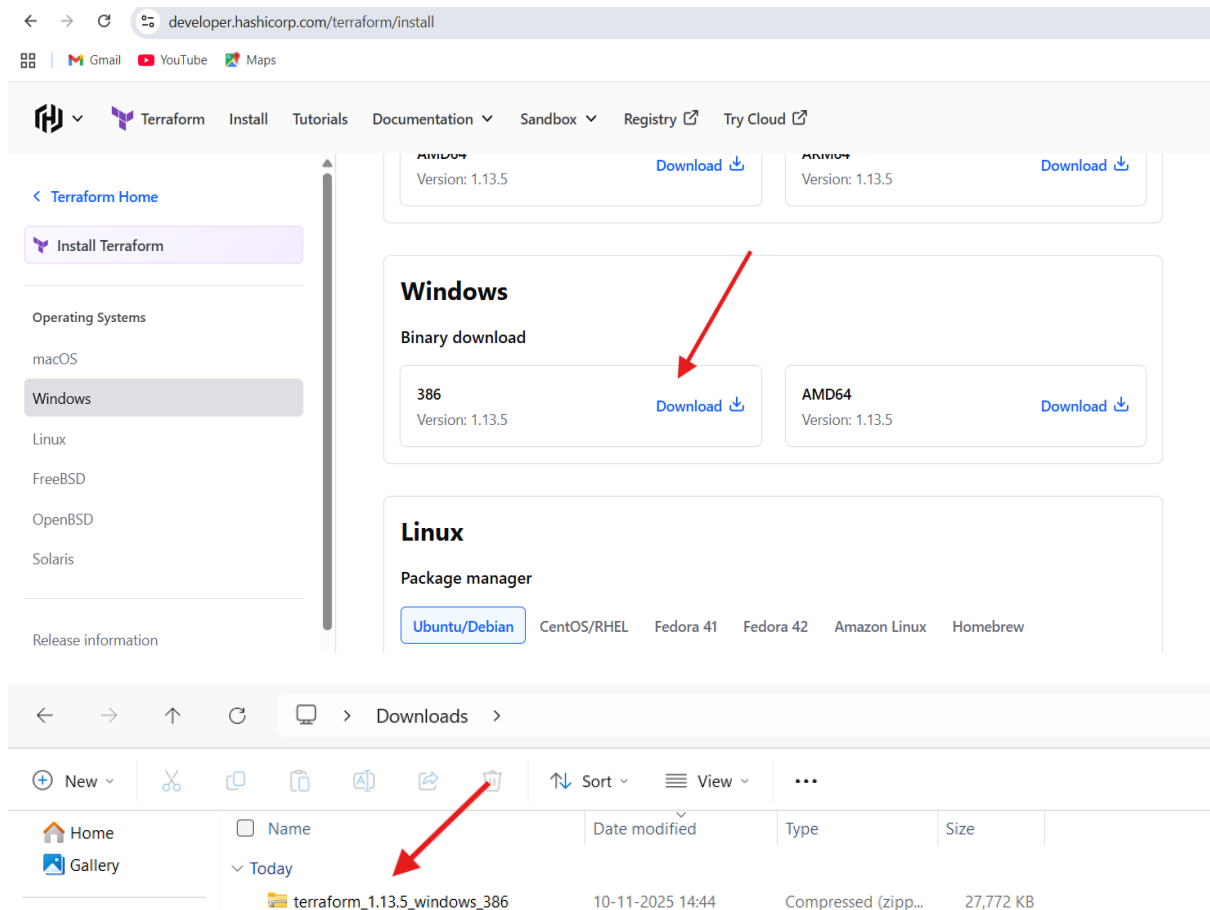
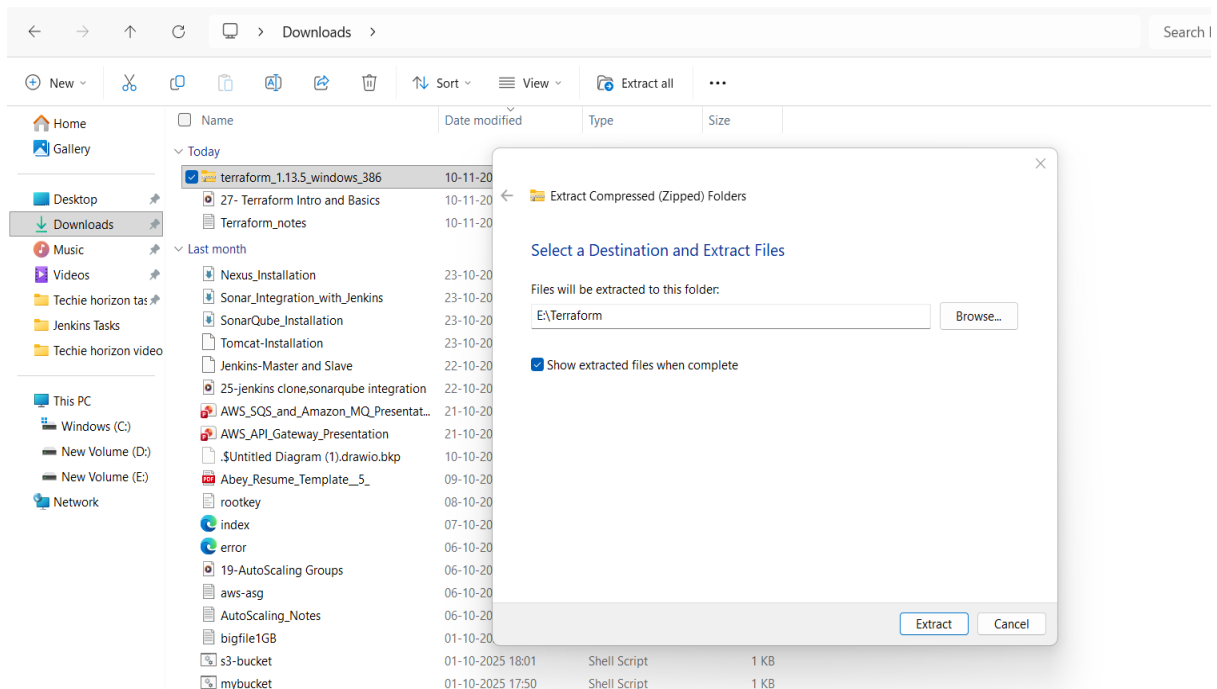


1. Install Terraform on your PC

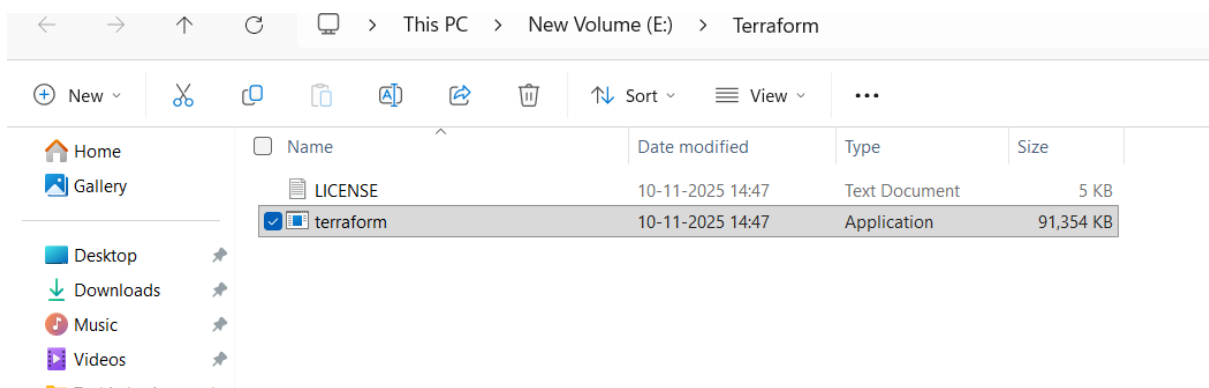
Go to browser search as terraform download for windows and check for windows option and click on download.



