



FATIMA JINNAH WOMEN UNIVERSITY

Submitted To:

Engr. Muhammad Shoaib

Submitted By:

Irraj Samreen(027)

Section:

5A

Cloud Computing

LAB11

TASK1

main.tf

main.tf

```
1 provider "aws" {
2     shared_config_files      = ["~/.aws/config"]
3     shared_credentials_files = ["~/.aws/credentials"]
4 }
5
```

PROBLEMS

OUTPUT

TERMINAL

PORTS

bash

@23-22411-027-max → /workspaces/LAB11CC (main) \$ terraform init

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.

@23-22411-027-max → /workspaces/LAB11CC (main) \$

main.tf

main.tf

```
1 # AWS provider
2 provider "aws" {
3     shared_config_files      = ["~/.aws/config"]
4     shared_credentials_files = ["~/.aws/credentials"]
5 }
6
7 # Variable for subnet CIDR block
8 variable "subnet_cidr_block" {
9     type    = string
10    default = "10.0.0.0/24" # default value
11 }
12
13 # Output to show variable value
14 output "subnet_cidr_block_output" {
15     value = var.subnet_cidr_block
16 }
```

```
-----  
@23-22411-027-max → /workspaces/LAB11CC (main) $ touch terraform.tfvars  
nano terraform.tfvars  
@23-22411-027-max → /workspaces/LAB11CC (main) $ terraform apply -auto-approve -var
```

```
@23-22411-027-max → /workspaces/LAB11CC (main) $ terraform apply -auto-approve -var "subnet_cidr_block=10.0.40.0/24"  
any real infrastructure.
```

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

Outputs:

```
subnet_cidr_block_output = "10.0.40.0/24"
```

```
@23-22411-027-max → /workspaces/LAB11CC (main) $
```

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```
@23-22411-027-max → /workspaces/LAB11CC (main) $ printenv | grep TF_VAR_  
unset TF_VAR_subnet_cidr_block  
printenv | grep TF_V  
TF_VAR_subnet_cidr_b Focus folder in explorer (ctrl + click)  
@23-22411-027-max → /workspaces/LAB11CC (main) $ export TF_VAR_subnet_cidr_block=10.0.20.0/24  
printenv | grep TF_VAR_  
TF_VAR_subnet_cidr_block=10.0.20.0/24  
@23-22411-027-max → /workspaces/LAB11CC (main) $ unset TF_VAR_subnet_cidr_block  
@23-22411-027-max → /workspaces/LAB11CC (main) $ printenv | grep TF_VAR
```

TASK2

```
main.tf  
4 provider aws {  
5 }  
6  
7 variable "subnet_cidr_block" {  
8     type      = string  
9     default    = ""  
10    description = "CIDR block to assign to the application subnet"  
11    sensitive   = false  
12    nullable    = false  
13    ephemeral   = false  
14  
15    validation {  
16        condition     = can(regex("^[0-9]{1,3}\\.[0-9]{1,3}\\.[0-9]{1,3}/[0-9]+$", v  
17        error_message = "The subnet_cidr_block must be a valid CIDR notation"  
18    }  
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash + - [] [] ... | [] [] X

```
@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve -var "subnet_cidr_block=10.0.0"
```

```
var.subnet_cidr_block is "10.0.0"
```

The subnet_cidr_block must be a valid CIDR notation string, such as 10.0.0.0/24.

This was checked by the validation rule at main.tf:15,3-13.

```
@23-22411-027-max →/workspaces/LAB11CC (main) $
```

Ln 20, Col 1 Spaces: 2 UTF-8

```
main.tf
18  variable "subnet_cidr_block" {
19  }
20  variable "api_session_token" {
21    variable "api_session_token" {
22      type      = string
23      default   = ""
24      description = "Short-lived API session token"
25      sensitive  = true
26      nullable   = false
27      ephemeral  = true
28    }
29  }
30
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash + - [] [] ... | [] [] X

```
@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve -var "subnet_cidr_block=10.0.0.0/24"
```

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

Outputs:

```
api_session_token_output = <sensitive>
subnet_cidr_block_output = "10.0.0.0/24"
```

