LAB EXERCISE 9

Aim: Creating Multiple EC2 Instances with for each in Terraform

Step 1: Create a main.tf file

```
main.tf
∨ SPCM-LAB-TERRA... [ the control of the control o
                                                                                                                                                                                                                         1 terraform {
          > .terraform
                                                                                                                                                                                                                             2 required_providers {
        ∨ lab_9
                                                                                                                                                                                                                  3 aws = {
4 source = "hashicorp/aws"
                                                                                                                                                                                                           4 source
5 version = "5.31.0"
                         main.tf
           > vpc_8

    ∃ .terraform.lock.hcl

        dev.tfvars
        instance.tf
       | provider _aws_ {
| region = "ap-south-1" |
| qa.tfvars | 12 | access_key = "AKIA54FX20TIW6MD2ETF" |
| terraform.tfstate | 13 | secret_key = "W3GFnerAlzg9rwxpSkdKFKun7uqM7G0e7BYt7Rt7" |
| vgriphle.tf | terraform.tfstate.backup | 14 |
                                                                                                                                                                                                                  10 provider "aws" {
        yariable.tf
```

Step 2: Create a instance.tf file

```
    instance tf X

                                     lab_9 > 🔭 instance.tf > ધ variable "instances" > 📅 default > 📅 instance2 > 🖭 instance_type
SPCM-LAB-TERRAFORM
                                              description = "Map of EC2 instances with settings"
                                               default = {
                                               "instance1" = {
   instance.tf
                                               ami = "ami-0e670eb768a5fc3d4"
instance_type = "t2.micro"
  main.tf

    ★ main.tf

    (1) terraform.tfstate
    8

    ➡ terraform.tfstate.backup
    9

    10
    10

  {} terraform.tfstate
                                               "instance2" = {
                                               ami = "ami-03f4878755434977f"

    .terraform.lock.hcl
    .

                                               instance_type = "t2.micro
dev.tfvars
instance.tf
                                               ami = "ami-09b9e25b6db1d130c"
y qa.tfvars
                                              instance_type = "t2.micro
{} terraform.tfstate
variable.tf
                                              ami = var.instances[each.key].ami
                                              instance_type = var.instances[each.key].instance_type
                                              tags = {
Name = "EC2-Instance-${each.key}"
```

Step 3: Now run terraform init command to Initialize.

Microsoft Windows [Version 10.0.19045.4046] (c) Microsoft Corporation. All rights reserved. F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_9>terraform init Initializing the backend... Initializing provider plugins... - Finding hashicorp/aws versions matching "5.31.0"... - Installing hashicorp/aws v5.31.0... - Installed hashicorp/aws v5.31.0 (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.

[./com 6/CDCM IAD/cncm lab tannafanm/lab 0)

Step 4: Now run the terraform validate command to check if any error is present or not.

If you ever set or change modules or backend configuration for Terraform,

rerun this command to reinitialize your working directory. If you forget, other

```
F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_9>terraform validate
Success! The configuration is valid.

F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_9>____
```