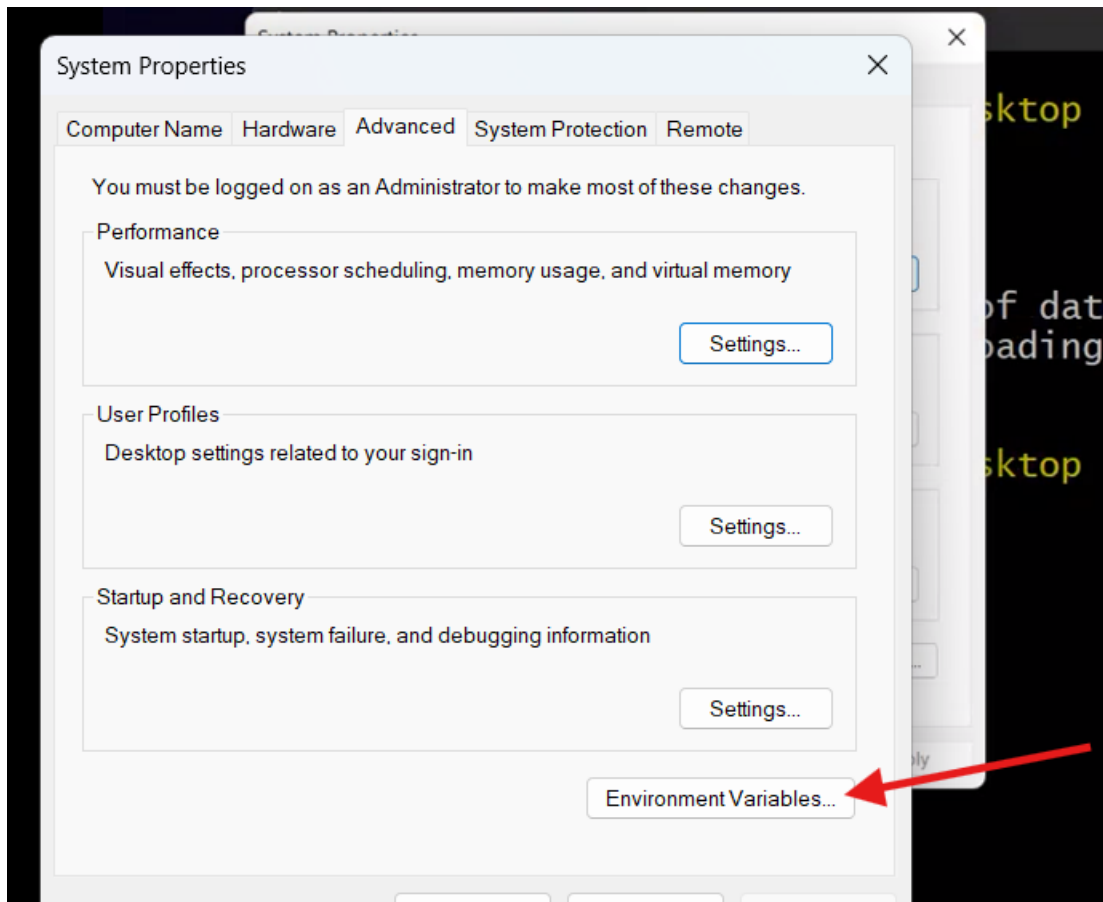
Give a right click on that select extract all and give your location.



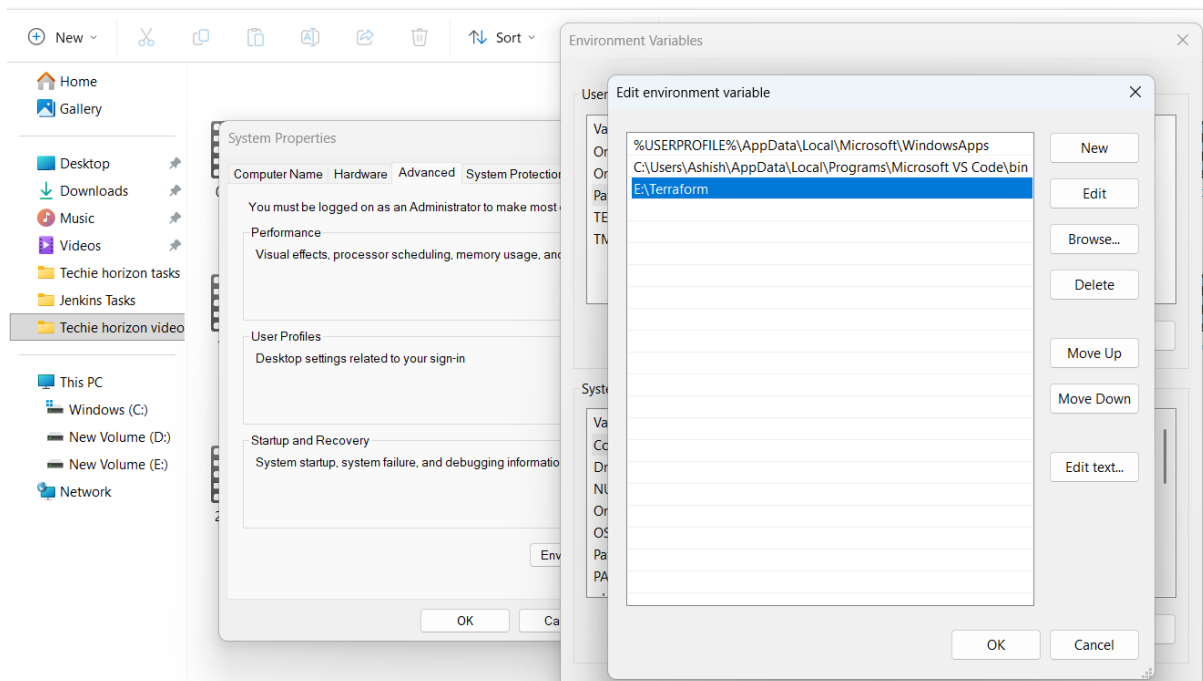
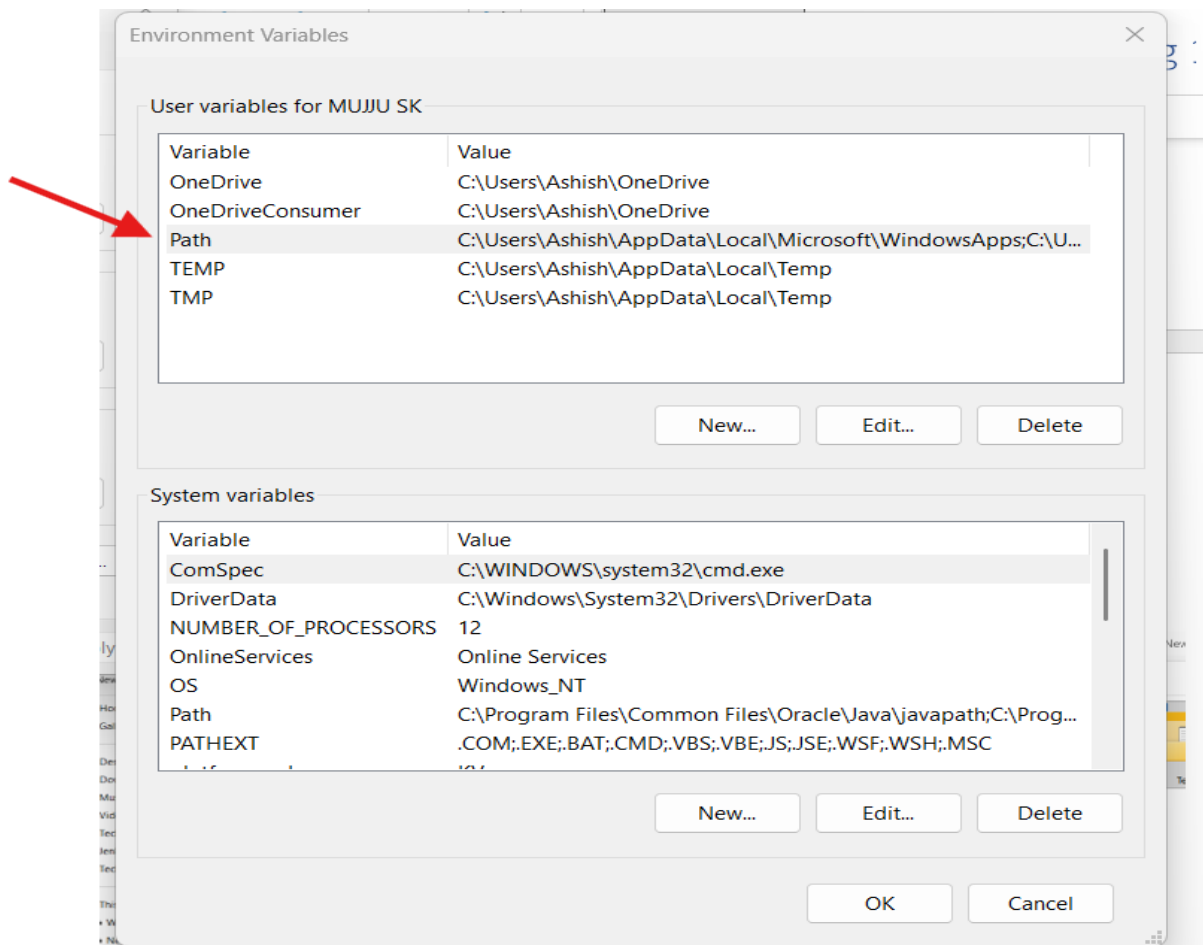
You will see an exe file.



