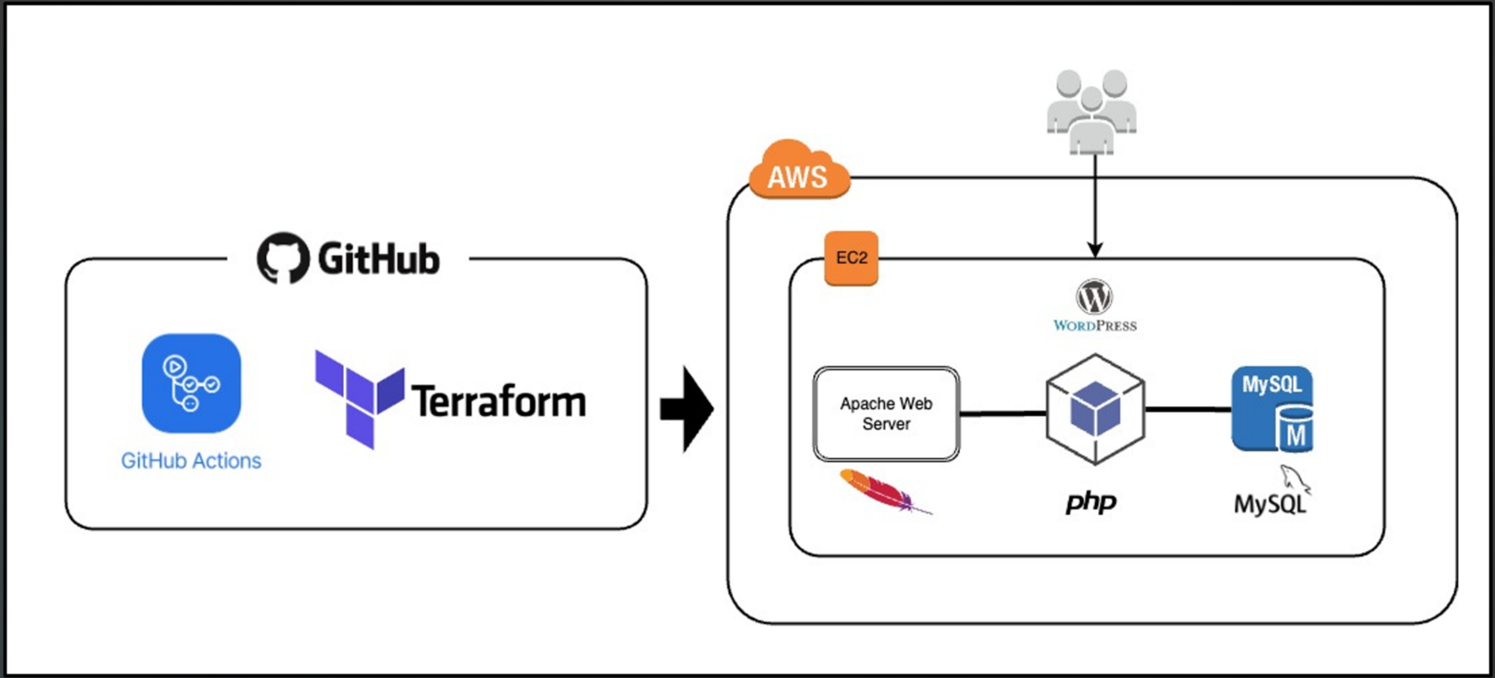
GitHub Actions and WordPress

Engineering Cloud Software Systems

Department of Software Engineering
Rochester Institute of Technology

Overview

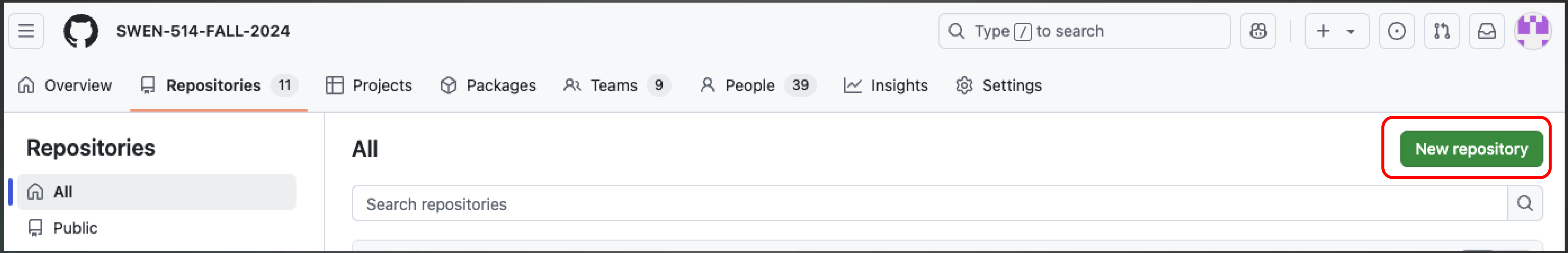
- In this activity, you will set up GitHub actions to run Terraform on a GitHub-hosted runner