```
@23-22411-027-max →/workspaces/LAB11CC (main) $
```

Ln 27, Col 1 Spaces: 2 UTF-8

```

● @23-22411-027-max →/workspaces/LAB11CC (main) $ cat terraform.tfstate | grep api_session_token_
output -A 5
    "api_session_token_output": {
      "value": "my_API_session_Token",
      "type": "string",
      "sensitive": true
    }
  },
○ @23-22411-027-max →/workspaces/LAB11CC (main) $

```

```

main.tf
31 variable "api_session_token" {
32     type          = string
33     default       = "my_API_session_Token" # <-- Default value set
34     description   = "Short-lived API session token used during apply operation"
35     sensitive     = true                    # Output will remain masked
36     nullable     = false
37     ephemeral     = false
38
39     validation {
40         condition     = can(regex("^[A-Za-z0-9-]{20,}$", var.api_session_token))
41         error_message = "The API session token must be at least 20 characters long"
42     }
43 }
44
45 output "api_session_token_output" {
46     value = var.api_session_token

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```

@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve -var "subnet_cidr_block=10.0.0.0/24"

```

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

Outputs:

```

api_session_token_output = <sensitive>
subnet_cidr_block_output = "10.0.0.0/24"
○ @23-22411-027-max →/workspaces/LAB11CC (main) $

```

Ln 27, Col 1 Spaces: 2 UTF-8

TASK3

main.tf

```
44
45 output "api_session_token_output" {
46     value      = var.api_session_token
47     sensitive = true
48 }
49 variable "environment" {}
50 variable "project_name" {}
51 variable "primary_subnet_id" {}
52 variable "subnet_count" {}
53 variable "monitoring" {}
54
```

```
@23-22411-027-max →/workspaces/LAB11CC (main) $ aws ec2 describe-subnets \
--filters "Name=availability-zone,Values=me-central-1a" \
--query "Subnets[].SubnetId" \
--output text
subnet-0af12daab35e04f30      subnet-0a80547ecbb2cf81d      subnet-0b43671a86afa8c1b
@23-22411-027-max →/workspaces/LAB11CC (main) $
n  (a) n      1a 54 Col 1  Screen 2  LITE 0
subnet-0af12daab35e04f30      subnet-0a80547ecbb2cf81d      subnet-0b43671a86afa8c1b
@23-22411-027-max →/workspaces/LAB11CC (main) $ touch terraform.tfvars
nano terraform.tfvars
```

```
GNU nano 7.2 terraform.tfvars *
environment      = "dev"
project_name     = "lab_work"
primary_subnet_id = "subnet-0abcd1234ef567890" # Replace with actual subnet ID
subnet_count     = 3
monitoring       = true

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
Ln 54, Col 1  Spaces: 2  UTF-8

nano terraform.tfvars
@23-22411-027-max → /workspaces/LAB11CC (main) $ touch locals.tf
nano locals.tf

GNU nano 7.2 locals.tf *
is_production    = var.environment == "prod"
monitoring_enabled = var.monitoring || local.is_production
}

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
Ln 0, Col 0   Spaces: 0  UTF-8
```

```
main.tf
1 variable "primary_subnet_id" {}
2 variable "subnet_count" {}
3 variable "monitoring" {}
4 output "resource_name" {
5   value = local.resource_name
6 }
7
8 output "primary_public_subnet" {
9   value = local.primary_public_subnet
10 }
11
12 output "subnet_count" {
13   value = local.subnet_count
14 }
15
16 output "value" = local.is_production

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS bash + v [ ] [ ] ... |
@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve

api_session_token_output = <sensitive>
is_production = false
monitoring_enabled = true
primary_public_subnet = "subnet-0abcd1234ef567890"
resource_name = "lab_work-dev"
subnet_cidr_block_output = "10.0.30.0/24"
subnet_count = 3
> @23-22411-027-max →/workspaces/LAB11CC (main) $
```

Task4 and 5

main.tf U X

main.tf

```
81
82 # Object variable
83 variable "server_config" {
84     type = object({
85         name           = string
86         instance_type  = string
87         monitoring      = bool
88         storage_gb      = number
89         backup_enabled = bool
90     })
91 }
92
93 output "server_config" {
94     value = var.server_config
95 }
```

main.tf U

terraform.tfvars U X

terraform.tfvars

