Lab 6. Terraform modules

Background:

Here, we learn how to create and use terraform modules. Modules are used to separate template groups into logical components. We will create and use a module in this exercise.

Tasks:

1. Make a directory called ‘lab6’ underneath the terraform-labs directory.
2. Change into the directory.
3. Make a directory called modules.
4. Change into the modules directory
5. Create two more directories, vpc and instances.
6. Go back to the top level lab6 directory.

Create the following files: main.tf, variables.tf

Here is the source code for the main.tf file:

```
provider "aws" {

    access_key  = "AKIAIZAHH7GJN6ASXVVA"
    secret_key = "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"
#    access_key = "${var.access_key}"
#    secret_key = "{$var.secret_key}"
    region = "${var.region}"
}


module "vpc_module" {
    source = "./modules/vpc"
    region = "${var.region}"
}

module "instance_module" {
    source = "./modules/instances"
    region = "${var.region}"
}
```

Here is the source code for the variables.tf file.

```
variable "access_key" {
    default = "AKIAIZAHH7GJN6ASXVVA"
}

variable  "secret_key" {
    default = "YFV3j/blEhzzP7HlhNXWk+RmPrbehBdA47VdBvi7"
}


resource "aws_instance" "example" {
    ami = "ami-0ac019f4fcb7cb7e6"
    instance_type = "t2.micro"
}


variable "region" {
    default =  "us-east-1"
}
```

7. Change to the modules/vpc directory.

Create the following files: main.tf vars.tf output.tf

Here is the source code for main.tf:

```
resource "aws_vpc" "main_vpc" {
    cidr_block = "${var.vpc_cidr}"
    instance_tenancy = "default"
    tags {
        Name = "Main"
        Location = "London"
    }
}

resource "aws_subnet" "vpc_subnets" {
    count = "${length(var.vpc_subnet_cidr)}"
    vpc_id = "${aws_vpc.main_vpc.id}"
    cidr_block = "${element(var.vpc_subnet_cidr,count.index)}"
    availability_zone = "$
{element(var.aaz[var.region],count.index)}"
    tags {
        Name = "subnet-${count.index+1}"
   }
}
```

Here is the source code for vars.tf:

```
variable "region" {}
variable "vpc_cidr" {
    default = "192.168.0.0/16"
}

variable "vpc_subnet_cidr" {
    type = "list"
    default =
["192.168.100.0/24","192.168.101.0/24","192.168.102.0/24"]
}

variable "ami_instance" {
    type = "map"
    default = {
                "us-east-1" = "ami-0ac019f4fcb7cb7e6"
                "us-east-2" = "ami-0f65671a86f061fcd"
                "us-west-1" = "ami-063aa838bd7631e0b"
    }
}

variable "ami_instance_type" {
    default = "t2.micro"
}
variable "aaz" {
    type = "map"
    default = {
                "us-east-1" = ["us-east-1a","us-east-1b","us-east-
1c"]
                "us-east-2" = ["us-east-2a","us-east-2b","us-east-
2c"]
                "us-west-1" = ["us-west-1a","us-west-1b","us-west-
1c"]
    }
}
```

Here is the source code for outputs.tf

```
output "aaz" {
    value = "${var.aaz}"
}

output "vpc_subnet_cidr" {
    value = "${var.vpc_subnet_cidr}"
}

output "subnet_ids" {
    value = "${aws_subnet.vpc_subnets.*.id}"
}
```

8. Change to the modules/instances directory.

9. Create the following files: main.tf variables.tf

Here is the source code for main.tf:

```
module "vpc_module"  {
    source = "../vpc"
    region = "${var.region}"
}

resource "aws_instance" "webserver" {
    count = "${length(module.vpc_module.aaz[var.region])}"
    ami = "${lookup(var.ami_instance,var.region)}"
    subnet_id = "$
{element(module.vpc_module.subnet_ids,count.index)}"
    instance_type = "${var.ami_instance_type}"
    key_name = "terraform-course-keypair"
}
```

Here is the source code for vars.tf:

```
variable "region" {}
variable "ami_instance" {
    type = "map"
    default = {
                "us-east-1" = "ami-0ac019f4fcb7cb7e6"
                "us-east-2" = "ami-0f65671a86f061fcd"
                "us-west-1" = "ami-063aa838bd7631e0b"
    }
}

variable "ami_instance_type" {
    default = "t2.micro"
}
```

10. Change to the top level lab6 directory.

11. Run the following commands:

```
> terraform get

 > terraform init
```

Note that the '>' refers to the bash shell prompt and is not part of the command.

This command initializes the terraform directory structure.

7. Run the following command:

```
> terraform plan
```

This should print out what actions terraform will take.

8. Run the following command:

```
> terraform apply
```

Assuming that this works correctly, AWS create a VPC, three subnets located in three different availabilitgy zones, and an ami instance running on each subnet.

9.. Run the following:

```
> terraform destroy
```

This will now destroy the formerly created AWS vpc, and all subnets.