- Search in your pc as system variables select environmental variables.



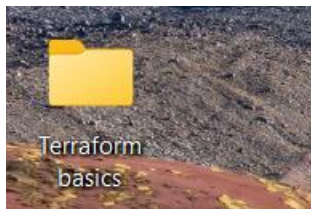
- In that first table click on path and click on edit give your extracted directory path and click on save.



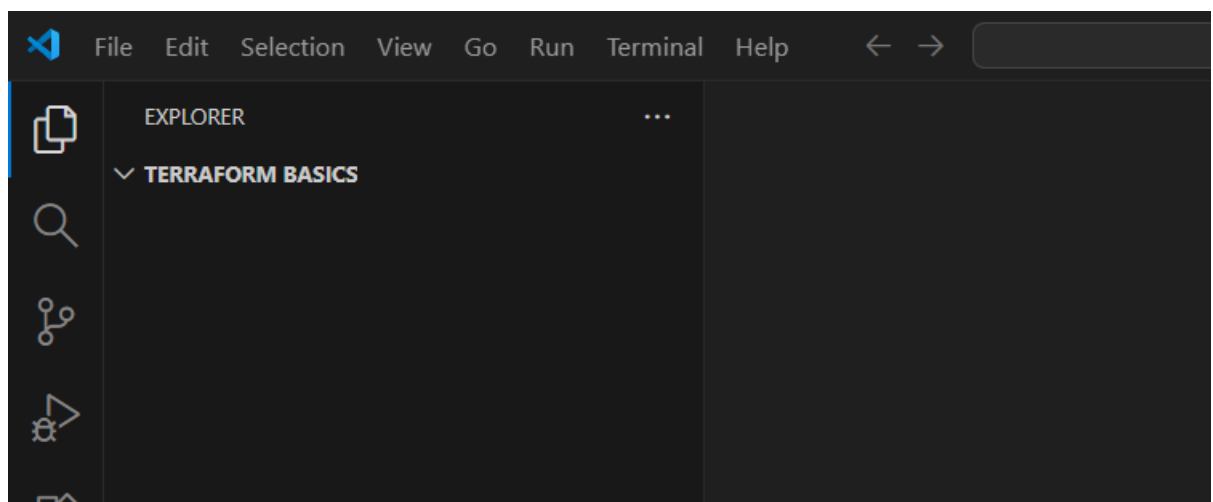
Check the version.

```
MUJJU SK@DESKTOP-LU541U4 MINGW64 ~  
$ terraform -v  
Terraform v1.13.5  
on windows_386  
  
MUJJU SK@DESKTOP-LU541U4 MINGW64 ~  
$
```

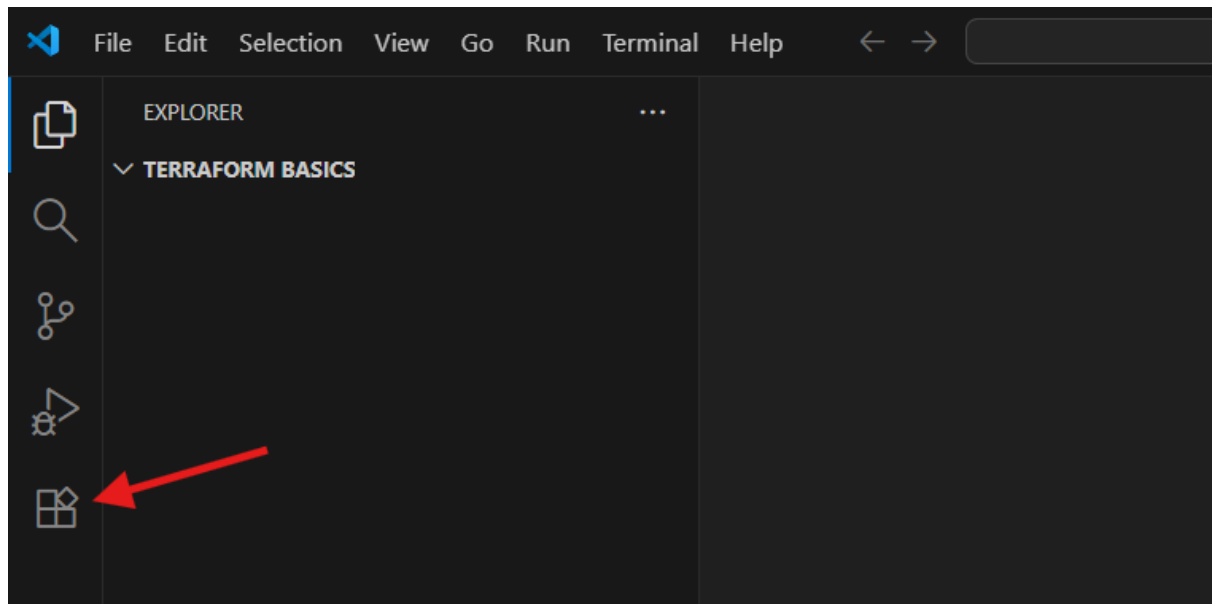
- Create a folder in the desktop as terraform basics.



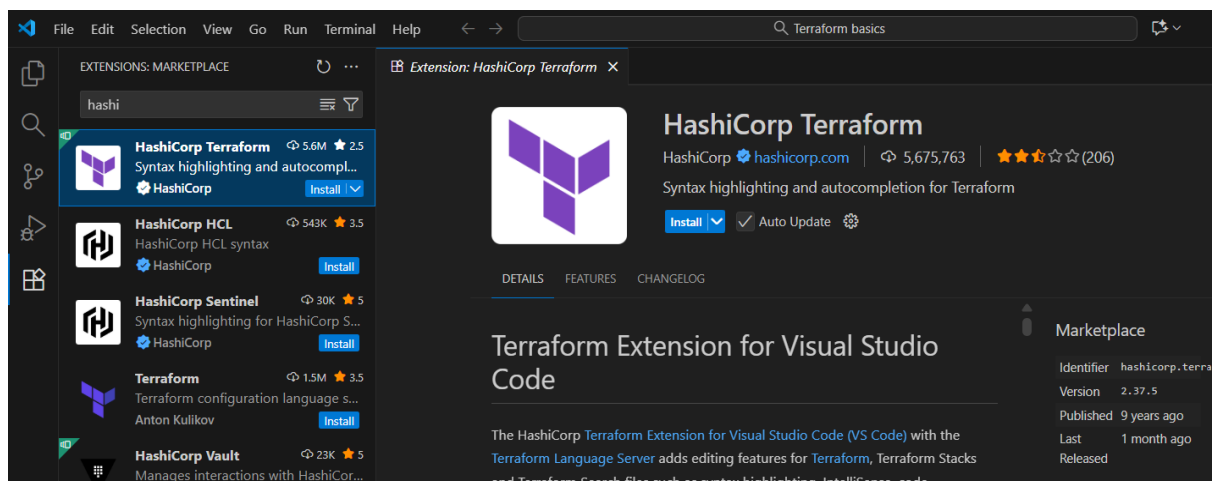
Open visual studio app and click on file, click on open folder and select that you created as terraform baics in desktop.



Click on extensions.