```
6 monitoring      = true
7 tags = {
8     Environment = "dev"
9     Project     = "sample-app"
10    Owner       = "platform-team"
11 }
12
13 server_config = {
14     name           = "web-server"
15     instance_type  = "t3.micro"
16     monitoring      = true
17     storage_gb      = 20
18     backup_enabled = false
19 }
20
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

bash + v [] [X] ... []

@23-22411-027-max → /workspaces/LAB11CC (main) \$ terraform apply -auto-approve

```
}
subnet_cidr_block_output = "10.0.30.0/24"
subnet_count = 3
tags = tomap({
  "Environment" = "dev"
  "Owner" = "platform-team"
  "Project" = "sample-app"
})
```

② @23-22411-027-max → /workspaces/LAB11CC (main) \$

Ln 20, Col 1

Spaces: 4 LINT

main.tf U X

terraform.tfvars U

main.tf

```
107 variable "availability_zones" {
108     default = ["me-central-1a", "me-central-1b", "me-central-1c"]
109 }
110
111
112 output "compare_collections" {
113     value = {
114         list_example  = var.server_names
115         tuple_example = var.server_metadata
116         set_example   = var.availability_zones
117     }
118 }
119
```

main.tf U

locals.tf U X

terraform.tfvars U

locals.tf

```
1  locals {
2      primary_public_subnet = var.primary_subnet_id
3      subnet_count          = var.subnet_count
4      is_production         = var.environment == "prod"
5      monitoring_enabled    = var.monitoring || local.is_production
6  }
7  locals {
8      mutated_list = setunion(var.server_names, ["web-3"])
9      mutated_tuple = setunion([for t in var.server_metadata : tostring(t)
10      mutated_set   = setunion(var.availability_zones, ["me-central-1c"])
11  }
12
13
```

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```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

bash

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⋮

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```
@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
}
subnet_cidr_block_output = "10.0.30.0/24"
subnet_count = 3
tags = tomap({
  "Environment" = "dev"
  "Owner" = "platform-team"
  "Project" = "sample-app"
})
@23-22411-027-max →/workspaces/LAB11CC (main) $
```

TASK 6

main.tf U × locals.tf U terraform.tfvars U

main.tf

```
124 }
125 # Optional tag (nullable / null default)
126 variable "optional_tag" {
127     type          = string
128     description = "A tag that may or may not be provided"
129     default       = null
130 }
131
132 # Any type variable (dynamic)
133 variable "dynamic_value" {
134     type          = any
135     description = "A variable that can accept any data type"
136     default       = null
137 }
138
139 # Output merged server tags
140 output "optional_tag" {
```

```
2 }
3 locals {
4     server_tags = merge(
5         { Name = "web-server" },
6         var.optional_tag != null ? { Custom = var.optional_tag } : {}
7     )
8 }
9
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  bash + - [ ] [x] ... | [ ] [x] X

@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
}
subnet_cidr_block_output = "10.0.30.0/24"
subnet_count = 3
tags = tomap({
  "Environment" = "dev"
  "Owner" = "platform-team"
  "Project" = "sample-app"
})
@23-22411-027-max →/workspaces/LAB11CC (main) $

Ln 20, Col 1  Spaces: 4  UTF-8  L

@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
4,
true,
]
}
optional_tag = {
  "Custom" = "dev"
  "Name" = "web-server"
}
primary_public_subnet = "subnet-0abcd1234ef567890"

Ln 21, Col 1  Spaces:
```

```
@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
```

```
}  
subnet_cidr_block_output = "10.0.30.0/24"  
subnet_count = 3  
tags = tomap({  
  "Environment" = "dev"  
  "Owner" = "platform-team"  
  "Project" = "sample-app"  
})
```

```
@23-22411-027-max →/workspaces/LAB11CC (main) $
```

LAB11CC [codespaces: congenial space nestor] 1 21 0 14 0 0 4 11

main.tf

locals.tf

terraform.tfvars ×

terraform.tfvars

```
11 }  
12  
13 server_config = {  
14   name          = "web-server"  
15   instance_type = "t3.micro"  
16   monitoring    = true  
17   storage_gb    = 20  
18   backup_enabled = false  
19 }  
20 optional_tag = "dev"  
21 dynamic_value = "hello"  
22
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  bash + v [ ] [ ] ...

