

Graded Assignment 5.5 (a) & (b)

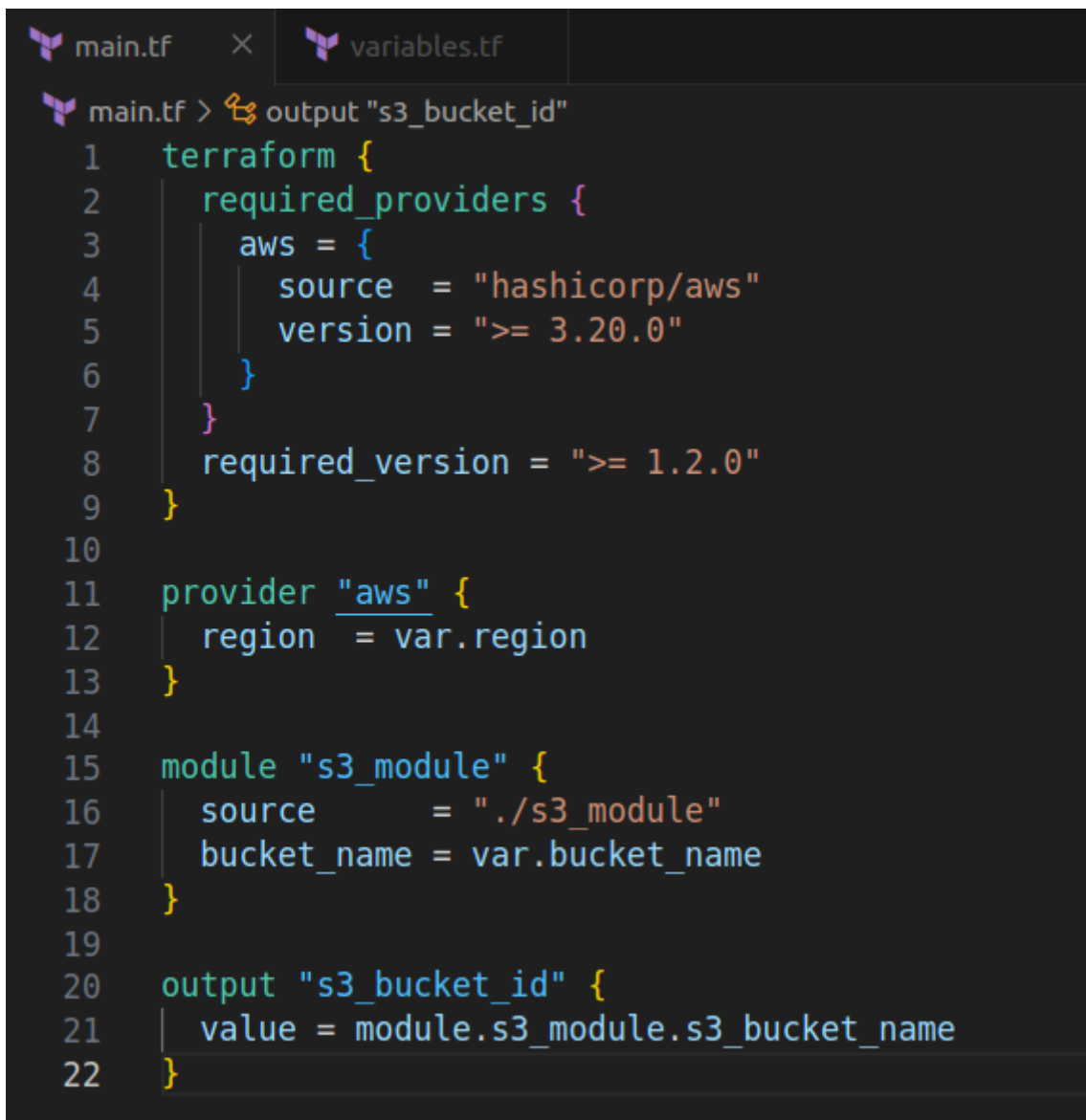
Name: Saad Sameer Khan

Employee#: 2303.KHI.DEG.034

Collaborated with: Mohammad Hamza Asim (2303.KHI.DEG.014)

