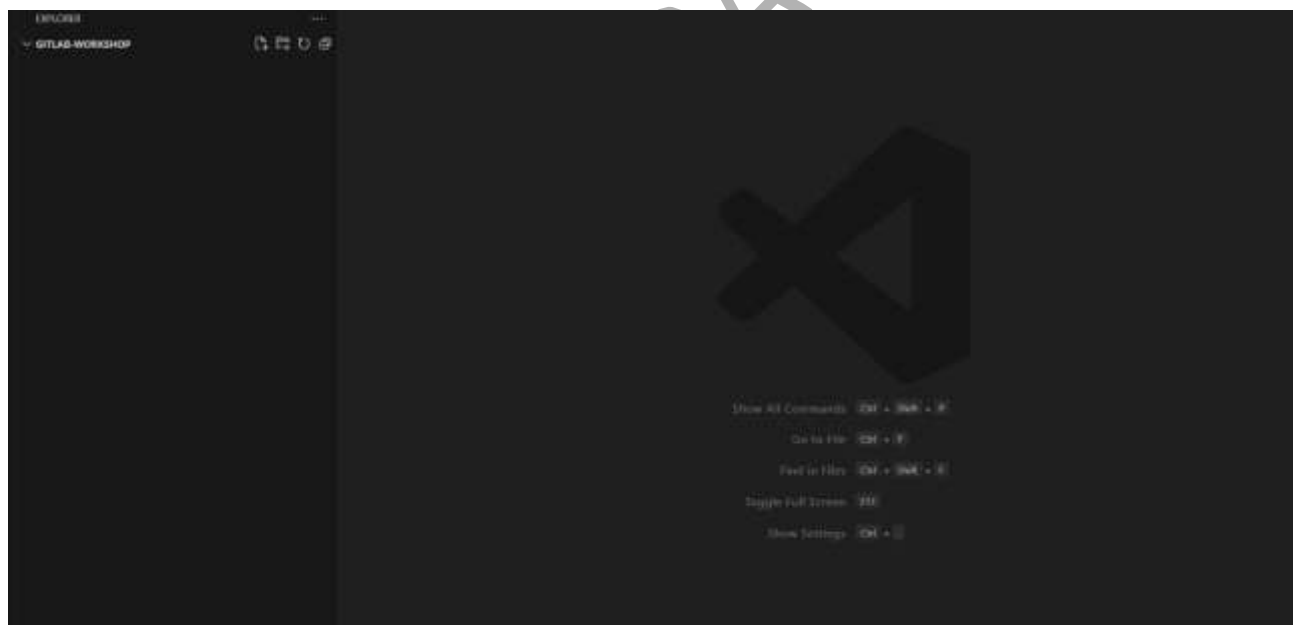
History

Name	Last commit	Last update
README.md	Initial commit	9 minutes ago

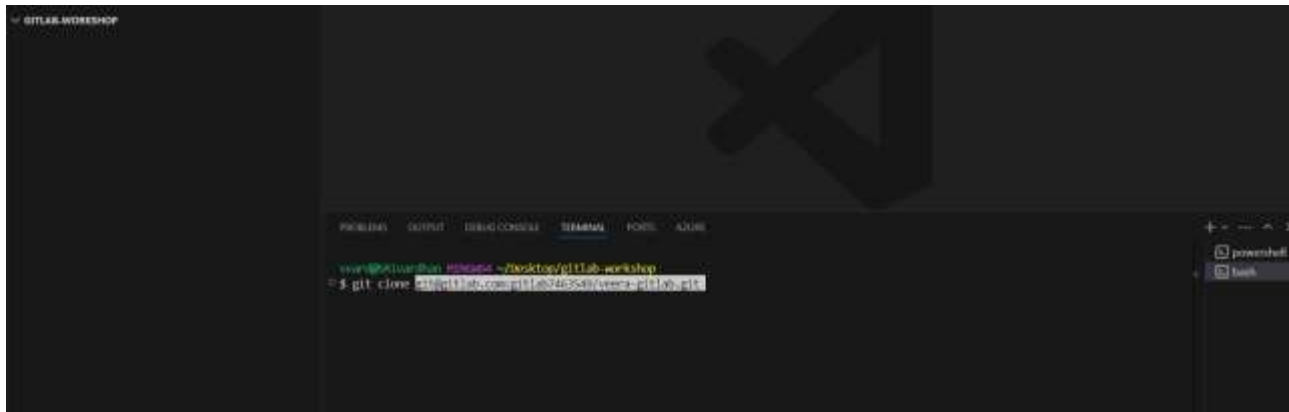
- Copy the ssh url



