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Experiment 6

A. Creating docker image using terraform

Prerequisite:

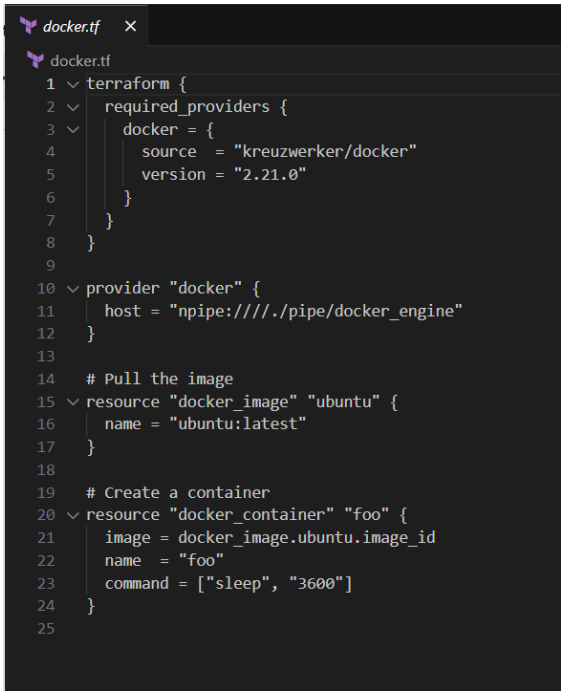
Step 1: Download and Install Docker Desktop from https://www.docker.com/
Check the docker functionality

```
PS C:\Users\veyda> 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
  checkpoint  Manage checkpoints
  compose*    Docker Compose
  container   Manage containers
  context     Manage contexts
  debug*      Get a shell into any image or container
  desktop*    Docker Desktop commands (Alpha)
  dev*        Docker Dev Environments
  extension*  Manages Docker extensions
  feedback*   Provide feedback, right in your terminal!
  image       Manage images
  init*       Creates Docker-related starter files for your project
  manifest    Manage Docker image manifests and manifest lists
  network     Manage networks
  plugin      Manage plugins
  sbom*       View the packaged-based Software Bill Of Materials (SBOM) for an image
  scout*      Docker Scout
  system      Manage Docker
  trust       Manage trust on Docker images
  volume      Manage volumes
```

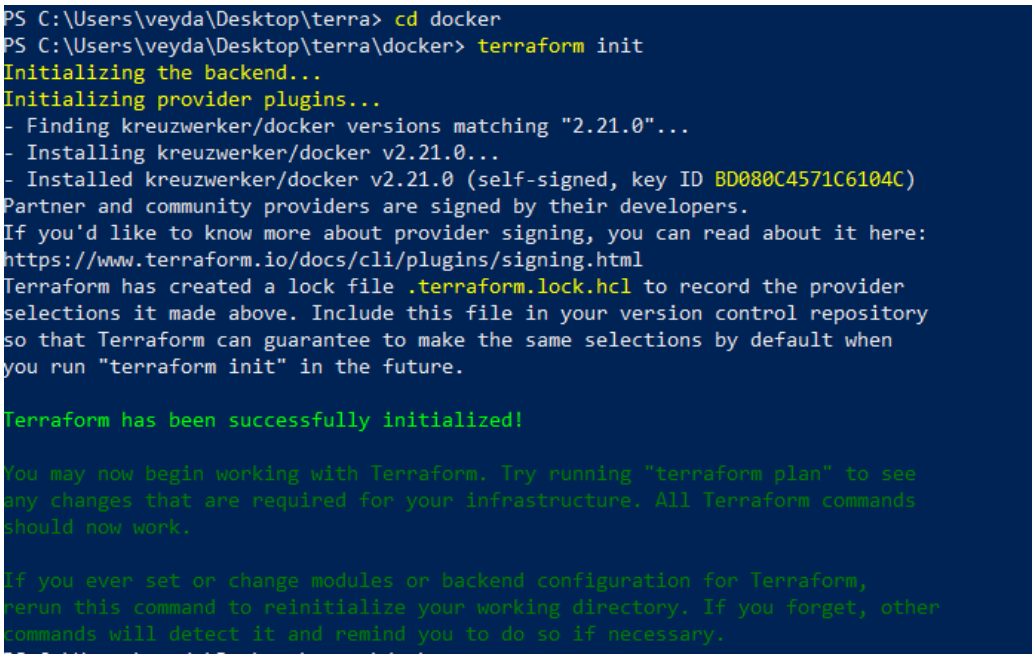
```
Command Prompt
Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Users\veyda>docker --version
Docker version 27.0.3, build 7d4bcd8
```

```
Microsoft Windows [Version 10.0.19045.4780]
(c) Microsoft Corporation. All rights reserved.

C:\Users\veyda>docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
31e907dcc94a: Pull complete
Digest: sha256:8a37d68f4f73ebf3d4efafbcf66379bf3728902a8038616808f04e34a9ab63ee
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

What's next:
    View a summary of image vulnerabilities and recommendations → docker scout quickview ubuntu

C:\Users\veyda>docker run -it ubuntu
root@0ea95fa5b779:/#
root@0ea95fa5b779:/#
```