@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
subnet_cidr_block_output = "10.0.30.0/24"
subnet_count = 3
tags = tomap({
  "Environment" = "dev"
  "Owner" = "platform-team"
  "Project" = "sample-app"
})
value_received = "hello"
@23-22411-027-max →/workspaces/LAB11CC (main) $ █

0 0 Ln 22, Col 1 Spaces: 4
terraform.tfvars
12
13   server_config = {
14       name          = "web-server"
15       instance_type = "t3.micro"
16       monitoring    = true
17       storage_gb    = 20
18       backup_enabled = false
19   }
20   optional_tag = "dev"
21   #dynamic_value = "hello"
22   dynamic_value = 42
23
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  bash + v [ ]

@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
subnet_cidr_block_output = "10.0.30.0/24"
subnet_count = 3
tags = tomap({
  "Environment" = "dev"
  "Owner" = "platform-team"
  "Project" = "sample-app"
})
value_received = 42
@23-22411-027-max →/workspaces/LAB11CC (main) $ █
```

main.tf locals.tf terraform.tfvars ×

terraform.tfvars

13 server_config = {
17 storage_gb = 20
18 backup_enabled = false
19 }
20 optional_tag = "dev"
21 #dynamic_value = "hello"
22 #dynamic_value = 42
23 dynamic_value = ["a", "b", "c"]
24

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash + - [] [] ...

@23-22411-027-max → /workspaces/LAB11CC (main) \$ terraform apply -auto-approve
"Owner" = "platform-team"
"Project" = "sample-app"
})
value_received = [
"a",
"b",
"c",
]

main.tf

locals.tf

terraform.tfvars ×

terraform.tfvars

```
13  server_config = {
18    backup_enabled = false
19  }
20  optional_tag = "dev"
21  #dynamic_value = "hello"
22  #dynamic_value = 42
23  #dynamic_value = ["a", "b", "c"]
24  dynamic_value = {
25    name = "server"
26    cpu  = 4
27  }
28
```

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

bash + ▾

...

@23-22411-027-max →/workspaces/LAB11CC (main) \$ terraform apply -auto-approve

```
"Environment" = "dev"
"Owner" = "platform-team"
"Project" = "sample-app"
})
value_received = {
  "cpu" = 4
  "name" = "server"
}
```

③ @23-22411-027-max →/workspaces/LAB11CC (main) \$

LAB11CC [Codespaces: congenial space fiesta]

main.tf U locals.tf U terraform.tfvars U X

.SPACE FIESTA]

terraform.tfvars

```
15 server_config = {
19 }
20 optional_tag = "dev"
21 #dynamic_value = "hello"
22 #dynamic_value = 42
23 #dynamic_value = ["a", "b", "c"]
24 #dynamic_value = {
25   #name = "server"
26   #cpu = 4
27 #}
28 dynamic_value = null
29
30
```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

@23-22411-027-max → /workspaces/LAB11CC (main) \$ terraform apply -auto-approve

```
}
subnet_cidr_block_output = "10.0.30.0/24"
subnet_count = 3
tags = tomap({
  "Environment" = "dev"
  "Owner" = "platform-team"
  "Project" = "sample-app"
})
```

@23-22411-027-max → /workspaces/LAB11CC (main) \$

Ln 29, Col 1 Spaces: 4 UTF-8 LF {} Plain Text

CHAT

Generate

SUGGESTED

Build Wor

Describe v

Agent v

TASK7

main.tf U

locals.tf U

terraform.tfvars

.gitignore U X

.gitignore

1 .terraform/*

2 *.tfstate

3 *.tfstate.*

4 *.tfvars

5 *.pem

6

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

bash + v

...

@23-22411-027-max →/workspaces/LAB11CC (main) \$ terraform apply -auto-approve

})

• @23-22411-027-max →/workspaces/LAB11CC (main) \$ touch .gitignore

• @23-22411-027-max →/workspaces/LAB11CC (main) \$ cat .gitignore

.terraform/*

*.tfstate

.tfstate.

*.tfvars

*.pem

○ @23-22411-027-max →/workspaces/LAB11CC (main) \$

0

0

Ln 6, Col 1

Spaces: 4

U

TASK 8

main.tf U × locals.tf U terraform.tfvars .gitignore U

main.tf