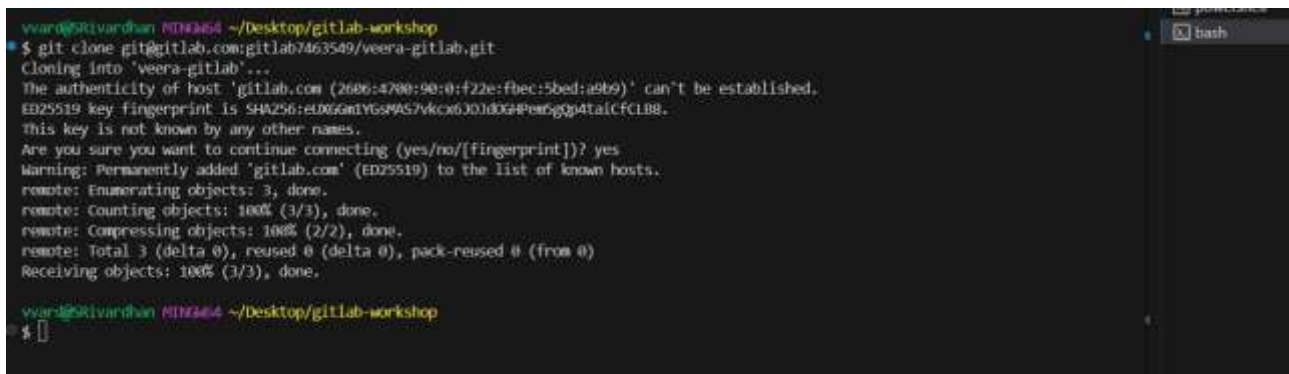
- Create a folder in local open it on vs code



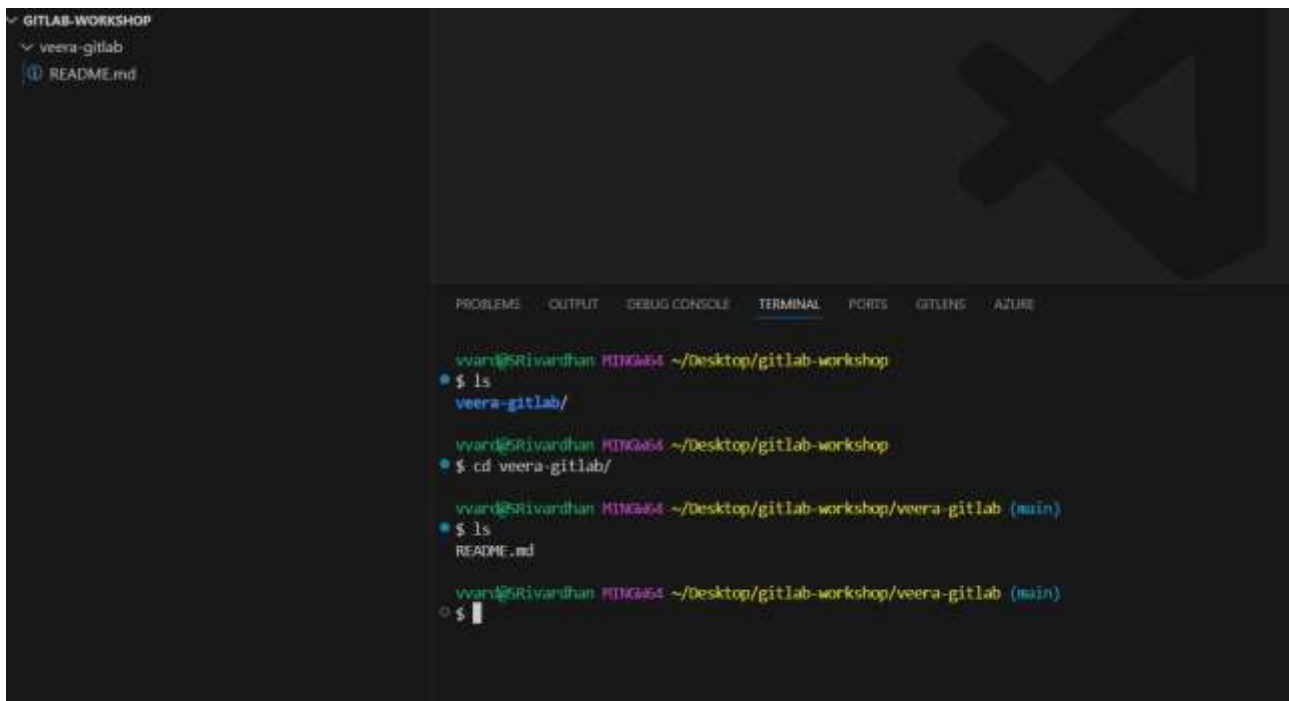
- Clone the project
`git clone <git lab ssh url>`