Step 5: Now run terraform plan command.

```
:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_9>terraform plan
 erraform used the selected providers to generate the following execution plan. Resource actions are indicated with the
following symbols:
+ create
erraform will perform the following actions:
 # aws_instance.ec2_instances["instance1"] will be created
+ resource "aws_instance" "ec2_instances" {
    resource
+ ami
        = "ami-0e670eb768a5fc3d4"
         instance_initiated_shutdown_behavior = (known after apply)
instance_lifecycle = (known after apply)
                                                   | (known after apply)
| (known after apply)
| "tz.micro"
| (known after apply)
         instance state
         instance_type
ipv6_address_count
         ipv6_addresses
key_name
         monitoring
         outpost_arn
password_data
         placement_group
placement_partition_number
         primary network interface id
         private_dns
         private_ip
         public dns
         public_ins
public_ip
secondary_private_ips
security_groups
source_dest_check
                                                            = (known after apply)
                                                            = (known after apply)
         spot instance request id
           ubnet_id
        tags
 C:\Windows\Svstem32\cmd.exe
                 = (known after apply)
                 = (known after apply)
= (known after apply)
= (known after apply)
= false
= (known after apply)
                 tenancy

tenancy
user_data
user_data_base64
user_data_replace_on_change
vpc_security_group_ids

       arn
                arn
associate_public_ip_address
availability_zone
cpu_core_count
cpu_threads_per_core
disable_api_stop
disable_api_termination
ebs_optimized
get_password_data
host_id
host_resource_group_arn
iam_instance_profile
id
                id
```

```
C:\Windows\System32\cmd.exe
              "Name" = "EC2-Instance-instance2"
         tags_all
              ____= {
"Name" = "EC2-Instance-instance2"
       + tenancy
                                                      = (known after apply)
                                                      = (known after apply)
       + user_data
                                                      = (known after apply)
       + user_data_base64
       + user_data_replace_on_change
                                                     = false
         vpc_security_group_ids
                                                      = (known after apply)
  # aws_instance.ec2_instances["instance3"] will be created
+ resource "aws_instance" "ec2_instances" {
       + ami
                                                      = "ami-09b9e25b6db1d130c"
                                                      = (known after apply)
       + associate_public_ip_address
                                                     = (known after apply)
       + availability_zone
                                                      = (known after apply)
                                                        (known after apply)
       + cpu_core_count
       + cpu_threads_per_core
                                                      = (known after apply)
       + disable_api_stop
                                                     = (known after apply)
       + disable_api_termination+ ebs_optimized
                                                      = (known after apply)
                                                      = (known after apply)
                                                      = false
       + get_password_data
                                                     = (known after apply)
       + host_id
       + host_resource_group_arn
+ iam_instance_profile
                                                      = (known after apply)
                                                      = (known after apply)
                                                      = (known after apply)
       + id
       + instance_initiated_shutdown_behavior = (known after apply)
       + instance_lifecycle
                                                      = (known after apply)
                                                        (known after apply)
         instance_state
                                                        "t2.micro "
       + instance type
                                                      = (known after apply)
       + ipv6_address_count
                                                      = (known after apply)
= (known after apply)
       + ipv6_addresses
       + key_name
                                                      = (known after apply)
       + monitoring
       + outpost_arn
                                                      = (known after apply)
                                                     = (known after apply)
= (known after apply)
       + password_data
       + placement_group
                                                     = (known after apply)
       + placement_partition_number
       + primary_network_interface_id
                                                     = (known after apply)
                                                     = (known after apply)
= (known after apply)
       + private_dns
       + private_ip
       + public_dns
                                                      = (known after apply)
       + public_ip
                                                     = (known after apply)
       + secondary_private_ips
                                                     = (known after apply)
       security_groups
                                                      = (known after apply)
       + source dest check
                                                        true
       + spot_instance_request_id
                                                     = (known after apply)
     user_data
                                 = (known after apply)
    + user_data_base64
                                 = (known after apply)
    + user_data_replace_on_change
                                 = (known after apply)
     vpc_security_group_ids
Plan: 3 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 take exactly these actions if you run "terraform apply" now.
F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_9>_
```

LAB EXERCISE 10

Aim: Creating an AWS RDS Instance in Terraform

Step 1: Create a main.tf file

```
EXPLORER
                          main.tf
                                    × rds.tf
∨ SPCM-LAB-TERRAFORM
                           lab_10 > 🔭 main.tf > 😭 provider "aws"
                             1 terraform {
 > .terraform
                             2 required providers {
 ∨ lab_9
   > .terraform
                             3 aws = {
                             4 source = "hashicorp/aws"
   5 version = "5.31.0"
   instance.tf
   main.tf
   {} terraform.tfstate
   provider "aws" {

✓ lab_10

                                region = "ap-south-1"
   main.tf
                            12 access_key = "AKIA54FX20TIW6MD2ETF"
   rds.tf
                                secret key = "W3GFnerAlzg9rwxpSkdKFKun7uqM7G0e7BYt7Rt7"
 > vpc_8
                            14
 dev.tfvars
 🍸 instance.tf
```

Step 2: Create a rds.tf file

```
EXPLORER
                             lab_10 > 🔭 rds.tf > 😂 resource "aws_db_instance" "My-RDS" > 🔀 publicly_accessible

✓ SPCM-LAB-TERRAFORM

                                    resource "aws_db_instance" "My-RDS" {
 > .terraform
 ∨ lab_9
                                    engine = "mysql"
                                     engine_version = "5.7"
    > .terraform
                                    instance_class = "db.t2.micro"
    username = "admin"
   instance.tf
                              8 password = "admin123"
   9 10 serraform.tfstate 10 11 lab_10 11
   🏋 main.tf
                              parameter_group_name = "default.mysql5.7"
   {} terraform.tfstate
                                    skip_final_snapshot = true
                                     publicly_accessible = true
 ∨ lab_10
    > .terraform
    main.tf
   rds.tf
```

