Name: Abhinav Swaminathan D15C Roll No: 01

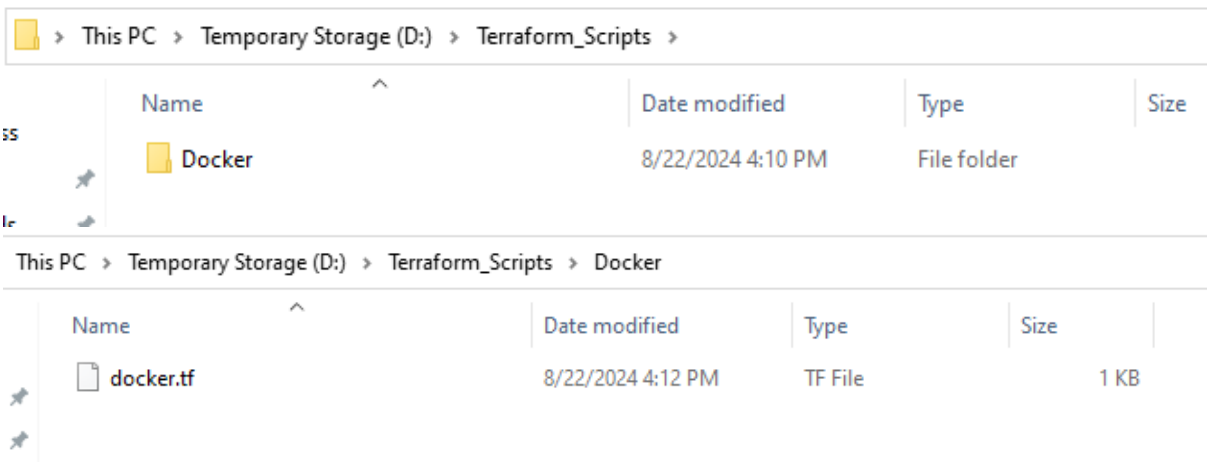
Experiment No. 6

1. Creating a docker image using terraform

```
C:\Users\abhinav>docker --version
Docker version 26.1.3, build b72abbb

C:\Users\abhinav>docker

Usage:  docker [OPTIONS] COMMAND

A self-sufficient runtime for containers

Common Commands:
  run         Create and run a new container from an image
  exec        Execute a command in a running container
  ps          List containers
  build       Build an image from a Dockerfile
  pull        Download an image from a registry
  push        Upload an image to a registry
  images      List images
  login       Log in to a registry
  logout      Log out from a registry
  search      Search Docker Hub for images
  version     Show the Docker version information
  info        Display system-wide information

Management Commands:
  builder     Manage builds
  buildx*     Docker Buildx
  compose*    Docker Compose
  container   Manage containers
  context     Manage contexts
```

2. Create a folder named ‘Terraform Scripts’ in which we save our different types of scripts which will be further used in this experiment.

3. Create a new folder named ‘Docker’ in the ‘TerraformScripts’ folder. Then create a new docker.tf file using a text editor and write the following contents into it to create a Ubuntu Linux container.



docker.tf - Notepad

File Edit Format View Help

```
terraform {
        required_providers {
                docker = {
                source = "kreuzwerker/docker"
                version = "2.21.0"
                }
        }
}
provider "docker" {
host = "npipe:////.//pipe//docker_engine"
}

# Pulls the image
resource "docker_image" "ubuntu" {
        name = "ubuntu:latest"
}

# Create a container
resource "docker_container" "foo" {
        image = docker_image.ubuntu.image_id
        name = "foo"
}
```

4. Execute Terraform Init command to initialize the resources

```
D:\Terraform_Scripts\Docker>terraform init
Initializing the backend...
Initializing provider plugins...
- Finding kreuzwerker/docker versions matching "2.21.0"...
- Installing kreuzwerker/docker v2.21.0...
- Installed kreuzwerker/docker v2.21.0 (self-signed, key ID BD080C4571C6104C)
Partner and community providers are signed by their developers.
If you'd like to know more about provider signing, you can read about it here:
https://www.terraform.io/docs/cli/plugins/signing.html
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.

D:\Terraform_Scripts\Docker>
```