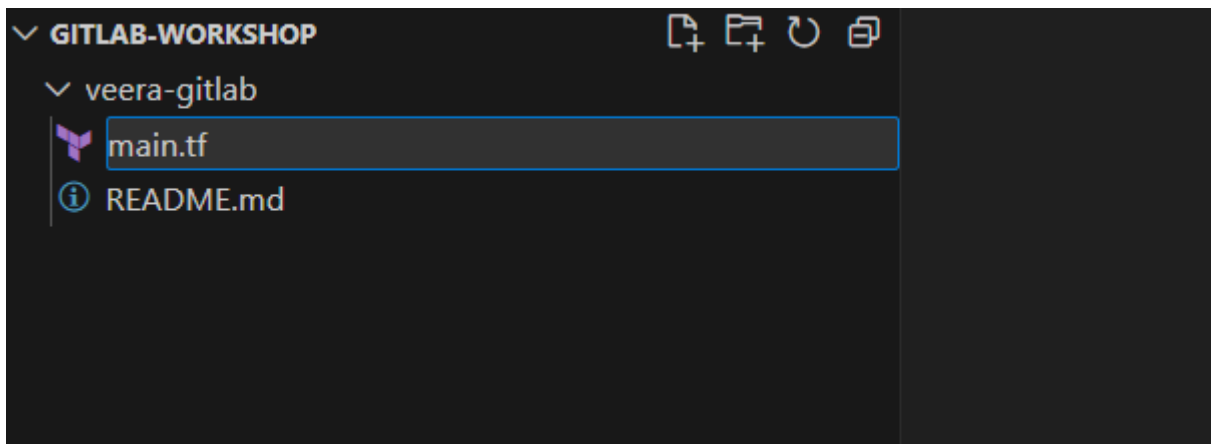
- Clone completed



- Successfully cloned gitlab project into local

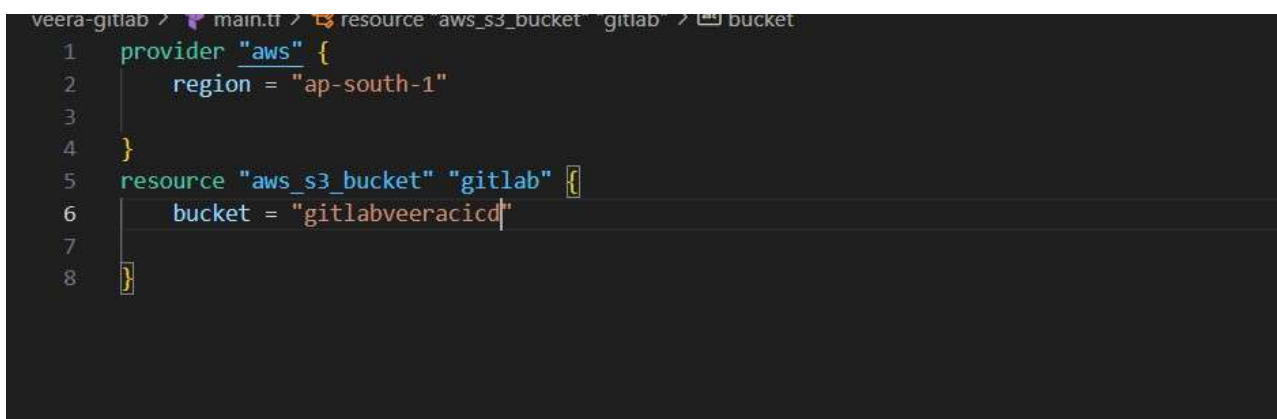


- Create a main.tf file in your project



- Add below script in main.tf

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



- Push the file In to git lab


```
vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)
$ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
      main.tf

nothing added to commit but untracked files present (use "git add" to track)

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

git add .

```
vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)
$ git add .

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

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

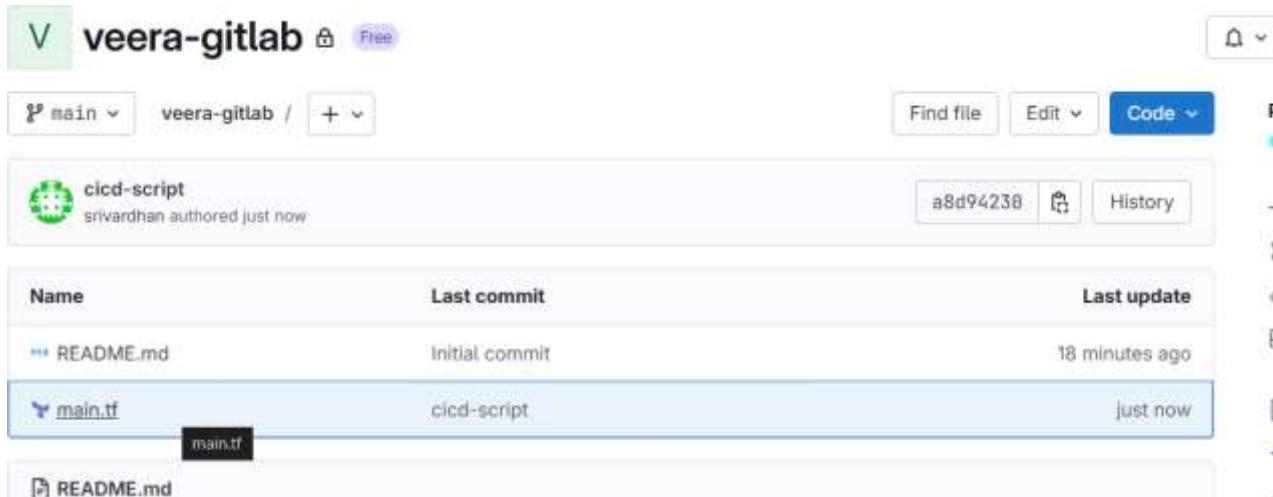
vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)
```

git push

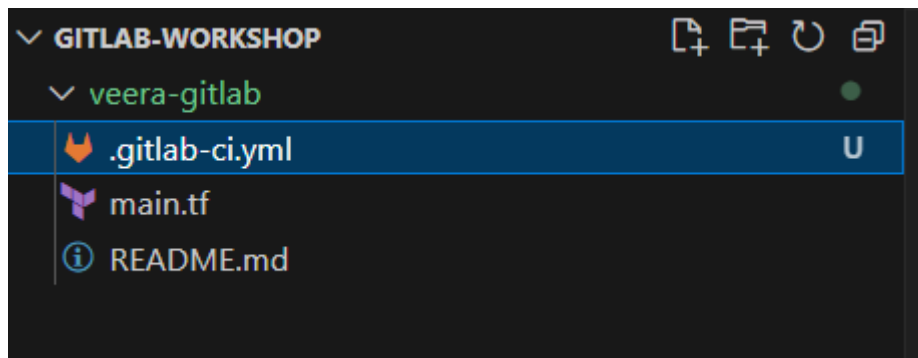
```
vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)
$ git push
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 363 bytes | 363.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To gitlab.com:gitlab7463549/veera-gitlab.git
 219d858..a8d9423  main -> main