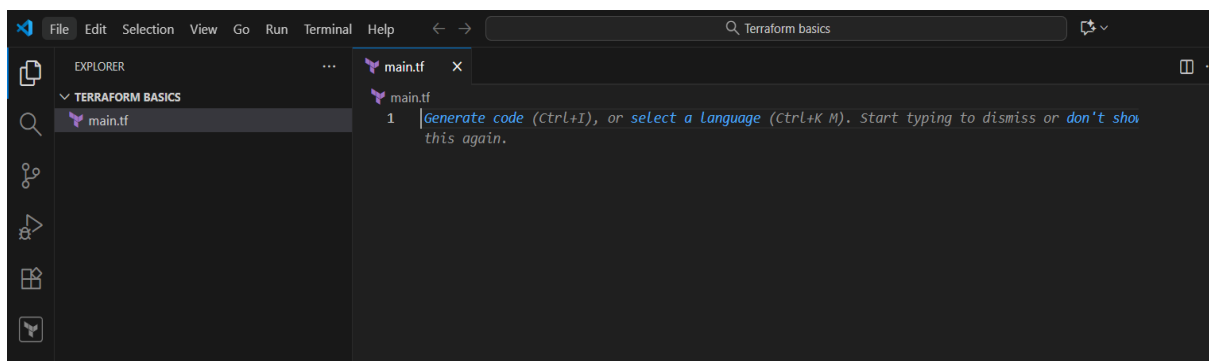
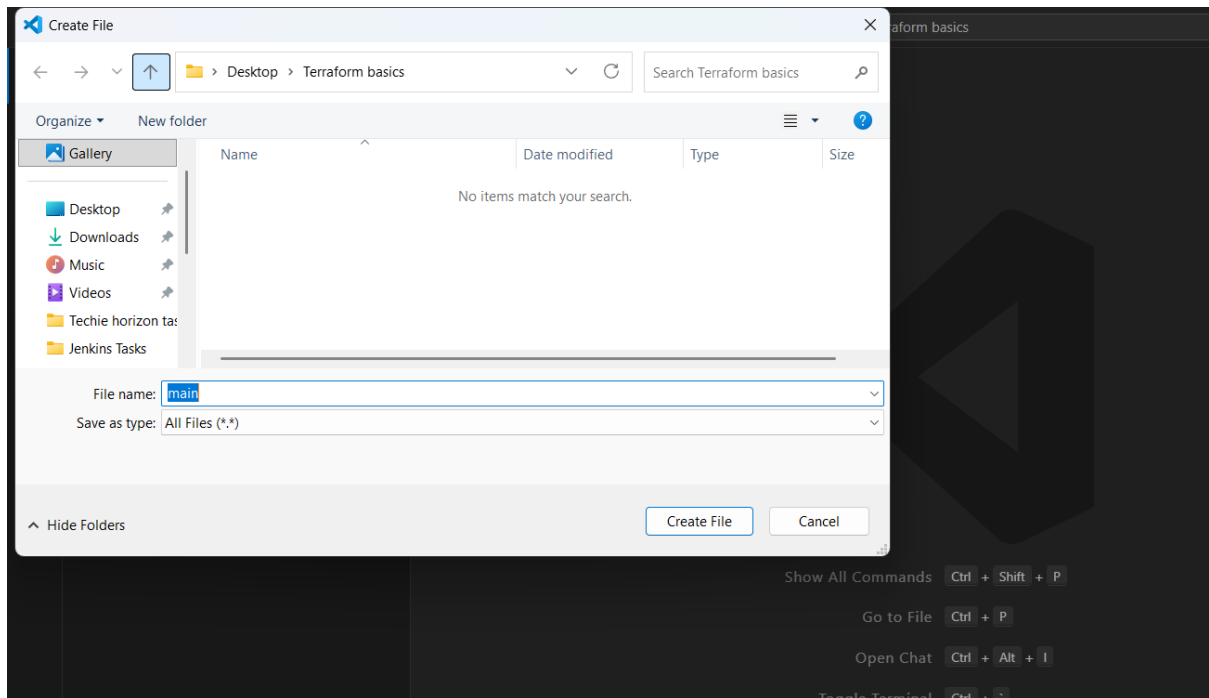


Search in vs studio as hashocrop terraform and install that plugin.



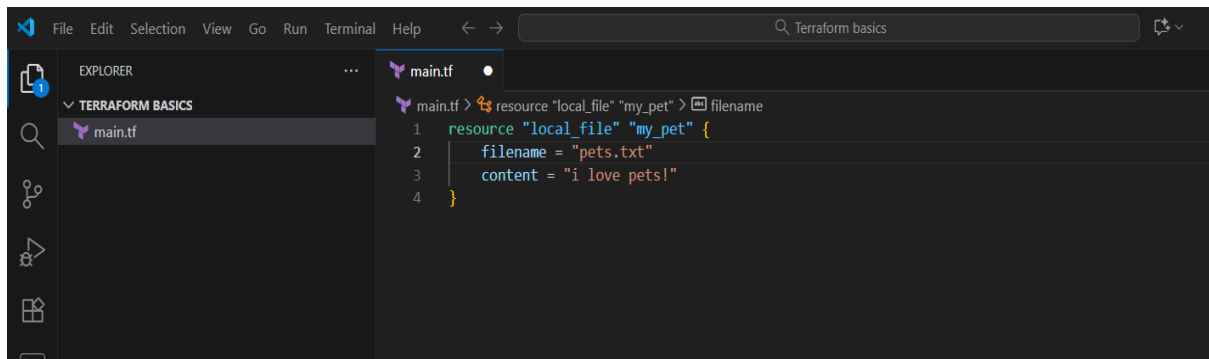
2. Execute all the templates shown in video.

Click on add new file and name it as main.tf and save it in the terraformbasics folder.

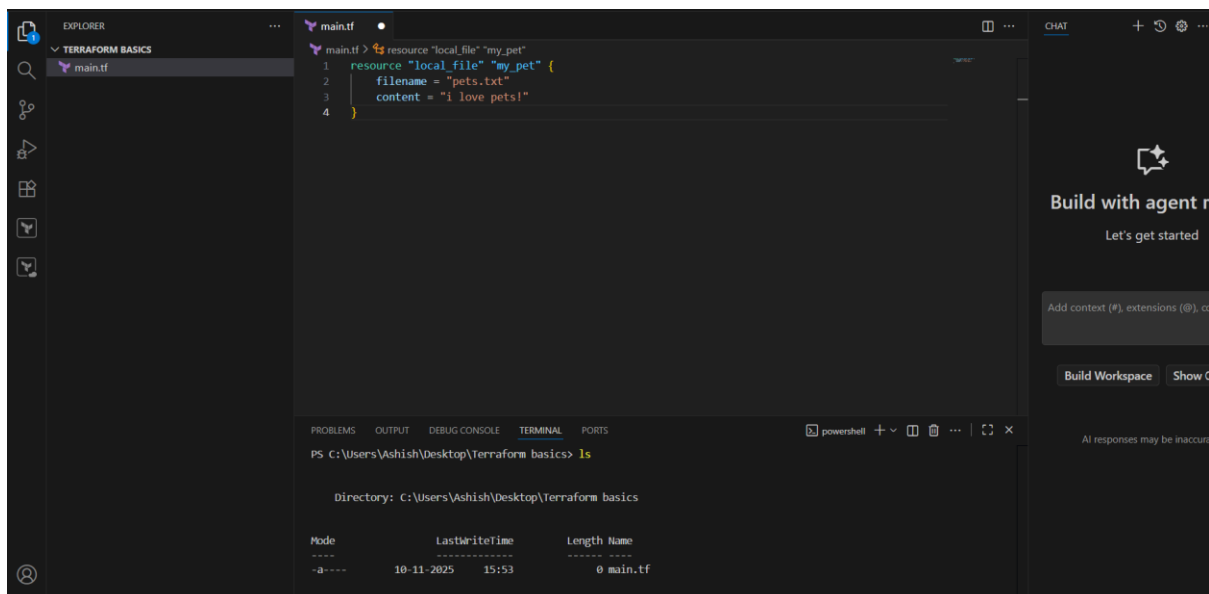
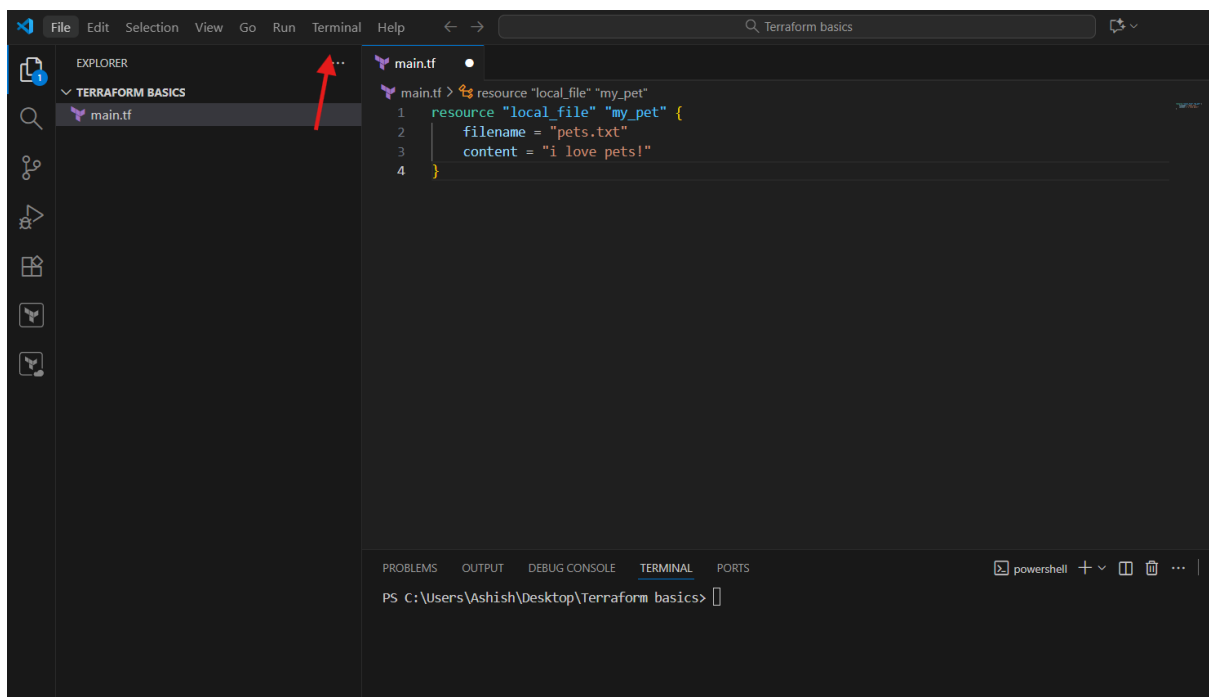