Step 3: Now run terraform init command to Initialize.

```
Microsoft Windows [Version 10.0.19045.4046]
(c) Microsoft Corporation. All rights reserved.

F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_10>terraform init

Initializing the backend...

Initializing provider plugins...
- Finding hashicorp/aws versions matching "5.31.0"...
- Installing hashicorp/aws v5.31.0...
- Installed hashicorp/aws v5.31.0 (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.

F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_10>
```

Step 4: Now run the terraform validate command to check if any error is present or not.

```
F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_10>terraform validate Success! The configuration is valid.

F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_10>_
```

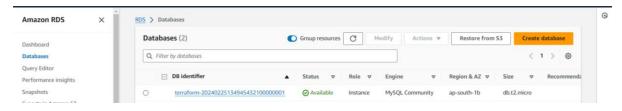
Step 5: Now run terraform plan command.

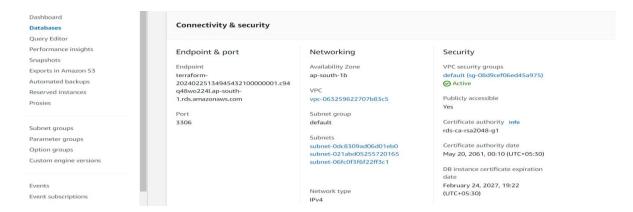
```
performance_insights_enabled
                                                 = false
      + performance_insights_kms_key_id
                                                 = (known after apply)
      + performance_insights_retention_period = (known after apply)
                                                 = (known after apply)
      + port
      + publicly_accessible
                                                 = true
      + replica_mode
                                                 = (known after apply)
      + replicas
                                                 = (known after apply)
      + resource_id
                                                 = (known after apply)
      + skip_final_snapshot
+ snapshot_identifier
                                                 = true
                                                = (known after apply)
                                                = (known after apply)
      + status
      + storage_throughput
                                                = (known after apply)
                                                 = (known after apply)
      + storage_type
      + tags_all
                                                 = (known after apply)
                                                = (known after apply)
= "admin"
      + timezone
      + username
      + vpc_security_group_ids
                                                = (known after apply)
Plan: 1 to add, 0 to change, 0 to destroy.
Note: You didn't use the -out option to save this plan, so Terraform
F:\sem 6\SPCM_LAB\spcm-lab-terraform\lab_10>_
```

Step 6: Now run the terraform apply command to apply the rds.

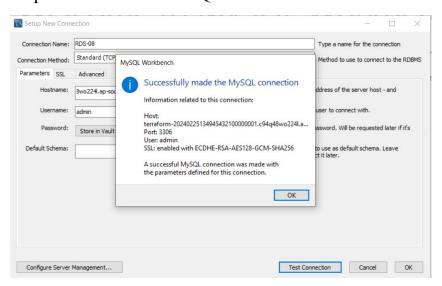
```
. C:\Windows\System32\cmd.exe
           network_type
                                                                        (known after apply)
(known after apply)
"default.mysq15.7"
           option group name
           parameter_group_name
            password
                                                                        (sensitive value)
                                                                        false
           performance_insights_enabled
                                                                        (known after apply)
(known after apply)
(known after apply)
            performance_insights_kms_key_id
           performance_insights_retention_period =
           publicly_accessible replica_mode
                                                                        true
                                                                        (known after apply)
(known after apply)
(known after apply)
            replicas
           resource id
           skip_final_snapshot
snapshot_identifier
                                                                        (known after apply)
                                                                        (known after apply)
            status
            storage_throughput
                                                                        (known after apply)
           storage_type
tags_all
                                                                        (known after apply)
(known after apply)
           timezone
                                                                        (known after apply)
"admin"
           username
                                                                     = (known after apply)
           vpc_security_group_ids
Plan: 1 to add, 0 to change, 0 to destroy.
Do you want to perform these actions?
      rraform will perform the actions described above.
ly 'yes' will be accepted to approve.
  Enter a value: yes
 ws db instance.My-RDS: Creating.
aws_db_instance.My-RDS: Still creating...
                                                [10s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [20s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [30s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [40s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [50s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [1m0s elapsed]
ws_db_instance.My-RDS: Still creating...
                                                [1m10s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [1m20s elapsed]
ws_db_instance.My-RDS: Still creating...
                                                [1m30s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [1m40s elapsed]
ws_db_instance.My-RDS: Still creating...
                                                [1m51s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [2m1s elapsed]
aws_db_instance.My-RDS: Still creating...
                                                [2m11s elapsed]
aws_db_instance.My-RDS: Still creating...
aws_db_instance.My-RDS: Still creating...
                                                [2m21s elapsed]
                                                [2m31s elapsed]
aws_db_instance.My-RDS: Still creating...
aws_db_instance.My-RDS: Still creating...
                                                [2m41s elapsed]
                                                [2m51s elapsed]
aws_db_instance.My-RDS: Still creating...
aws_db_instance.My-RDS: Still creating...
                                                [3m1s elapsed]
                                                [3m11s elapsed]
aws_db_instance.My-RDS: Still creating...
aws_db_instance.My-RDS: Still creating...
                                                [3m21s elapsed]
                                                [3m31s elapsed]
                                               [3m41s elapsed]
[3m51s elapsed]
aws db instance.My-RDS: Still creating...
aws_db_instance.My-RDS: Still creating...
aws_db_instance.My-RDS: Still creating... [4m1s elapsed]
aws_db_instance.My-RDS: Still creating... [4m11s elapsed]
aws_db_instance.My-RDS: Still creating... [4m21s elapsed]
ws_db_instance.My-RDS: Creation complete after 4m29s [id=db-ZBR2QLPZLUV0IW2F2RX2ULG3GI]
 :\sem 6\SPCM_LAB\spcm-lab-terraform\lab_10>_
```