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

- Successfully pushed the file into git lab



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



stages:

- validate
- plan
- apply

image:

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:

- terraform --version

- terraform init

validate:

stage: validate

script:

- terraform validate

plan:

stage: plan

script:

- terraform plan

apply:

stage: apply

script:

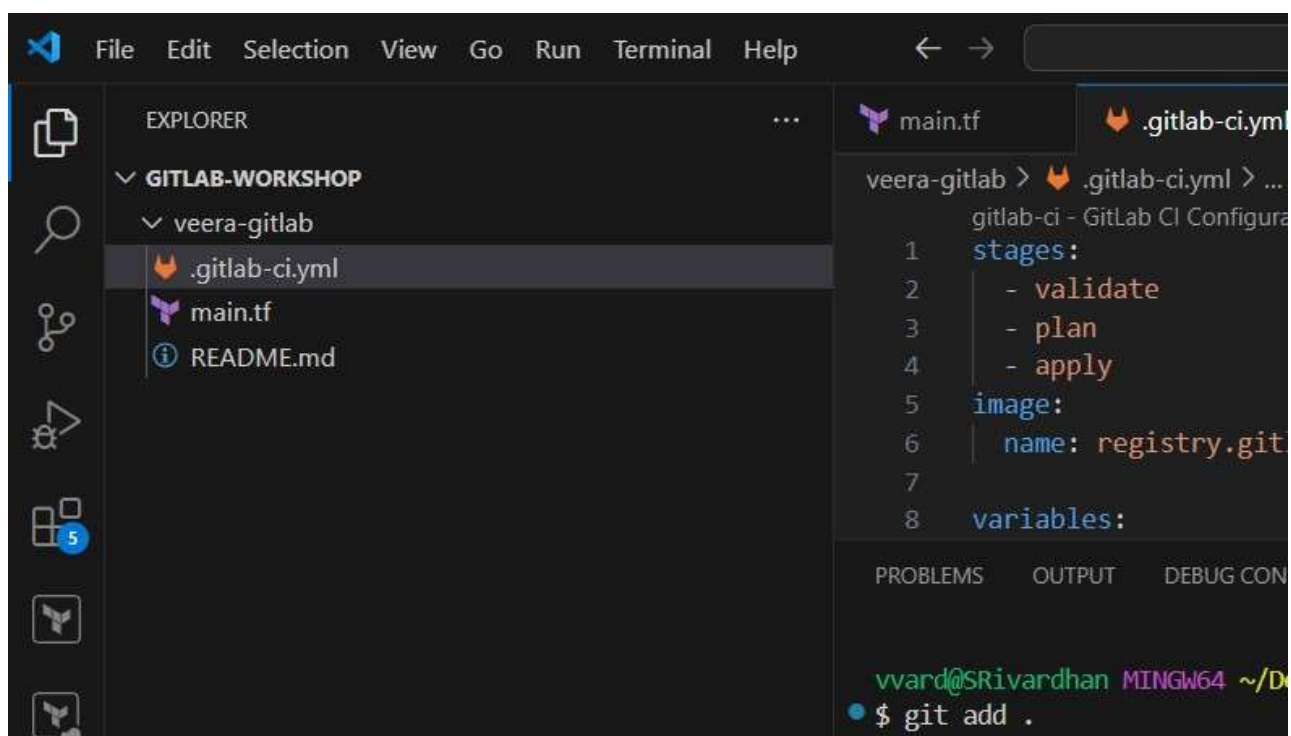
- terraform apply -auto-approve

#when: manual

```

1  stages:
2    - validate
3    - plan
4    - apply
5  image:
6    name: registry.gitlab.com/gitlab.org/terraform-images/satble:latest
7
8  variables:
9    AWS_ACCESS_KEY_ID: "${MY_AWS_ACCESS_KEY_ID}"
10   AWS_SECRET_ACCESS_KEY_ID: "${MY_AWS_SECRET_ACCESS_KEY_ID}"
11  before_script:
12    - terraform --version
13    - terraform init
14  validate:
15    stage: validate
16    script:
17      - terraform validate
18  plan:
19    stage: plan
20    script:
21      - terraform plan
22  apply:
23    stage: apply
24    script:
25      - terraform apply -auto-approve
26  when: manual