- You will use your WordPress code from your previous activities



- There is 1 deliverable for this activity, which is worth 2 points plus an opportunity for an additional bonus point

Create a Repository

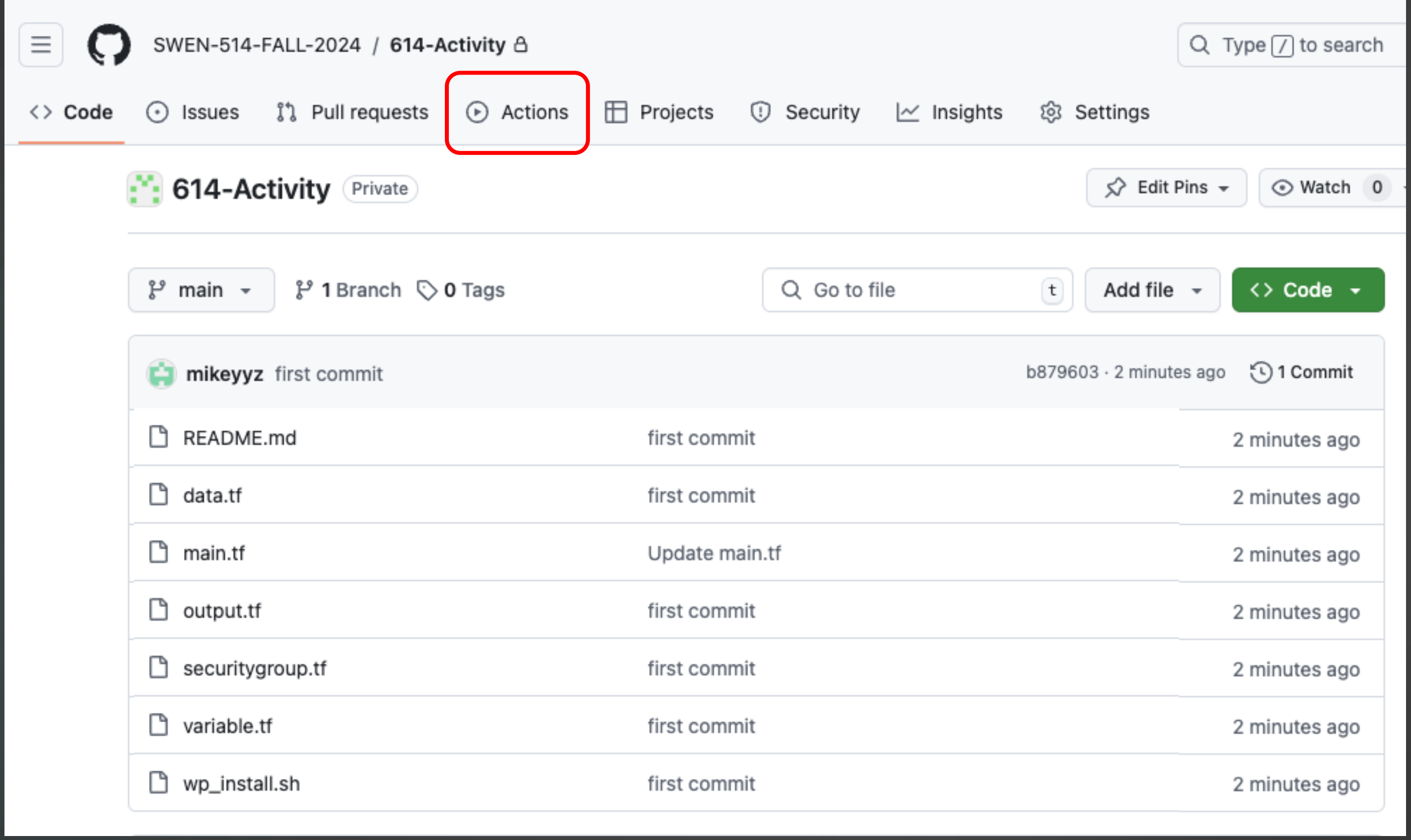
- Using your GitHub account, click "New repository" to create a new repository