```
1 provider "aws" {
2   shared_config_files      = ["~/.aws/config"]
3   shared_credentials_files = ["~/.aws/credentials"]
4 }
5 |
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash + v [] [] ... []

- @23-22411-027-max → /workspaces/LAB11CC (main) \$ touch .gitignore
- @23-22411-027-max → /workspaces/LAB11CC (main) \$ cat .gitignore
.terraform/*
*.tfstate
.tfstate.
*.tfvars
*.pem
- @23-22411-027-max → /workspaces/LAB11CC (main) \$ > terraform.tfvars
> locals.tf
- @23-22411-027-max → /workspaces/LAB11CC (main) \$ []

main.tf U × locals.tf U terraform.tfvars .gitignore U

main.tf

```
4 }
5 variable "vpc_cidr_block" {}
6 variable "subnet_cidr_block" {}
7 variable "availability_zone" {}
8 variable "env_prefix" {}
9 resource "aws_vpc" "myapp_vpc" {
10   cidr_block = var.vpc_cidr_block
11   tags = {
12     Name = "${var.env_prefix}-vpc"
13   }
14 }
15 resource "aws_subnet" "myapp_subnet_1" {
16   vpc_id      = aws_vpc.myapp_vpc.id
17   cidr_block   = var.subnet_cidr_block
18   availability_zone = var.availability_zone
19   tags = {
```

main.tf U locals.tf U terraform.tfvars X .gitignore U

terraform.tfvars

1 vpc_cidr_block = "10.0.0.0/16"

2 subnet_cidr_block = "10.0.10.0/24"

3 availability_zone = "me-central-1a"

4 env_prefix = "dev"

5

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

@23-22411-027-max →/workspaces/LAB11CC (main) \$ terraform init

terraform apply -auto-approve

- subnet_cidr_block_output = "10.0.30.0/24" -> null

- subnet_count = 3 -> null

- tags = {

- Environment = "dev"

- Owner = "platform-team"




- Project = "sample-app"

} -> null

aws_vpc.myapp_vpc: Creating...

```
} -> null
aws_vpc.myapp_vpc: Creating...
aws_vpc.myapp_vpc: Creation complete after 1s [id=vpc-090c7f501293f0384]
aws_subnet.myapp_subnet_1: Creating...
aws_subnet.myapp_subnet_1: Creation complete after 1s [id=subnet-08ce7fb98a2f88d85]
```

```
023-22411-027-max → /workspaces/1AR11CC (main) $
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS  bash     ..

```
Plan: 2 to add, 0 to change, 0 to destroy.
aws_internet_gateway.myapp_igw: Creating...
aws_internet_gateway.myapp_igw: Creation complete after 0s [id=igw-07a16de195e0285de]
aws_route_table.myapp_route_table: Creating...
aws_route_table.myapp_route_table: Creation complete after 0s [id=rtb-0384ca0ebbb556f04]
```

```
@23-22411-027-max → /workspaces/LAB11CC (main) $
```

```

}
resource "aws_route_table_association" "a_rtb_subnet" {
  subnet_id      = aws_subnet.myapp_subnet_1.id
  route_table_id = aws_route_table.myapp_route_table.id
}

```

@23-22411-027-max →/workspaces/LAB11CC (main) \$ terraform apply -auto-approve

Plan: 1 to add, 0 to change, 0 to destroy.

aws_route_table_association.a_rtb_subnet: Creating...

aws_route_table_association.a_rtb_subnet: Creation complete after 1s [id=rtbassoc-07e9162144fd6178c]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

@23-22411-027-max →/workspaces/LAB11CC (main) \$

0 0

Ln 46, Col 1 Spaces: 2 UTF-8

main.tf U ×

locals.tf U

terraform.tfvars

.gitignore U



main.tf