```



- Push the file into git lab project



```
vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)
$ git add .

vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)
$ git commit -m "cicd-script-for-gitlab"
[main 6765aa1] cicd-script-for-gitlab
 1 file changed, 26 insertions(+)
 create mode 100644 .gitlab-ci.yml

vvard@SRivardhan MINGW64 ~/Desktop/gitlab-workshop/veera-gitlab (main)
$ git push
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 549 bytes | 549.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
To gitlab.com:gitlab7463549/veera-gitlab.git
 a8d9423..6765aa1  main -> main

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

- File pushed

 **veera-gitlab**  Free

main ▾


veera-gitlab /

+


Find file

Edit ▾


Code ▾

 cicd-script-for-gitlab




srivardhan authored just now




6765aa1



History

Name	Last commit	Last update
 .gitlab-ci.yml	cicd-script-for-gitlab	just now
 README.md	Initial commit	32 minutes ago
 main.tf	cicd-script	15 minutes ago

 README.md

...

- Click on build and select pipeline

The screenshot shows the GitLab interface for a project named 'veera-gitlab'. On the left, a sidebar contains a 'Project' menu with options like 'Learn GitLab', 'Pinned', 'Issues', 'Merge requests', 'Manage', 'Plan', 'Code', 'Build', 'Secure', 'Deploy', 'Operate', and 'Monitor'. The 'Build' option is highlighted, and a dropdown menu is open showing 'Pipelines', 'Jobs', 'Pipeline editor', 'Pipeline schedules', and 'Artifacts'. The main content area displays the repository 'cicd-script-for-gitlab' by 'srivardhan'. It shows a table of files with columns 'Name' and 'Last commit'. The files listed are '.gitlab-ci.yml' (last commit by 'cicd-') and 'README.md' (last commit 'Initial'). Below the table, there's a 'Getting started' section.

- It is failed
- -- click on failed

The screenshot shows the 'Pipelines' page in GitLab. At the top, there are tabs for 'All', 'Finished', 'Branches', and 'Tags'. Below these is a search bar and a 'Show Pipeline ID' dropdown. The main table has columns 'Status', 'Pipeline', 'Created by', and 'Stages'. The first row shows a pipeline named 'cicd-script-for-gitlab' with status 'Failed' and a message '1 minute ago'. Below the table, there's a message: 'Before you can run pipelines, we need to verify your account. We won't ask you for this information again. It will never be used for marketing purposes. Verify my account.'

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

cicd-script-for-gitlab

Failed srivardhan created pipeline for commit 6765aa1e 1 minute ago, finished 1 minute ago

For main

latest error 0/0 jobs

Before you can run pipelines, we need to verify your account.
We won't ask you for this information again. It will never be used for marketing purposes.

[Verify my account](#)

Pipeline Jobs 0 Tests 0

- 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.

Step 1: Verify phone number

Country or region

IN India (+91)

Phone number

+91

|

ⓘ You will receive a text containing a code. Standard charges may apply.

Complete this verification select audio for verification

① You will receive a text containing a code. Standard charges may apply.



Verification complete!

- Enter the verification code

Step 1: Verify phone number

Verification code

We've sent a verification code to +9173306

① Having trouble? Send a new code in 00:00:40 ,

Click on next

Help us keep GitLab secure

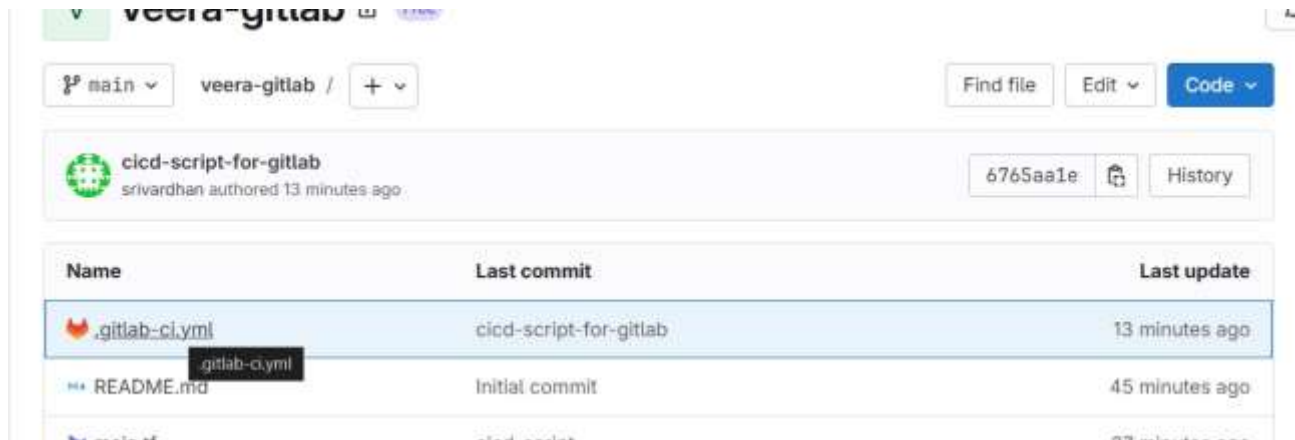
You are signed in as vardhan1228. For added security, you'll need to verify your identity in a few quick steps.

Step 1: Verify phone number


✓ Completed

Next

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



The screenshot shows the GitLab interface for a repository named 'veera-gitlab'. The current branch is 'main'. The file path is 'veera-gitlab / +'. The commit hash is '6765aa1e'. The commit message is 'cicd-script-for-gitlab' by 'srivardhan' 13 minutes ago. The commit history table is as follows:

Name	Last commit	Last update
 .gitlab-ci.yml	cicd-script-for-gitlab	13 minutes ago
README.md	Initial commit	45 minutes ago

Edit in pipeline editor

Edit, lint, and visualize your pipeline.

Open in Web IDE

Quickly and easily edit multiple files in your project.

Edit single file

Edit this file only.

Your workspaces

A workspace is a virtual sandbox environment for your code in GitLab.

No agents available to create workspaces. Please consult Workspaces documentation for troubleshooting.

Edit ▾

Replace

Delete