5. Execute Terraform plan to see the available resources

```
D:\Terraform_Scripts\Docker>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:

  # docker_container.foo will be created
  + resource "docker_container" "foo" {
      + attach           = false
      + bridge           = (known after apply)
      + command          = (known after apply)
      + container_logs   = (known after apply)
      + entrypoint       = (known after apply)
      + env              = (known after apply)
      + exit_code        = (known after apply)
      + gateway          = (known after apply)
      + hostname         = (known after apply)
      + id               = (known after apply)
      + image            = (known after apply)
      + init             = (known after apply)
      + ip_address       = (known after apply)
      + ip_prefix_length = (known after apply)
      + ipc_mode         = (known after apply)
      + log_driver       = (known after apply)
      + logs             = false
      + must_run         = true
      + name             = "foo"
      + network_data     = (known after apply)
      + read_only        = false
      + remove_volumes   = true
      + restart          = "no"
      + rm               = false
      + runtime          = (known after apply)
      + security_opts    = (known after apply)
      + shm_size         = (known after apply)
      + start            = true
      + stdin_open       = false
      + stop_signal      = (known after apply)
      + stop_timeout     = (known after apply)
      + tty              = false

      + healthcheck (known after apply)

      + labels (known after apply)
    }

  # docker_image.ubuntu will be created
  + resource "docker_image" "ubuntu" {
      + id          = (known after apply)
      + image_id    = (known after apply)
      + latest      = (known after apply)
      + name        = "ubuntu:latest"
      + output      = (known after apply)
      + repo_digest = (known after apply)
    }

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

6. Execute Terraform apply to apply the configuration, which will automatically create and run the Ubuntu Linux container based on our configuration. Using command : “terraform apply”

```
D:\Terraform_Scripts\Docker>terraform apply

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:

  # docker_container.foo will be created
  + resource "docker_container" "foo" {
      + attach           = false
      + bridge           = (known after apply)
      + command          = (known after apply)
      + container_logs   = (known after apply)
      + entrypoint       = (known after apply)
      + env              = (known after apply)
      + exit_code        = (known after apply)
      + gateway          = (known after apply)
      + hostname         = (known after apply)
      + id               = (known after apply)
      + image            = (known after apply)
      + init             = (known after apply)
      + ip_address       = (known after apply)
      + ip_prefix_length = (known after apply)
      + ipc_mode         = (known after apply)
      + log_driver       = (known after apply)
      + logs             = false
      + must_run         = true
      + name             = "foo"
      + network_data     = (known after apply)
      + read_only        = false
      + remove_volumes   = true
      + restart          = "no"
      + rm               = false
      + runtime          = (known after apply)
      + security_opts    = (known after apply)
      + shm_size         = (known after apply)
      + start            = true
      + stdin_open       = false
      + stop_signal      = (known after apply)
      + stop_timeout     = (known after apply)
      + tty              = false

      + healthcheck (known after apply)

      + labels (known after apply)
    }

  # docker_image.ubuntu will be created
  + resource "docker_image" "ubuntu" {
      + id          = (known after apply)
      + image_id    = (known after apply)
      + latest      = (known after apply)
      + name        = "ubuntu:latest"
      + output      = (known after apply)
      + repo_digest = (known after apply)
    }

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

docker_image.ubuntu: Creating...
docker_image.ubuntu: Still creating... [19s elapsed] docker_image.ubuntu: Still creating... (20s elapsed) docker_image.
ubuntu: Still creating... [30s elapsed]
docker_image.ubuntu: Creation complete after 30s [id=sha256:263966596d42ad38ae9914716692777ba9ff8779a62ad93a74fe82e3e1f
ubuntu:latest] docker_container.foo: Creating...
```

7. Check Docker images, Before and After Executing Apply step