```

30 resource "aws_route_table" "myapp_route_table" {
38   tags = {
40   }
41 }
42 resource "aws_route_table_association" "a_rtb_subnet" {
43   subnet_id      = aws_subnet.myapp_subnet_1.id
44   route_table_id = aws_route_table.myapp_route_table.id
45 }
46 resource "aws_default_route_table" "main_rt" {
47   default_route_table_id = aws_vpc.myapp_vpc.default_route_table_id
48
49   route {
50     cidr_block = "0.0.0.0/0"
51     gateway_id = aws_internet_gateway.myapp_igw.id
52   }
53 }

```

main.tf:30:1: resource "aws_route_table" "myapp_route_table" {
main.tf:38:1: tags = {
main.tf:40:1: }
main.tf:41:1: }
main.tf:42:1: resource "aws_route_table_association" "a_rtb_subnet" {
main.tf:43:1: subnet_id = aws_subnet.myapp_subnet_1.id
main.tf:44:1: route_table_id = aws_route_table.myapp_route_table.id
main.tf:45:1: }
main.tf:46:1: resource "aws_default_route_table" "main_rt" {
main.tf:47:1: default_route_table_id = aws_vpc.myapp_vpc.default_route_table_id
main.tf:48:1:
main.tf:49:1: route {
main.tf:50:1: cidr_block = "0.0.0.0/0"
main.tf:51:1: gateway_id = aws_internet_gateway.myapp_igw.id
main.tf:52:1: }
main.tf:53:1: }

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

PORTS

bash + v [] [] ... []

```
@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
+ vpc_id = (known after apply)
}
```

Plan: 1 to add, 0 to change, 0 to destroy.

aws_default_route_table.main_rt: Creating...

aws_default_route_table.main_rt: Creation complete after 1s [id=rtb-07f30d7cd73903b86]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

```
@23-22411-027-max →/workspaces/LAB11CC (main) $
```

Ln 58, Col 1 Spaces: 2 UTI

TASK 9



The screenshot shows a code editor with four tabs: main.tf, locals.tf, terraform.tfvars, and .gitignore. The main.tf tab is active, displaying the following code:

```
46 resource "aws_default_route_table" "main_rt" {
54     tags = {
56     }
57 }
58 variable "my_ip" {}
59
```

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

- @23-22411-027-max →/workspaces/LAB11CC (main) \$ curl icanhazip.com
20.192.21.52
- @23-22411-027-max →/workspaces/LAB11CC (main) \$

main.tf locals.tf terraform.tfvars X .gitignore

terraform.tfvars

```
1 vpc_cidr_block = "10.0.0.0/16"
2 subnet_cidr_block = "10.0.10.0/24"
3 availability_zone = "me-central-1a"
4 env_prefix = "dev"
5 my_ip = "20.192.21.52/32"
6 instance_type = "t3.micro"
7 availability_zone = "me-central-1a"
8 env_prefix = "dev"
9
```

main.tf

```
59 resource "aws_default_security_group" "myapp_sg" {
60
61
62     ingress {
63         from_port = 22
64         to_port   = 22
65         protocol  = "tcp"
66         cidr_blocks = [var.my_ip]
67     }
68
69     ingress {
70         from_port = 80
71         to_port   = 80
72         protocol  = "tcp"
73         cidr_blocks = ["0.0.0.0/0"]
74     }
75
76     egress {
77         from_port = 0
78         to_port   = 0
79         protocol  = "all"
80         cidr_blocks = ["0.0.0.0/0"]
81     }
82 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash + v [] [] ... | [] [] X

@23-22411-027-max → /workspaces/LAB11CC (main) \$ terraform apply -auto-approve

configuration.

To silence these warnings, use TF_VAR_... environment variables to provide certain "global" settings to all configurations in your organization. To reduce the verbosity of these warnings, use the -compact-warnings option.