main.tf

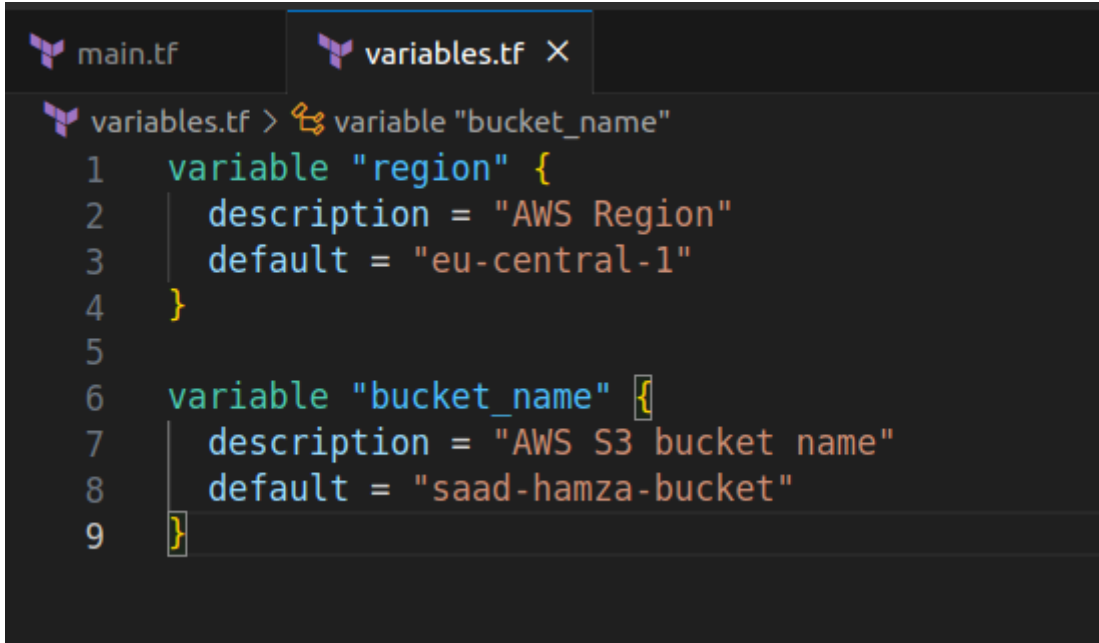
- First we defined the providers we're using, AWS in our case.
- Next, we defined a region for our provider, via a variable.
- Next, we defined the module which contains the resources, and outputs we're going to be using. We also gave a name to our bucket via a variable.
- And finally, we provided an output block which will display the bucket ID on the terminal.



```
main.tf > output "s3_bucket_id"
1  terraform {
2      required_providers {
3          aws = {
4              source  = "hashicorp/aws"
5              version = ">= 3.20.0"
6          }
7      }
8      required_version = ">= 1.2.0"
9  }
10
11  provider "aws" {
12      region = var.region
13  }
14
15  module "s3_module" {
16      source      = "./s3_module"
17      bucket_name = var.bucket_name
18  }
19
20  output "s3_bucket_id" {
21      value = module.s3_module.s3_bucket_name
22  }
```

variables.tf (of main file)

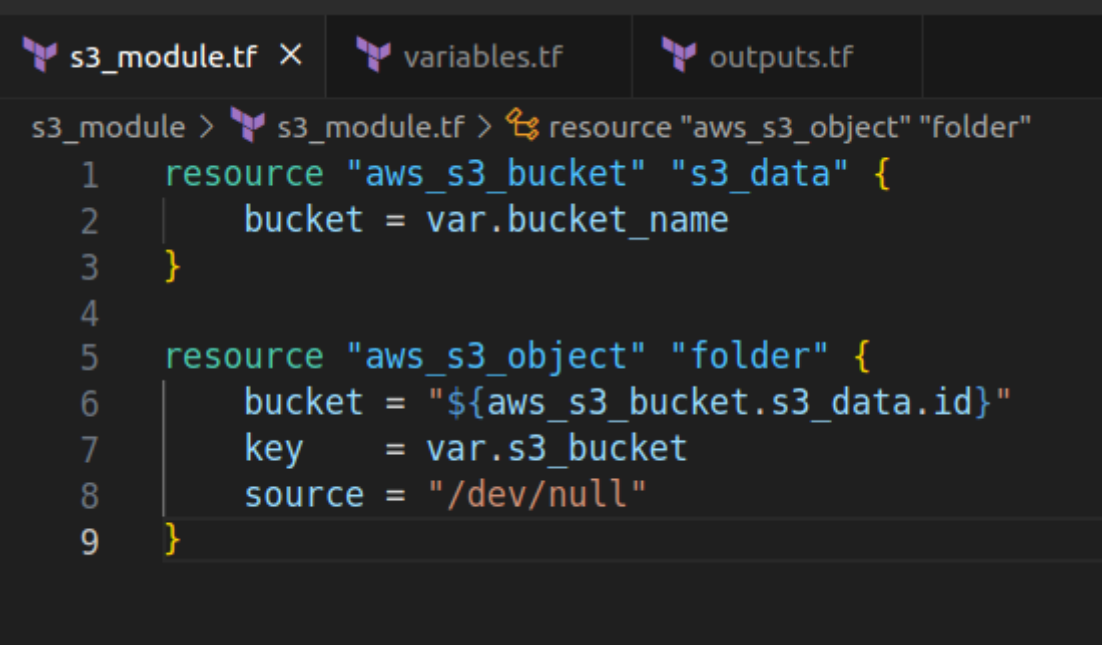
- Here, we have just set the region name, “eu-central-1”
- and the name for our bucket “saad-hamza-bucket”



```
main.tf  variables.tf X
variables.tf > variable "bucket_name"
1  variable "region" {
2      description = "AWS Region"
3      default = "eu-central-1"
4  }
5
6  variable "bucket_name" {
7      description = "AWS S3 bucket name"
8      default = "saad-hamza-bucket"
9  }
```