Give this code.

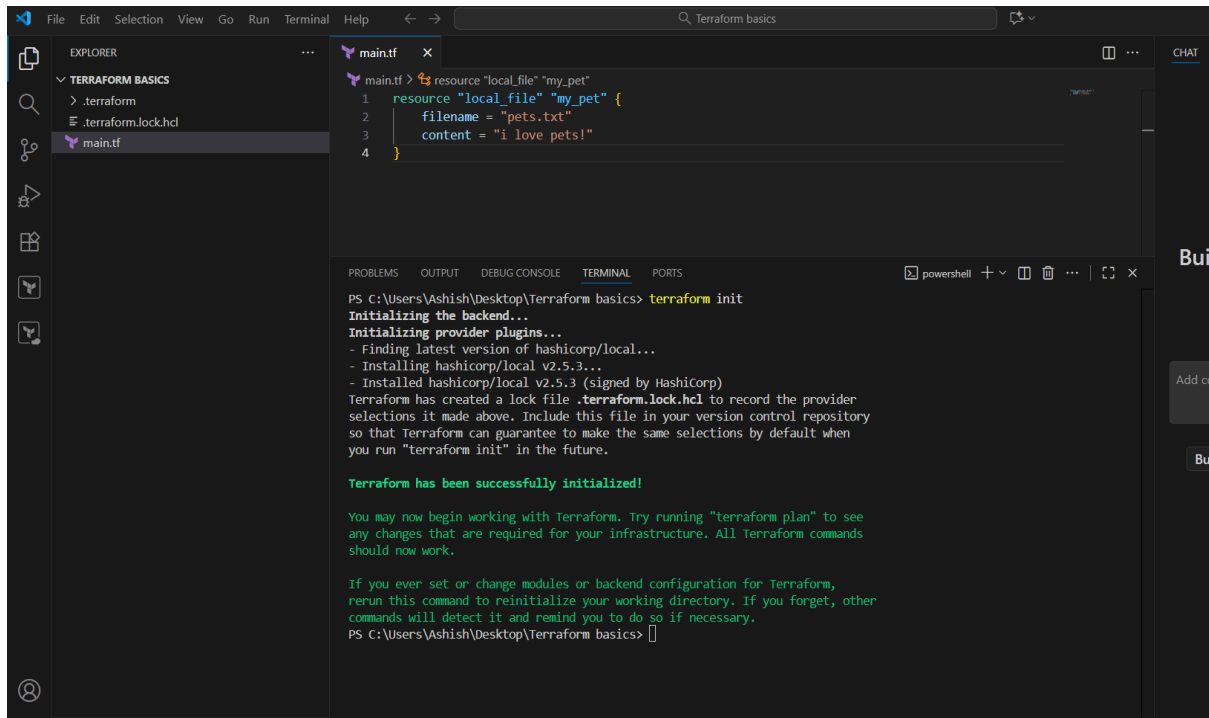
```
resource "local_file" "my_pet" {  
    filename = "pets.txt"  
    content = "i love pets!"  
}
```



To execute this code click on terminal and select new terminal.



- terraform init



```
main.tf
1 resource "local_file" "my_pet"
2   {
3     filename = "pets.txt"
4     content  = "i love pets!"
5   }
6 }
```

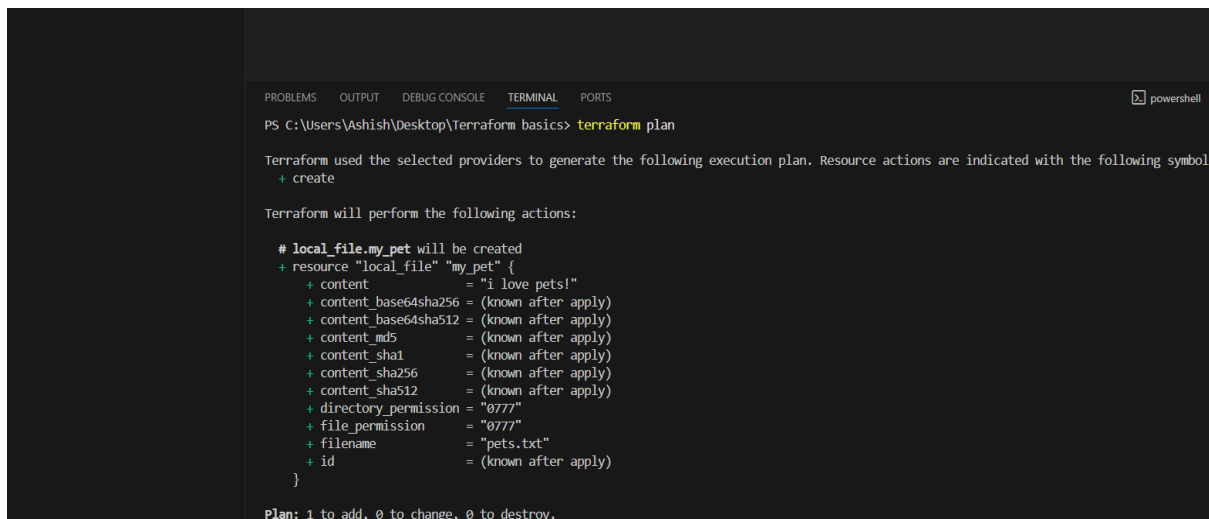
```
PS C:\Users\Ashish\Desktop\Terraform basics> terraform init
Initializing the backend...
Initializing provider plugins...
- Finding latest version of hashicorp/local...
- Installing hashicorp/local v2.5.3...
- Installed hashicorp/local v2.5.3 (signed by HashiCorp)
Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
PS C:\Users\Ashish\Desktop\Terraform basics>
```

- terraform plan



```
PS C:\Users\Ashish\Desktop\Terraform basics> terraform plan

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# local_file.my_pet will be created
+ resource "local_file" "my_pet" {
  + content          = "i love pets!"
  + content_base64sha256 = (known after apply)
  + content_base64sha512 = (known after apply)
  + content_md5       = (known after apply)
  + content_sha1       = (known after apply)
  + content_sha256     = (known after apply)
  + content_sha512     = (known after apply)
  + directory_permission = "0777"
  + file_permission    = "0777"
  + filename           = "pets.txt"
  + id                 = (known after apply)
}

Plan: 1 to add, 0 to change, 0 to destroy.
```

- terraform apply

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

# local_file.my_pet will be created
+ resource "local_file" "my_pet" {
  + content                = "i love pets!"
  + content_base64sha256   = (known after apply)
  + content_base64sha512   = (known after apply)
  + content_md5            = (known after apply)
  + content_sha1          = (known after apply)
  + content_sha256         = (known after apply)
  + content_sha512        = (known after apply)
  + directory_permission   = "0777"
  + file_permission        = "0777"
  + filename               = "pets.txt"
  + id                    = (known after apply)
}

Plan: 1 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

local_file.my_pet: Creating...
local_file.my_pet: Creation complete after 0s [id=6915bac2a8e7b1dc89d1a8fb4a51409cb4bcb4ac]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
PS C:\Users\Ashish\Desktop\Terraform basics>
```

If I change the content love to hate.