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

@23-22411-027-max → /workspaces/LAB11CC (main) \$

, 0 0

Ln 8, Col 2 Spaces: 4 UTF-8

main.tf × locals.tf terraform.tfvars .gitignore

main.tf

```
59 resource "aws_default_security_group" "myapp_sg" {
83     tags = {
84         Name = "${var.env_prefix}-sg"
85     }
86 }
87 variable "instance_type" {}
88 resource "aws_instance" "myapp-server" {
89     ami                = "ami-05524d6658fcf35b6" # Amazon Linux 2
90     instance_type      = var.instance_type
91     subnet_id          = aws_subnet.myapp_subnet_1.id
92     security_groups    = [aws_default_security_group.myapp_sg.id]
93     availability_zone   = var.availability_zone
94     associate_public_ip_address = true
95     key_name            = "MyED25519Key"
96
97 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash + v [] [] ...

@23-22411-027-max → /workspaces/LAB11CC (main) \$ terraform apply -auto-approve

aws_instance.myapp-server: Still creating... [00m10s elapsed]

aws_instance.myapp-server: Creation complete after 13s [id=i-0ced5a19367a5b414]

Apply complete! Resources: 1 added, 0 changed, 0 destroyed.

Outputs:

aws_instance_public_ip = "40.172.113.216"

@23-22411-027-max → /workspaces/LAB11CC (main) \$

, 0 0

Ln 87, Col 29 Spaces: 2

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  TEMPLATES  FILES  TESTS  SETTINGS  COMMANDS  HELP  ?
~#/?  https://aws.amazon.com/linux/amazon-linux-2023
~#/?  V~'  ->
~#/?  /
~#/?  /m/

Last login: Thu Jan 1 19:36:04 2026 from 20.192.21.52
[ec2-user@ip-10-0-10-158 ~]$
```

```
~#/?  https://aws.amazon.com/linux/amazon-linux-2023
~#/?  V~'  ->
~#/?  /
~#/?  /m/

Last login: Thu Jan 1 19:36:04 2026 from 20.192.21.52
[ec2-user@ip-10-0-10-158 ~]$ exit
```

Explore and understand your code

Auto v →

```
• @23-22411-027-max → /workspaces/LAB11CC (main) $ ssh-keygen -t ed25519 -f ~/.ssh/id_ed25519 -N ""

Generating public/private ed25519 key pair.
/home/codespace/.ssh/id_ed25519 already exists.
Overwrite (y/n)? yes
Your identification has been saved in /home/codespace/.ssh/id_ed25519
Your public key has been saved in /home/codespace/.ssh/id_ed25519.pub
The key fingerprint is:
```

Explore and understand your code




Auto v →

main.tf U × locals.tf U terraform.tfvars .gitignore

```
main.tf
103
104 output "aws_instance_public_ip" {
105   value = aws_instance.myapp-server.public_ip
106 }
107 resource "aws_key_pair" "ssh_key" {
108   key_name    = "serverkey"
109   public_key  = file("~/ssh/id_ed25519.pub")
110 }
111 key_name = aws_key_pair.ssh_key.key_name
112
```


110 }

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

 bash + ▾   ...

aws_instance.myapp-server: Creation complete after 12s [id=i-0a1e9d0e9464899c1]

Apply complete! Resources: 1 added, 0 changed, 1 destroyed.

Outputs:

aws_instance_public_ip = "3.29.27.207"

○ @23-22411-027-max → /workspaces/LAB11CC (main) \$

Explore and understand your code

Auto ▾

service --status-all

○ @23-22411-027-max → /workspaces/LAB11CC (main) \$ ^C

● @23-22411-027-max → /workspaces/LAB11CC (main) \$ chmod 600 MyED25519Key.pem

○ @23-22411-027-max → /workspaces/LAB11CC (main) \$ ssh -i /path/to/MyED25519Key.pem ec2-user@3.29.27.207

⚠ Not secure 3.29.27.207

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

```
associate_public_ip_address = true

key_name = aws_key_pair.ssh_key.key_name

user_data = file("entry-script.sh")

tags = {
  Name = "${var.env_prefix}-ec2-instance"
}
```

```

@23-22411-027-max →/workspaces/LAB11CC (main) $ cat > entry-script.sh <<'EOF'
#!/bin/bash
yum update -y
yum install -y nginx
systemctl start nginx
systemctl enable nginx
EOF
@23-22411-027-max →/workspaces/LAB11CC (main) $

```

```

98 user_data = file("entry-script.sh")
99
100 tags = {
101 |   Name = "${var.env_prefix}-ec2-instance"
102 | }
103 }
104
105 output "aws_instance_public_ip" {
106 |   value = aws_instance.myapp-server.public_ip
107 | }
108 resource "aws_key_pair" "ssh_key" {
109 |   key_name   = "converkey"

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

bash + v [] [] ... []