```
22  apply:
23    stage: apply
24    script:
25      - terraform apply -auto-approve # apply the script
26    #when: manual
```

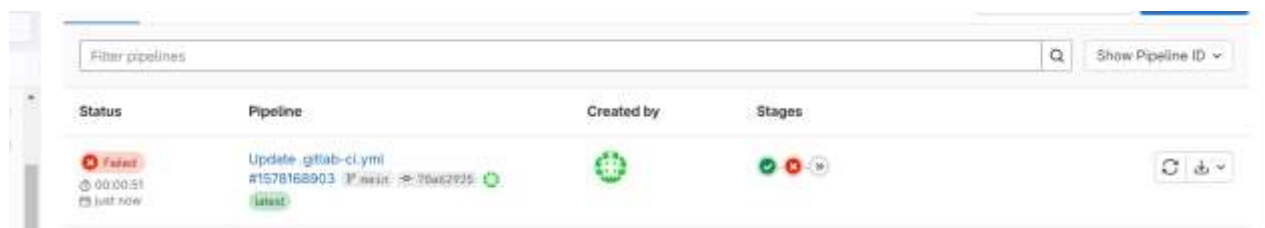
commit message

update .gitlab-ci.yml file

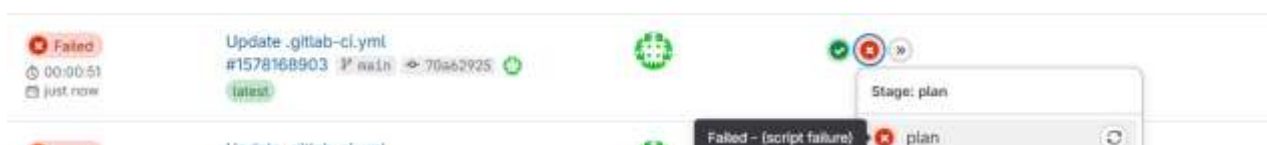
branch

main

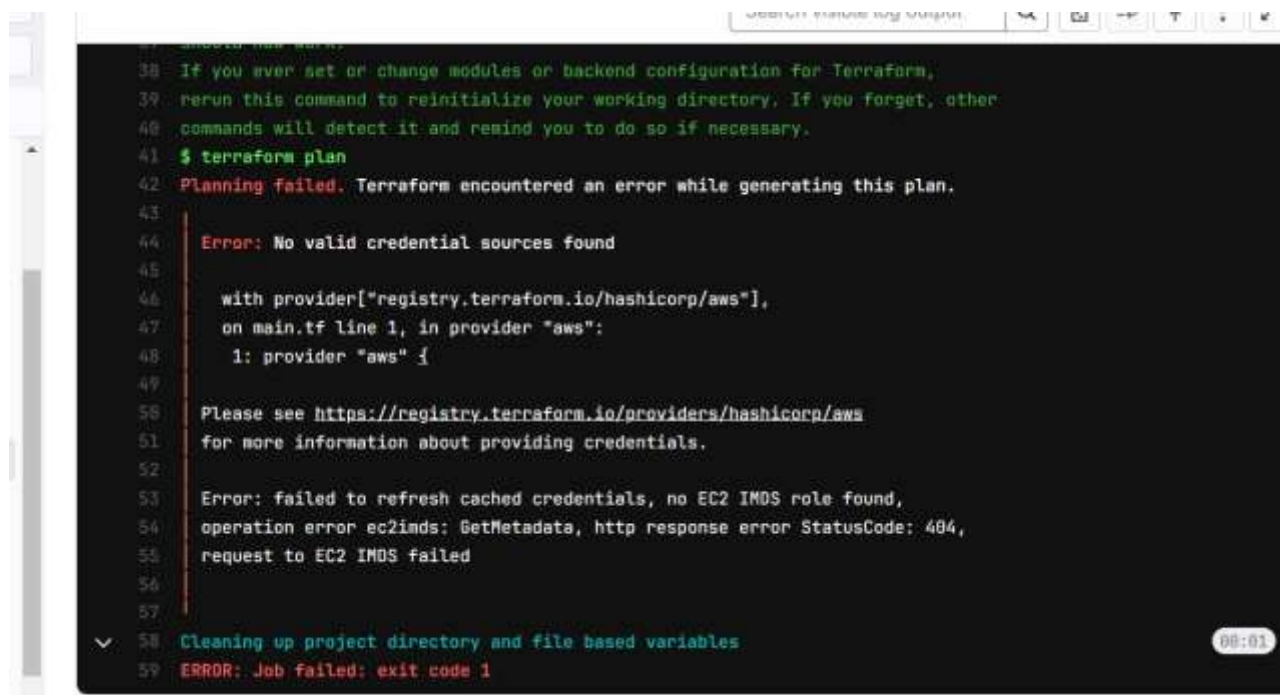
- Build pipeline is failed



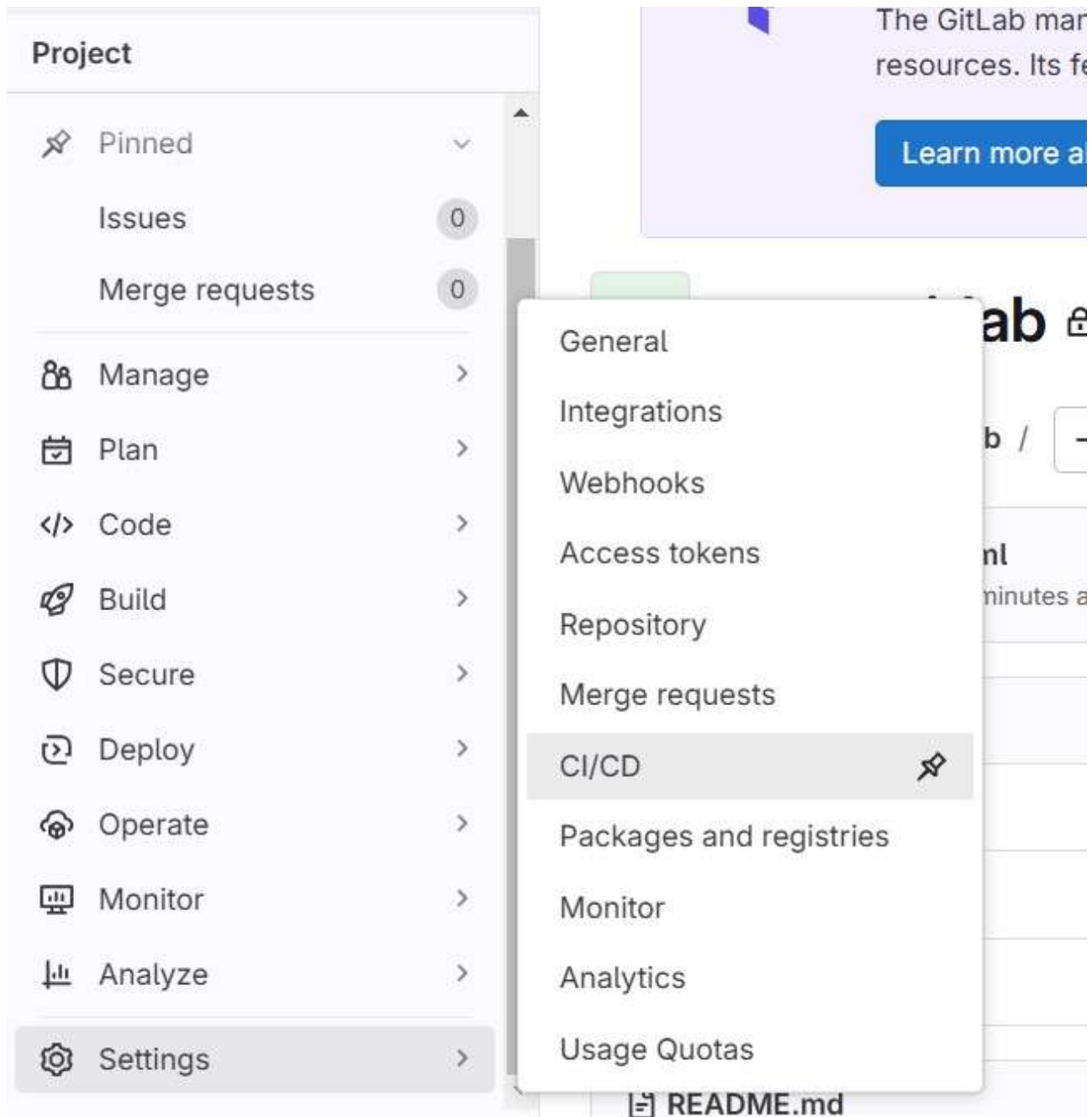
- Open the pipe line



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



- 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**
 - **Protected:** Only exposed to protected branches or protected tags.
 - **Expanded:** Variables with `$` will be treated as the start of a reference to another variable.

CI/CD Variables </> 0 Add variable			
Key ↑	Value	Environments	Actions
There are no variables yet.			

Group variables (inherited)

■ Generate keys from console

IAM > Security credentials > Create access key

Access key created
This is the only time that the secret access key can be viewed or downloaded. You cannot recover it later. However, you can create a new access key any time.

Step 1: Access key best practices & alternatives
Step 2: optional: Set description tag