s3_module.tf

- We first create the bucket and also give a name to this resource “s3_data” which can be referenced by other resources.
- Next, we create a folder inside this bucket.
 - we first define which bucket we want to create the folder in.
 - the path of the folder inside the bucket is given via a variable called “s3_bucket”
 - finally, “/dev/null” defines that this will be an empty folder.



The screenshot shows a code editor with three tabs: `s3_module.tf` (active), `variables.tf`, and `outputs.tf`. The active tab contains the following Terraform code:

```
s3_module > s3_module.tf > resource "aws_s3_object" "folder"
1  resource "aws_s3_bucket" "s3_data" {
2    bucket = var.bucket_name
3  }
4
5  resource "aws_s3_object" "folder" {
6    bucket = "${aws_s3_bucket.s3_data.id}"
7    key    = var.s3_bucket
8    source = "/dev/null"
9  }
```

variables.tf (of s3_module)

- We have given a “bucket_name” variable again, so that it can be referenced in the s3_module.tf file.
- Then, we have defined a path for our folder inside the bucket “day2/IaC”. This is also referenced in the above s3_module.tf

```
s3_module > variables.tf > variable "s3_bucket"
1  variable "bucket_name" {
2    description = "AWS S3 bucket name"
3    default = "saad-hamza-bucket"
4  }
5
6  variable "s3_bucket" {
7    description = "Path for S3 bucket directory"
8    default = "day2/IaC/"
9  }
```

outputs.tf

- here, we have simply given the value that will be output to the screen. In our case, we’re outputting the bucket ID (“saad-hamza-bucket”)

```
s3_module > outputs.tf > ...
1  output "s3_bucket_name" {
2    description = "AWS S3 bucket name"
3    value = aws_s3_bucket.s3_data.id
4  }
5
```

Results:

- First, we use terraform init to initialize terraform in our current folder.

```
• (base) saadsameerkhan@all-MS-7D35:~/Documents/Assignments/Unit 5.5$ terraform init

Initializing the backend...
Initializing modules...
- s3_module in s3_module

Initializing provider plugins...
- Finding hashicorp/aws versions matching ">= 3.20.0"...
- Installing hashicorp/aws v4.67.0...
- Installed hashicorp/aws v4.67.0 (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.
```

- Next, we do “terraform apply” to see what changes will take place.

```
• (base) saadsameerkhan@all-MS-7D35:~/Documents/Assignments/Unit 5.5$ 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:

# module.s3_module.aws_s3_bucket.s3_data will be created
+ resource "aws_s3_bucket" "s3_data" {
  + acceleration_status      = (known after apply)
  + acl                      = (known after apply)
  + arn                     = (known after apply)
  + bucket                  = "saad-hamza-bucket"
  + bucket_domain_name      = (known after apply)
  + bucket_prefix           = (known after apply)
  + bucket_regional_domain_name = (known after apply)
  + force_destroy           = false
  + hosted_zone_id          = (known after apply)
}
```

- We also see that our bucket name is displayed on the terminal after we did “terraform apply”

```
Only 'yes' will be accepted to approve.

Enter a value: yes

module.s3_module.aws_s3_bucket.s3_data: Creating...
module.s3_module.aws_s3_bucket.s3_data: Creation complete after 4s [id=saad-hamza-bucket]
module.s3_module.aws_s3_object.folder: Creating...
module.s3_module.aws_s3_object.folder: Creation complete after 1s [id=day2/IaC/]

Apply complete! Resources: 2 added, 0 changed, 0 destroyed.

Outputs:

s3_bucket_id = "saad-hamza-bucket"
(base) saad@workhar011:~$ cd /Documents/Assignments/Unit 5 5$
```

- Now we open AWS S3, and see that there is a bucket with the name “saad-hamza-bucket”