Step 7: Verify the RDS Instance in AWS Console.





Step 8: Connect To MYSQL Workbench.



Step 9: Now Destroying the rds created.

```
C:\Windows\System32\cmd.exe
         performance_insights_retention_period = 0 -> null
                                                      = 3306 -> null
         publicly_accessible
                                                      = true -> null
                                                      = [] -> null
= "db-ZBR2QLPZLUVOIW2F2RX2ULG3GI" -> null
         replicas
         resource_id
         skip_final_snapshot
                                                      = true -> null
                                                      = "available" -> null
         status
         storage_encrypted storage_throughput
                                                      = false -> null
                                                      = 0 \rightarrow null
                                                      = "gp2" -> null
         storage_type
         tags
         tags all
                                                         "admin" -> null
         username
         vpc_security_group_ids
              "sg-08d9cef06ed45a975",
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
```

```
lan: 0 to add, 0 to change, 1 to destroy.
  Oo 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
aws_db_instance.My-RDS: Destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 10s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 20s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 30s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 40s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 50s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 1m0s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 1m0s elapsed]
 aws_db_instance.My-RDS: Still destroying...
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 1m10s elapsed]
                                                                                                             [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 1m20s elapsed]
[id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 1m30s elapsed]
 aws_db_instance.My-RDS: Still destroying...
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 1m40s elapsed]
                                                                                                             [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 1m50s elapsed]
[id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 2m0s elapsed]
 aws_db_instance.My-RDS: Still destroying...
aws_db_instance.My-RDS: Still destroying...
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 2m10s elapsed]
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 2m20s elapsed]
 aws_db_instance.My-RDS: Still destroying...
aws_db_instance.My-RDS: Still destroying...
aws_db_instance.My-RDS: Still destroying...
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 2m30s elapsed]
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 2m40s elapsed]
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 2m50s elapsed]
 aws_db_instance.My-RDS: Still destroying...
aws_db_instance.My-RDS: Still destroying...
aws_db_instance.My-RDS: Still destroying...
                                                                                                              [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 3m0s elapsed]
                                                                                                             [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 3m10s elapsed]
[id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 3m20s elapsed]
 aws_db_instance.My-RDS: Still destroying...
                                                                                                             [id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 3m30s elapsed]
[id=db-ZBR2QLPZLUVOIW2F2RX2ULG3GI, 3m40s elapsed]
 aws_db_instance.My-RDS: Still destroying... [id=db-ZBRZQLPZLUVOIW2F2RX2ULG3GI, 3m40s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBRZQLPZLUVOIW2F2RX2ULG3GI, 4m0s elapsed]
aws_db_instance.My-RDS: Still destroying... [id=db-ZBRZQLPZLUVOIW2F2RX2ULG3GI, 4m10s elapsed]
aws_db_instance.My-RDS: Destruction complete after 4m14s
   :\sem 6\SPCM_LAB\spcm-lab-terraform\lab_10>
```