Step 3: Retrieve access keys

Retrieve access keys [info](#)

Access key
If you lose or forget your secret access key, you cannot retrieve it. Instead, create a new access key and make the old key inactive.

Access key Copied | Secret access key

AKIA5G2VGLPFB4XTQV5I | **Show**

Access key best practices

- Never store your access key in plain text, in a code repository, or in code.
- Disable or delete access key when no longer needed.
- Enable least-privilege permissions.
- Rotate access keys regularly.

For more details about managing access keys, see the [best practices for managing AWS access keys](#).

[Download .csv file](#) [Done](#)

■ Access key

ed, or masked and hidden.

ed tags.

reference to another variable.

Environments

are no variables yet.

Group

are no variables yet.

sing it with an API call. The token impersonates

Add variable



Type

Variable (default)



Environments [?](#)

All (default)



Visibility

- ☒ Visible
Can be seen in job logs.
- ☐ Masked
Masked in job logs but value can be revealed in CI/CD settings. Requires values to meet regular expressions requirements.
- ☐ Masked and hidden
Masked in job logs, and can never be revealed in the CI/CD settings after the variable is saved.

Flags [?](#)

- ☒ 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 another variable.

Description (optional)

- ☐ Masked and hidden
Masked in job logs, and can never be revealed in the CI/CD settings after the variable is saved.

Flags [?](#)

- ☒ 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 another variable.

Description (optional)

The description of the variable's value or usage.

Key

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

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

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

Add variable

Cancel

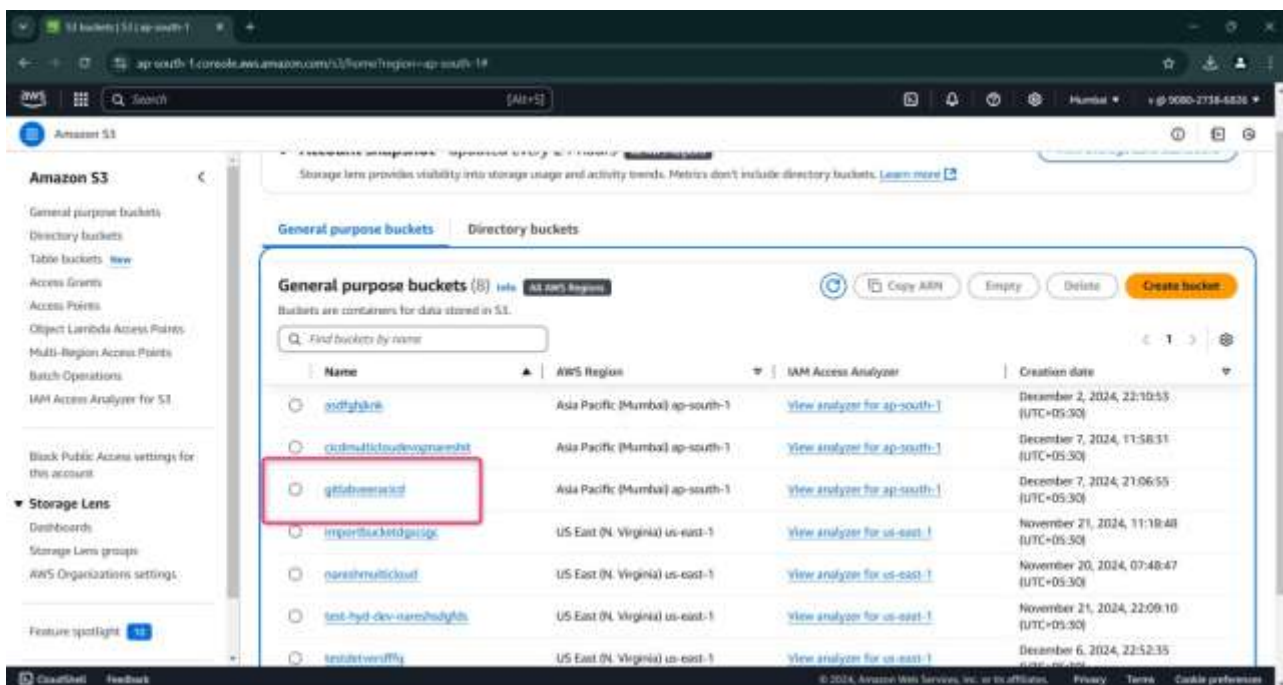
■ Added variables

- **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.
 - **Expanded:** Variables with \$ will be treated as the start of a reference to another variable.

CI/CD Variables </> 2		Reveal values	Add variable
Key ↑	Value	Environments	Actions
MY_AWS_ACCESS_KEY_ID	*****	All (default)	
Protected Expanded			
MY_AWS_SECRET_ACCESS_KEY_ID	*****	All (default)	
Protected Expanded			

Group variables (inherited)

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



THANK YOU