- Follow the steps to upload your code from the Terraform and WordPress activity
- Note this is the activity that does not use RDS

Create a Repository

- Once your code has been added to the repository, click "Actions"



SWEN-514-FALL-2024 / 614-Activity

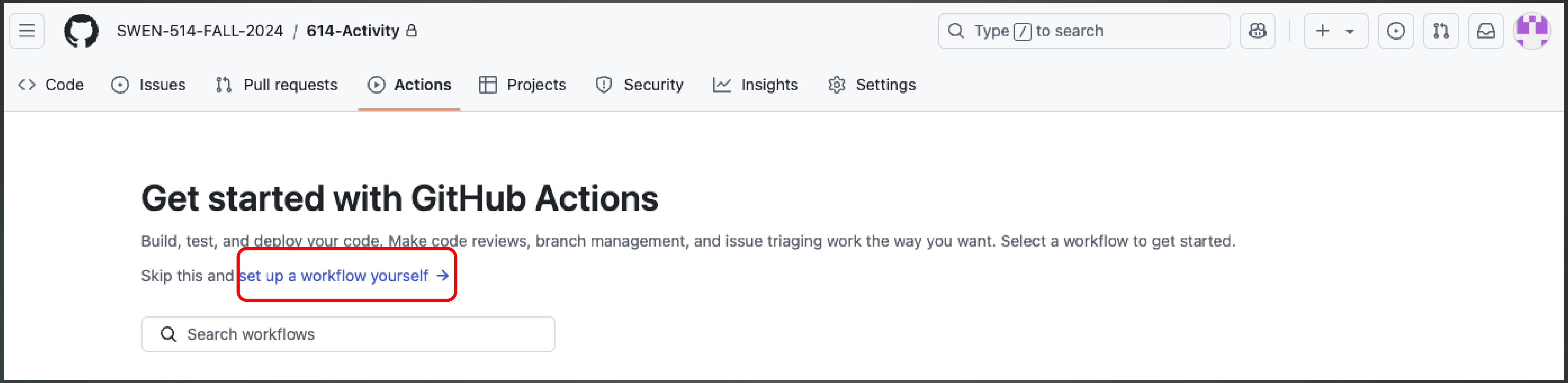
614-Activity

mikeyyz first commit b879603 · 2 minutes ago 1 Commit

README.md	first commit	2 minutes ago
data.tf	first commit	2 minutes ago
main.tf	Update main.tf	2 minutes ago
output.tf	first commit	2 minutes ago
securitygroup.tf	first commit	2 minutes ago
variable.tf	first commit	2 minutes ago
wp_install.sh	first commit	2 minutes ago

Create a Repository

- We are going to set up a new Workflow so click “set up a workflow yourself”