Amazon S3 > Buckets

▼ Account snapshot View Storage Lens dashboard

Last updated: May 20, 2023 by Storage Lens. Metrics are generated every 24 hours. [Learn more](#)

Total storage	Object count	Average object size	You can enable advanced metrics in the "default-account-dashboard" configuration.
759.2 KB	99	7.7 KB	

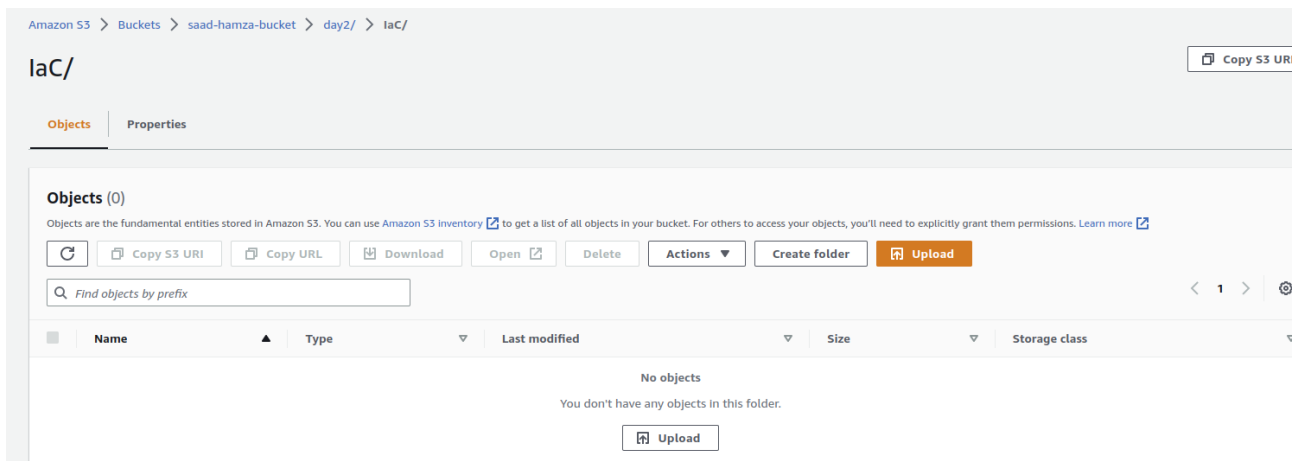
Buckets (2) [Info](#)

Buckets are containers for data stored in S3. [Learn more](#)

< 1 > ⚙

Name	AWS Region	Access	Creation date
saad-hamza-bucket	EU (Frankfurt) eu-central-1	Bucket and objects not public	May 22, 2023, 08:25:21 (UTC+05:00)

- We go inside this bucket and find that there is an empty folder created with the path “day2/IaC”



- Finally, we do “terraform destroy” to get rid of all the resources created using terraform.

```

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  COMMENTS
s3_bucket_id = "saad-hamza-bucket"
(base) saadsameerkhan@all-MS-7D35:~/Documents/Assignments/Unit 5.5$ terraform destroy
module.s3_module.aws_s3_bucket.s3_data: Refreshing state... [id=saad-hamza-bucket]
module.s3_module.aws_s3_object.folder: Refreshing state... [id=day2/IaC/]

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:

# module.s3_module.aws_s3_bucket.s3_data will be destroyed
- resource "aws_s3_bucket" "s3_data" {
  - arn                = "arn:aws:s3:::saad-hamza-bucket" -> null
  - bucket             = "saad-hamza-bucket" -> null
  - bucket_domain_name = "saad-hamza-bucket.s3.amazonaws.com" -> null
  - bucket_regional_domain_name = "saad-hamza-bucket.s3.eu-central-1.amazonaws.com" -> null
  - force_destroy      = false -> null
  - hosted_zone_id     = "Z21DN0UVTQW6Q" -> null
  - metadata           = {} -> null
  - server_side_encryption = "AES256" -> null
  - source             = "/dev/null" -> null
  - storage_class       = "STANDARD" -> null
  - tags               = {} -> null
  - tags_all           = {} -> null
}

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

Changes to Outputs:
- s3_bucket_id = "saad-hamza-bucket" -> null

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

module.s3_module.aws_s3_object.folder: Destroying... [id=day2/IaC/]
module.s3_module.aws_s3_object.folder: Destruction complete after 1s
module.s3_module.aws_s3_bucket.s3_data: Destroying... [id=saad-hamza-bucket]
module.s3_module.aws_s3_bucket.s3_data: Destruction complete after 1s

Destroy complete! Resources: 2 destroyed.
(base) saadsameerkhan@all-MS-7D35:~/Documents/Assignments/Unit 5.5$

```