```

@23-22411-027-max →/workspaces/LAB11CC (main) $ terraform apply -auto-approve
aws_instance.myapp-server: Still creating... [00m10s elapsed]
aws_instance.myapp-server: Creation complete after 13s [id=i-0349129bb18670e3f]

```

Apply complete! Resources: 1 added, 0 changed, 1 destroyed.

Outputs:

aws_instance_public_ip = "3.29.50.125"

```

@23-22411-027-max →/workspaces/LAB11CC (main) $

```

0

Ln 98, Col 38 Spaces: 2 UT

Cleaning

@23-22411-027-max → /workspaces/LAB11CC (main) \$ terraform destroy -auto-approve

```
aws_internet_gateway.myapp_igw: Destroying... [id=igw-07a16de195e0285de]
aws_instance.myapp-server: Still destroying... [id=i-0349129bb18670e3f, 00m10s elapsed]
aws_internet_gateway.myapp_igw: Still destroying... [id=igw-07a16de195e0285de, 00m10s elapsed]
aws_instance.myapp-server: Still destroying... [id=i-0349129bb18670e3f, 00m20s elapsed]
aws_internet_gateway.myapp_igw: Still destroying... [id=igw-07a16de195e0285de, 00m20s elapsed]
aws_instance.myapp-server: Still destroying... [id=i-0349129bb18670e3f, 00m30s elapsed]
aws_internet_gateway.myapp_igw: Still destroying... [id=igw-07a16de195e0285de, 00m30s elapsed]
aws_instance.myapp-server: Still destroying... [id=i-0349129bb18670e3f, 00m40s elapsed]
aws_internet_gateway.myapp_igw: Still destroying... [id=igw-07a16de195e0285de, 00m40s elapsed]
aws_instance.myapp-server: Still destroying... [id=i-0349129bb18670e3f, 00m50s elapsed]
aws_internet_gateway.myapp_igw: Still destroying... [id=igw-07a16de195e0285de, 00m50s elapsed]
aws_internet_gateway.myapp_igw: Destruction complete after 58s
aws_instance.myapp-server: Still destroying... [id=i-0349129bb18670e3f, 01m00s elapsed]
aws_instance.myapp-server: Destruction complete after 1m1s
aws_key_pair.ssh_key: Destroying... [id=serverkey]
aws_subnet.myapp_subnet_1: Destroying... [id=subnet-08ce7fb98a2f88d85]
aws_default_security_group.myapp_sg: Destroying... [id=sg-08fc31a598af17ccf]
aws_default_security_group.myapp_sg: Destruction complete after 0s
aws_key_pair.ssh_key: Destruction complete after 0s
aws_subnet.myapp_subnet_1: Destruction complete after 1s
aws_vpc.myapp_vpc: Destroying... [id=vpc-090c7f501293f0384]
aws_vpc.myapp_vpc: Destruction complete after 1s
```

Destroy complete! Resources: 9 destroyed.

@23-22411-027-max → /workspaces/LAB11CC (main) \$

```
@23-22411-027-max →/workspaces/LAB11CC (main) $ cat terraform.tfstate
cat terraform.tfstate.backup
```

```
    "owner_id": "212208750468",
    "region": "me-central-1",
    "tags": {
      "Name": "dev-vpc"
    },
    "tags_all": {
      "Name": "dev-vpc"
    }
  },
  "sensitive_attributes": [],
  "identity_schema_version": 0,
  "identity": {
    "account_id": "212208750468",
    "id": "vpc-090c7f501293f0384",
    "region": "me-central-1"
  },
  "private": "eyJzY2h1bWVfdmVyc2lvbiI6IjEifQ=="
}
]
}
],
"check_results": null
}
```

```
○ @23-22411-027-max →/workspaces/LAB11CC (main) $
```

```
}
● @23-22411-027-max →/workspaces/LAB11CC (main) $ git status
On branch main
Your branch is up to date with 'origin/main'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)
  .gitignore
  .terraform.lock.hcl
  aws/
  awscliv2.zip
  entry-script.sh
  locals.tf
  main.tf
```