```
D:\Terraform_Scripts\Docker>docker images
REPOSITORY                                  TAG                             IMAGE ID       CREATED       SIZE
mcr.microsoft.com/dotnet/framework/aspnet   4.8-windowsservercore-ltsc2022  0b1ef1176a57   6 weeks ago   5.43GB
mcr.microsoft.com/dotnet/framework/sdk      4.8-windowsservercore-ltsc2022  c3f8c2735565   6 weeks ago   9.04GB
mcr.microsoft.com/dotnet/framework/runtime  4.8-windowsservercore-ltsc2022  e69ea8a5ec1b   6 weeks ago   5.1GB
mcr.microsoft.com/windows/servercore        ltsc2022                        e60f47e635b7   7 weeks ago   4.84GB
mcr.microsoft.com/windows/nanoserver        ltsc2022                        f0ca29645006   7 weeks ago   292MB

D:\Terraform_Scripts\Docker>
```

```
D:\Terraform_Scripts\Docker>docker images
REPOSITORY                                  TAG                             IMAGE ID       CREATED         SIZE
mcr.microsoft.com/dotnet/framework/aspnet   4.8-windowsservercore-ltsc2022  0b1ef1176a57   6 weeks ago     5.43GB
mcr.microsoft.com/dotnet/framework/sdk      4.8-windowsservercore-ltsc2022  c3f8c2735565   6 weeks ago     9.04GB
mcr.microsoft.com/dotnet/framework/runtime  4.8-windowsservercore-ltsc2022  e69ea8a5ec1b   6 weeks ago     5.1GB
mcr.microsoft.com/windows/servercore        ltsc2022                        e60f47e635b7   7 weeks ago     4.84GB
mcr.microsoft.com/windows/nanoserver        ltsc2022                        f0ca29645006   7 weeks ago     292MB
ubuntu                                      Latest                          2dc39ba859dc   2 minutes ago   77.8MB
```

8. Execute Terraform destroy to delete the configuration, which will automatically delete the Ubuntu Container.

```
D:\Terraform_Scripts\Docker>terraform destroy
docker_image.ubuntu: Refreshing state... [idrsha256:2dc29b50dcd2d30101475692777ba087762d92de0221fubuntu:latest)
Terrafore used the selected providers to generate the following execution plan. Resource actions are indicated with the following sy
mbols:
    destroy
Terraform will perform the following actions:

  #  docker_image.ubuntu will be destroyed
       resource "docker_image" "ubuntu" {
           - id           = "sha256:2dc39b859dc2ade8ae30147b5692777ba9ff9779a62ad93a78de82e3elfubuntu:latest" -> null
           - image_id     = "sha256:2dc39b859dc2ade8ae30147b5692777ba9ff9779a62ad93a78de82e3elf" -> null
           - Latest       = "sha256:2dc39b859dc2ade8ae30147b5692777ba9ff9779a62ad93a78de82e3elf" -> null
           - name         = "ubuntu:latest" -> null
           - repo digest  = "ubuntu@sha256:204a3d7bb4d7723452be3923b06cd7043704030041c83c#7856c1" -> null
       }

Plan: to add, 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 so unde. Only 'yes' will be accepted to confirm.

  Enter a value: yes

docker image.ubuntu: Destroying... [id-sha256:2de99b59cd42ade83814765692777ba5ff8779a62ad93ad62e3e1fubuntu:latest]
docker image.ubuntu: Destruction complete after is

Destroy complete! Resources: 1 destroyed.
```

9. Check Docker images, After Executing Destroy step

```
D:\Terraform_Scripts\Docker>docker images
REPOSITORY                                  TAG                             IMAGE ID       CREATED       SIZE
mcr.microsoft.com/dotnet/framework/aspnet   4.8-windowsservercore-ltsc2022  0b1ef1176a57   6 weeks ago   5.43GB
mcr.microsoft.com/dotnet/framework/sdk      4.8-windowsservercore-ltsc2022  c3f8c2735565   6 weeks ago   9.04GB
mcr.microsoft.com/dotnet/framework/runtime  4.8-windowsservercore-ltsc2022  e69ea8a5ec1b   6 weeks ago   5.1GB
mcr.microsoft.com/windows/servercore        ltsc2022                        e60f47e635b7   7 weeks ago   4.84GB
mcr.microsoft.com/windows/nanoserver        ltsc2022                        f0ca29645006   7 weeks ago   292MB

D:\Terraform_Scripts\Docker>
```