```
main.tf
main.tf > resource "local_file" "my_pet" > content
1 resource "local_file" "my_pet" {
2   filename = "pets.txt"
3   content = "i hate pets!"
4 }
```

- terraform plan

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS powershell
PS C:\Users\Ashish\Desktop\Terraform basics> terraform plan
local_file.my_pet: Refreshing state... [id=6915bac2a8e7b1dc89d1a8fb4a51409cb4bcb4ac]

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
-/+ destroy and then create replacement

Terraform will perform the following actions:

# local_file.my_pet must be replaced
-/+ resource "local_file" "my_pet" {
  ~ content      = "i love pets!" -> "i hate pets!" # forces replacement
  ~ content_base64sha256 = "BCHQK9YJEtBR065rP0q+VNXZ8ZTRxoK+LTxcVH/KzTY=" -> (known after apply)
  ~ content_base64sha512 = "x//sAXw7xM56+SG5sqgCr2bL/EHMXWG/UxTZICohBk7dtcLtdpV7LFVxwL8o94NXWpbhrlzawC5+mxuOrbkZhw==" -> (known after apply)
  ~ content_md5      = "336f960d34073778ab954f8fcb5b64b9" -> (known after apply)
  ~ content_sha1      = "6915bac2a8e7b1dc89d1a8fb4a51409cb4bcb4ac" -> (known after apply)
  ~ content_sha256     = "0421d02bd60912d6d13bae6b3ceabe54d5d9f194d1c682be2d3c5c547fcaced6" -> (known after apply)
  ~ content_sha512     = "c7ffec017c3bc4ce7af921b9b2a802af66cbfc41cc5d61bf5314d9202a21064eddb5c2ed76957b2c5571c25f28f783575a96e1ae5cdac0" -> (known after apply)
  ~ id              = "6915bac2a8e7b1dc89d1a8fb4a51409cb4bcb4ac" -> (known after apply)
  # (3 unchanged attributes hidden)
}

Plan: 1 to add, 0 to change, 1 to destroy.
```

- terraform apply

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
-/+ resource "local_file" "my_pet" {
  ~ content      = "i love pets!" -> "i hate pets!" # forces replacement
  ~ content_base64sha256 = "BCHQK9YJEtBR065rP0q+VNXZ8ZTRxoK+LTxcVH/KzTY=" -> (known after apply)
  ~ content_base64sha512 = "x//sAXw7xM56+SG5sqgCr2bL/EHMXWG/UxTZICohBk7dtcLtdpV7LFVxwL8o94NXWpbhrlzawC5+mxuOrbkZhw==" -> (known after apply)
  ~ content_md5      = "336f960d34073778ab954f8fcb5b64b9" -> (known after apply)
  ~ content_sha1      = "6915bac2a8e7b1dc89d1a8fb4a51409cb4bcb4ac" -> (known after apply)
  ~ content_sha256     = "0421d02bd60912d6d13bae6b3ceabe54d5d9f194d1c682be2d3c5c547fcaced6" -> (known after apply)
  ~ content_sha512     = "c7ffec017c3bc4ce7af921b9b2a802af66cbfc41cc5d61bf5314d9202a21064eddb5c2ed76957b2c5571c25f28f783575a96e1ae5cdac0" -> (known after apply)
  ~ id              = "6915bac2a8e7b1dc89d1a8fb4a51409cb4bcb4ac" -> (known after apply)
  # (3 unchanged attributes hidden)
}

Plan: 1 to add, 0 to change, 1 to destroy.

Do you want to perform these actions?
Terraform will perform the actions described above.
Only 'yes' will be accepted to approve.

Enter a value: yes

local_file.my_pet: Destroying... [id=6915bac2a8e7b1dc89d1a8fb4a51409cb4bcb4ac]
local_file.my_pet: Destruction complete after 0s
local_file.my_pet: Creating...
local_file.my_pet: Creation complete after 0s [id=148b9b1012deaf7e6c345dd6c814fb2dec687bb8]

Apply complete! Resources: 1 added, 0 changed, 1 destroyed.
PS C:\Users\Ashish\Desktop\Terraform basics>
```

- terraform destroy

it will delete the pets.txt file.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

- resource "local_file" "my_pet" {
  - content          = "i hate pets!" -> null
  - content_base64sha256 = "tewxqf790wnwxye1hgPXpEUC0ClhZ15U9ICPR2LZDbc=" -> null
  - content_base64sha512 = "8fy+ONqvkh7JXsDgsX4B6nS4lVbXr57SMAKI9Lbh/giQLVa56XNttoA3SKvy/+x5rI1rnu4EbvWyUGlIm8
  - content_md5        = "d1dbf3d232df4eb76903009ebcc80ebe" -> null
  - content_sha1       = "148b9b1012deaf7e6c345dd6c814fb2dec687bb8" -> null
  - content_sha256     = "b5ec31a9fefdd169f05f27b58603d7a44502d02961675e54f4808f4762d90db7" -> null
  - content_sha512     = "f1fcbe38daaf907ec95ec0e0b17e01ea74b89556d7af9ed2300288f4b6e1fe08902d56b9e9736db68
" -> null
  - directory_permission = "0777" -> null
  - file_permission      = "0777" -> null
  - filename             = "pets.txt" -> null
  - id                   = "148b9b1012deaf7e6c345dd6c814fb2dec687bb8" -> null
}

Plan: 0 to add, 0 to change, 1 to destroy.

Do you really want to destroy all resources?
Terraform will destroy all your managed infrastructure, as shown above.
There is no undo. Only 'yes' will be accepted to confirm.

Enter a value: yes

local_file.my_pet: Destroying... [id=148b9b1012deaf7e6c345dd6c814fb2dec687bb8]
local_file.my_pet: Destruction complete after 0s

Destroy complete! Resources: 1 destroyed.
PS C:\Users\Ashish\Desktop\Terraform basics>
```

Add random.pet file to the code

```
main.tf X
main.tf > resource "random_pet" "my_pet" > length
1 resource "local_file" "my_pet" {
2   filename = "pets.txt"
3   content = "i hate pets!"
4 }
5 resource "random_pet" "my_pet" {
6   prefix = "MR"
7   separator = "."
8   length = "1"
9 }

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\Ashish\Desktop\Terraform basics> terraform apply

Error: Inconsistent dependency lock file

The following dependency selections recorded in the lock file are inconsistent with the current configuration:
- provider registry.terraform.io/hashicorp/random: required by this configuration but no version is set

To update the locked dependency selections to match a changed configuration, run:
  terraform init -upgrade

PS C:\Users\Ashish\Desktop\Terraform basics>
```

This time error found then we need to do terraform init and terraform add.

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
+ resource "local_file" "my_pet" {
  + content          = "i hate pets!"
  + content_base64sha256 = (known after apply)
  + content_base64sha512 = (known after apply)
  + content_md5       = (known after apply)
  + content_sha1      = (known after apply)
  + content_sha256    = (known after apply)
  + content_sha512    = (known after apply)
  + directory_permission = "0777"
  + file_permission   = "0777"
  + filename          = "pets.txt"
  + id                = (known after apply)
}
```

random_pet.my_pet will be created

```
+ resource "random_pet" "my_pet" {
  + id          = (known after apply)
  + length      = 1
  + prefix      = "MR"
  + separator   = "."
}
```

Plan: 2 to add, 0 to change, 0 to destroy.

Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to
PS C:\Users\Ashish\Desktop\Terraform basics> |

```
+ file_permission = "0777"
+ filename        = "pets.txt"
+ id              = (known after apply)
}

# random_pet.my_pet will be created
+ resource "random_pet" "my_pet" {
+   id          = (known after apply)
+   length      = 1
+   prefix      = "MR"
+   separator    = "."
+ }

Plan: 2 to add, 0 to change, 0 to destroy.