Step 2: Create a folder called terra (do not use the word terraform or scripts as that may b e a keyword.)and then create a folder called docker inside it.
Then create a file called docker.tf



Step 3: Go to powershell, switch directory to where the docker.tf script was saved, then run the terraform init command.



Step 4: Execute terraform plan to view resources.

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```
PS C:\Users\veyda\Desktop\terra\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          = [
          + "sleep",
          + "3600",
        ]
      + 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)
```

Step 5: terraform show command for viewing all the state files

```
PS C:\Users\veyda\Desktop\terra\docker> terraform show
# docker_container.foo:
resource "docker_container" "foo" {
    attach            = false
    bridge            = null
    command           = [
        "sleep",
        "3600",
    ]
    cpu_set           = null
    cpu_shares        = 0
    domainname        = null
    entrypoint        = []
    env               = []
    gateway           = "172.17.0.1"
    hostname          = "dfaafae11b3b"
    id                = "dfaafae11b3bf9d4a108b967b3c24943543a9b381fc75576cc06cd4fce85ee72"
    image             = "sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598a"
    init              = false
    ip_address        = "172.17.0.2"
    ip_prefix_length  = 16
    ipc_mode          = "private"
    log_driver        = "json-file"
    logs              = false
    max_retry_count   = 0
    memory            = 0
    memory_swap       = 0
    must_run          = true
    name              = "foo"
    network_data      = [
        {
            gateway                   = "172.17.0.1"
            global_ipv6_address       = null
            global_ipv6_prefix_length = 0
            ip_address                = "172.17.0.2"
            ip_prefix_length          = 16
            ipv6_gateway              = null
            network_name              = "bridge"
        },
    ]
    network_mode      = "bridge"
    pid_mode          = null
    privileged        = false
    publish_all_ports = false
    read_only         = false
    remove_volumes    = true
    restart           = "no"
    rm                = false
    runtime           = "runc"
    security_opts     = []
    shm_size          = 64
```

Step 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”

Docker images before apply step:

```
PS C:\Users\veyda\Desktop\terra\docker> docker images
REPOSITORY   TAG       IMAGE ID   CREATED   SIZE
PS C:\Users\veyda\Desktop\terra\docker>
```

Docker images after apply step:

```
PS C:\Users\veyda\Desktop\terra\docker> docker images
REPOSITORY   TAG       IMAGE ID       CREATED       SIZE
ubuntu       latest    edbfe74c41f8   3 weeks ago   78.1MB
```

Step 7: terraform refresh command is helpful to sync your state file with the real-world infrastructure without applying any changes.

```
PS C:\Users\veyda\Desktop\terra\docker> terraform refresh
docker_image.ubuntu: Refreshing state... [id=sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598aubuntu:latest]
docker_container.foo: Refreshing state... [id=dfaafae11b3bf9d4a108b967b3c24943543a9b381fc75576cc06cd4fce85ee72]
```

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

```
PS C:\Users\veyda\Desktop\terra\docker> terraform destroy
docker_image.ubuntu: Refreshing state... [id=sha256:edbfe74c41f8a3501ce542e137cf28ea04dd03e6df8c9d66519b6ad761c2598aubuntu:latest]
docker_container.foo: Refreshing state... [id=dfaafae11b3bf9d4a108b967b3c24943543a9b381fc75576cc06cd4fce85ee72]

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

Terraform will perform the following actions:

  # docker_container.foo will be destroyed
  - resource "docker_container" "foo" {
      - attach           = false -> null
      - command          = [
          - "sleep",
```

Docker images After Executing Destroy step

```
Destroy complete! Resources: 2 destroyed.
PS C:\Users\veyda\Desktop\terra\docker> docker images
REPOSITORY   TAG       IMAGE ID   CREATED   SIZE
PS C:\Users\veyda\Desktop\terra\docker>
```

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