Do you want to perform these actions?
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

Enter a value: yes

random_pet.my_pet: Creating...
random_pet.my_pet: Creation complete after 0s [id=MR.bobcat]
local_file.my_pet: Creating...
local_file.my_pet: Creation complete after 0s [id=148b9b1012deaf7e6c345dd6c814fb2dec687bb8]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.
PS C:\Users\Ashish\Desktop\Terraform basics>
```

3. Note down below points Terraform Init ,Terraform Plan, Terraform Apply, Terraform Provider.

Terraform init:

The command **terraform init** is used to **initialize** a Terraform working directory before you can use Terraform commands like plan, apply, or destroy.

- It prepares your folder (with .tf files) so Terraform knows how to run there.

Terraform plan:

The command **terraform plan** is used to **preview** what Terraform will do before actually making any changes to your infrastructure.

- Which **resources will be created**
- Which **will be modified**
- Which **will be destroyed**
- Any **errors or conflicts** before applying

Terraform apply:

The command **terraform apply** is used to **create or modify real infrastructure** as defined in your Terraform configuration files (.tf).

- **Builds** new infrastructure
- **Updates** existing infrastructure
- **Destroys** resources that are no longer in your config
- Saves the new **state** to your backend.

Terraform provider:

The **terraform provider** concept refers to the **plugins** that Terraform uses to interact with different **clouds, services, and APIs** — such as AWS, Azure, Google Cloud, Kubernetes, GitHub, etc.

How terraform uses providers:

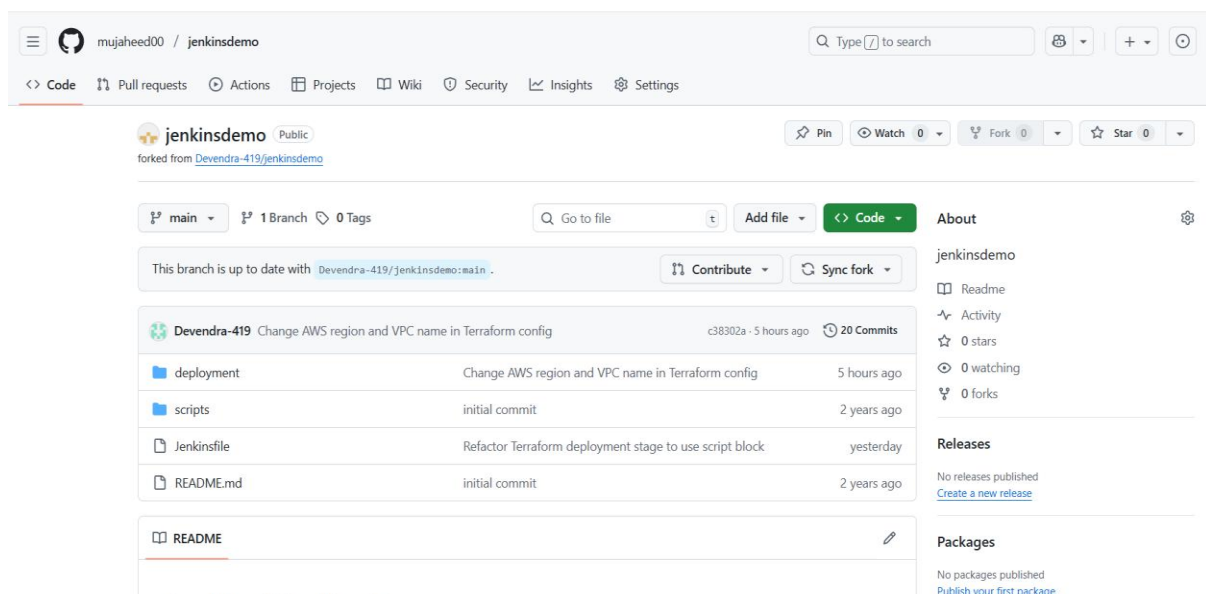
1. You define a provider in your .tf files.
2. terraform init downloads the necessary provider binaries into .terraform/providers/.

3. terraform plan and terraform apply use that provider to communicate with the cloud API.

4. Integrate a sample Terraform template in Jenkins.

Create a repository in github and add necessary documents into that like jenkinsfile,main.tf.

<https://github.com/mujaheed00/jenkinsdemo.git>



Git clone in Jenkins server

```
[root@ip-172-31-100-181 ~]# git clone https://github.com/mujaheed00/terraform-basics.git
Cloning into 'terraform-basics'...
remote: Enumerating objects: 40, done.
remote: Counting objects: 100% (40/40), done.
remote: Compressing objects: 100% (31/31), done.
remote: Total 40 (delta 12), reused 29 (delta 6), pack-reused 0 (from 0)
Receiving objects: 100% (40/40), 6.08 KiB | 6.08 MiB/s, done.
Resolving deltas: 100% (12/12), done.
[root@ip-172-31-100-181 ~]# ls
terraform-basics
[root@ip-172-31-100-181 ~]# cd terraform-basics/
[root@ip-172-31-100-181 terraform-basics]# ls
Jenkinsfile  README.md  deployment  scripts
[root@ip-172-31-100-181 terraform-basics]#
```

Create an IAM role

aws [Search] [Alt+S]

IAM > Roles > Create role

Step 1: Select trusted entity (selected)
Step 2: Add permissions
Step 3: Name, review, and create

Select trusted entity [Info](#)

Trusted entity type

- ☒ **AWS service**
Allow AWS services like EC2, Lambda, or others to perform actions in this account.
- ☐ **AWS account**
Allow entities in other AWS accounts belonging to you or a 3rd party to perform actions in this account.
- ☐ **Web identity**
Allows users federated by the specified external web identity provider to assume this role to perform actions in this account.
- ☐ **SAML 2.0 federation**
Allow users federated with SAML 2.0 from a corporate directory to perform actions in this account.
- ☐ **Custom trust policy**
Create a custom trust policy to enable others to perform actions in this account.

Use case
Allow an AWS service like EC2, Lambda, or others to perform actions in this account.

Service or use case
EC2

Choose a use case for the specified service.

Select administrator access and save.

IAM > Roles > Create role

Step 1: Select trusted entity
Step 2: Add permissions (selected)
Step 3: Name, review, and create

Add permissions [Info](#)

Permissions policies (1/1084) [Info](#)

Choose one or more policies to attach to your new role.

Search: [] Filter by Type: All types

<input type="checkbox"/>	Policy name ↗	Type	Description
<input checked="" type="checkbox"/>	AdministratorAccess	AWS managed - job function	Provides full access to AWS services an...
<input type="checkbox"/>	AdministratorAccess-Amplify	AWS managed	Grants account administrative permissi...
<input type="checkbox"/>	AdministratorAccess-AWSElasticBeanstalk	AWS managed	Grants account administrative permissi...
<input type="checkbox"/>	AIOpsAssistantIncidentReportPolicy	AWS managed	Provides permissions required by the A...
<input type="checkbox"/>	AIOpsAssistantPolicy	AWS managed	Provides ReadOnly permissions requir...
<input type="checkbox"/>	AIOpsConsoleAdminPolicy	AWS managed	Grants full access to Amazon AI Opera...

Give name as jenkinsadmin and click on create role.

aws

[Alt+S]

Search

IAM > Roles > Create role

Step 1
Select trusted entity

Step 2
Add permissions

Step 3
Name, review, and create

Name, review, and create

Role details

Role name

Enter a meaningful name to identify this role.

jenkinsadmin

Maximum 64 characters. Use alphanumeric and '+=,@-_' characters.

Description

Add a short explanation for this role.

Allows EC2 instances to call AWS services on your behalf.

Maximum 1000 characters. Use letters (A-Z and a-z), numbers (0-9), tabs, new lines, or any of the following characters: _+=, @-/\[\]\{\}\#\%\^*\~\`;\`\`\``

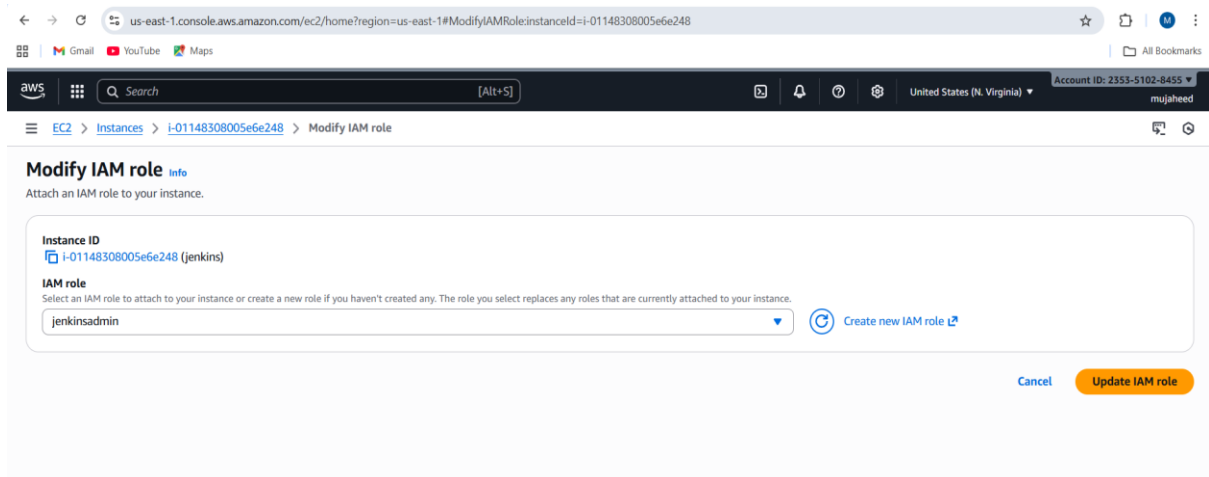
Trust policy

```
1 {  
2   "Version": "2012-10-17",  
3   "Statement": [  

```

Go to your Jenkins ec2 instance and click on actions, click on security, click on modify IAM role.

Select your created IAM role.



```
main.tf variable.tf
[root@ip-172-31-77-84 deployment]# cat main.tf
provider "aws" {
  region = "us-east-1"
}

data "aws_vpc" "selected" {
  filter {
    name   = "tag:Name"
    values = ["default"]
  }
}

data "aws_subnets" "selected" {
  filter {
    name   = "vpc-id"
    values = [data.aws_vpc.selected.id]
  }
}


data "aws_ami" "amazon_linux_2" {
  most_recent = true
  filter {
    name   = "name"
    values = ["amzn2-ami-hvm-*-x86_64-gp2"]
  }

  filter {
    name   = "virtualization-type"
    values = ["hvm"]
  }
}
```

Create a item with name terraform-pipeline and select pipeline as type.

← → ↻ Not secure 98.92.0.72:8080/newJob

📦 Gmail YouTube Maps


 **Jenkins** / New Item


New Item


Enter an item name


Terraform-pipeline

Select an item type

 **Freestyle project**
Classic, general-purpose job type that checks out from up to one SCM, executes build steps serially, followed by post-build steps like archiving artifacts and sending email notifications.

 **Pipeline**
Orchestrates long-running activities that can span multiple build agents. Suitable for building pipelines (formerly known as workflows) and/or organizing complex activities that do not easily fit in free-style job type.

 **Multi-configuration project**
Suitable for projects that need a large number of different configurations, such as testing on multiple environments, platform-specific builds, etc.


 **Folder**
Creates a container that stores nested items in it. Useful for grouping things together. Unlike view, which is just a filter, a folder creates a separate namespace, so you can have multiple things of the same name as long as they are in different folders.

OK


Select as pipeline script from SCM and select git option enter your repo url and branch as main.


← → ↻ Not secure 98.92.0.72:8080/job/Terraform-pipeline/configure


📦 Gmail YouTube Maps


 **Jenkins** / Terraform-pipeline ▾ / Configuration

Configure

 General

 Triggers

 **Pipeline**

 Advanced

Define your Pipeline using Groovy directly or pull it from source control.

Definition

Pipeline script from SCM ▾

SCM ?

Git ▾

Repositories ?

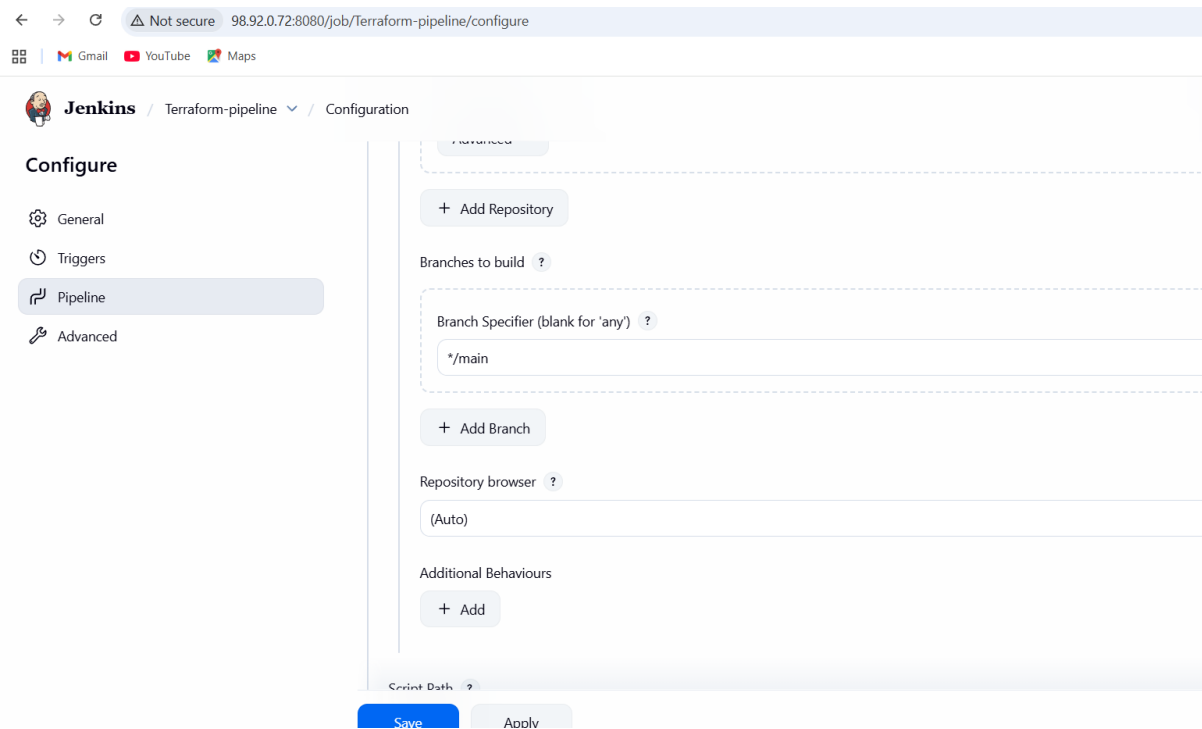
Repository URL ? ✕

https://github.com/mujaheed00/jenkinsdemo.git

Credentials ?

- none - ▾ + Add

Advanced ▾



To to your cloned repository and edit sudoers file

- `vi /etc/sudoers`

```
root@ip-172-31-100-181 terraform-basics]# vi /etc/sudoers
oot@ip-172-31-100-181 terraform-basics]#
```

Type this line.

```
#
# Adding HOME to env_keep may enable a user to run unrestricted
# commands via sudo.
#
# Defaults    env_keep += "HOME"
Defaults     secure_path = /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/var/

## Next comes the main part: which users can run what software on
## which machines (the sudoers file can be shared between multiple
## systems).
## Syntax:
##
##      user    MACHINE=COMMANDS
##
## The COMMANDS section may have other options added to it.
##
## Allow root to run any commands anywhere
root    ALL=(ALL)        ALL
jenkins ALL=(ALL) NOPASSWD:ALL
## Allows members of the 'sys' group to run networking, software,
## service management apps and more.
# %sys ALL = NETWORKING, SOFTWARE, SERVICES, STORAGE, DELEGATING, PROCESSES, LOCATE, DRIVERS

## Allows people in group wheel to run all commands
%wheel  ALL=(ALL)        ALL

## Same thing without a password
# %wheel    ALL=(ALL)        NOPASSWD: ALL

## Allows members of the users group to mount and unmount the
## cdrom as root
# %users    ALL=/sbin/mount /mnt/cdrom, /sbin/umount /mnt/cdrom

## Allows members of the users group to shutdown this system
# %users    localhost=/sbin/shutdown -h now

## Read drop-in files from /etc/sudoers.d (the # here does not mean a comment)
#include_dir /etc/sudoers.d
-- INSERT -- W10: Warning: Changing a readonly file
```

Go to job click on build now

Jenkins / Terraform-pipeline

Build Now

Stage view

	Declarative: Checkout SCM	Checkout Code	Install Terraform	Terraform Deployment
Average stage times: (full run time: ~37s)	251ms	242ms	1s	30s
#2 Nov 12 12:54 No Changes	251ms	242ms	1s	30s
#1 Nov 12 12:51 No Changes				

Builds

Filter

Today

#2 7:24 AM

Permalinks

- Last build (#2), 1 min 52 sec ago
- Last stable build (#2), 1 min 52 sec ago
- Last successful build (#2), 1 min 52 sec ago

It will automatically create an instance with the name terraform.