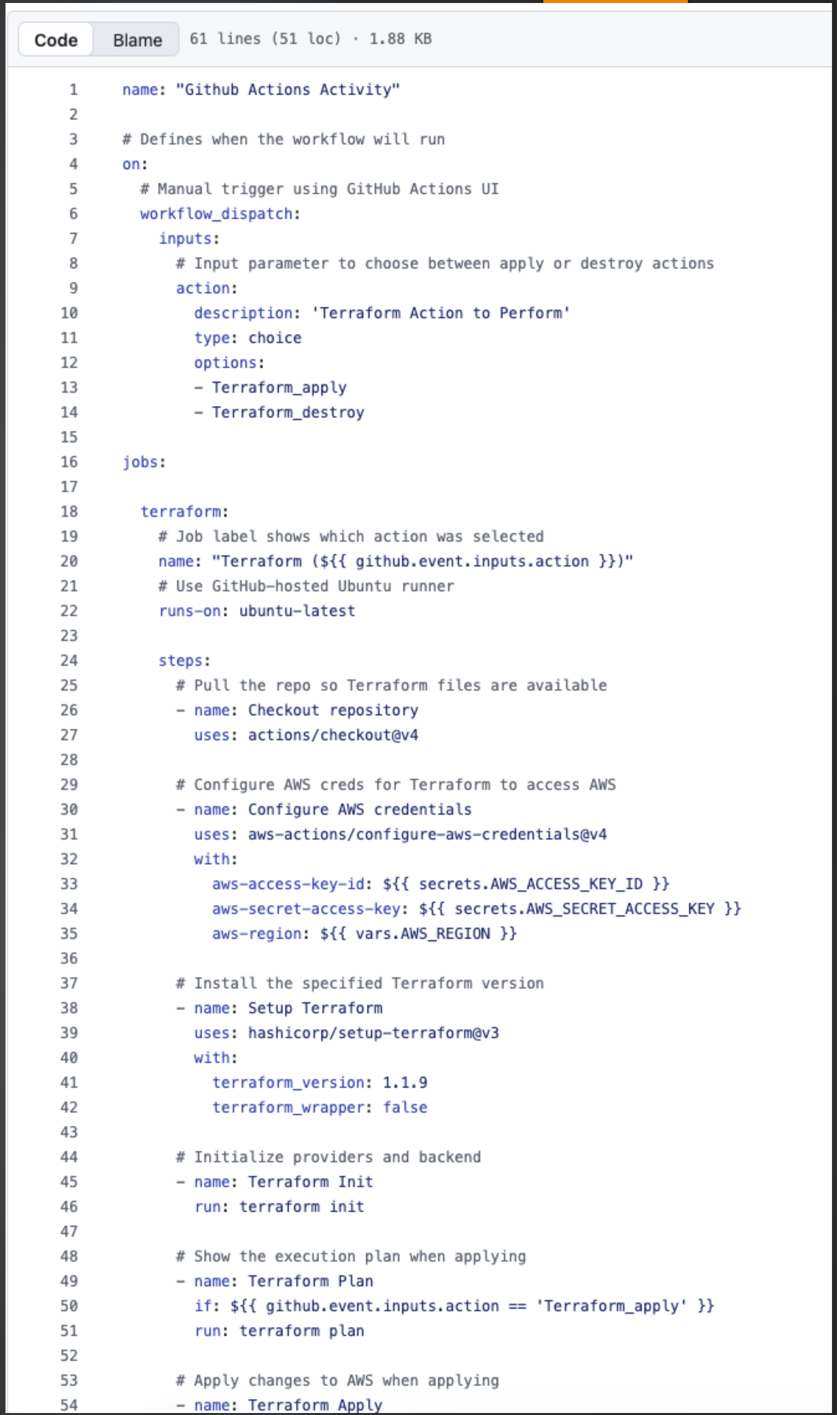
Get started with GitHub Actions

Build, test, and deploy your code. Make code reviews, branch management, and issue triaging work the way you want. Select a workflow to get started.

Skip this and set up a workflow yourself →

Create GitHub Action

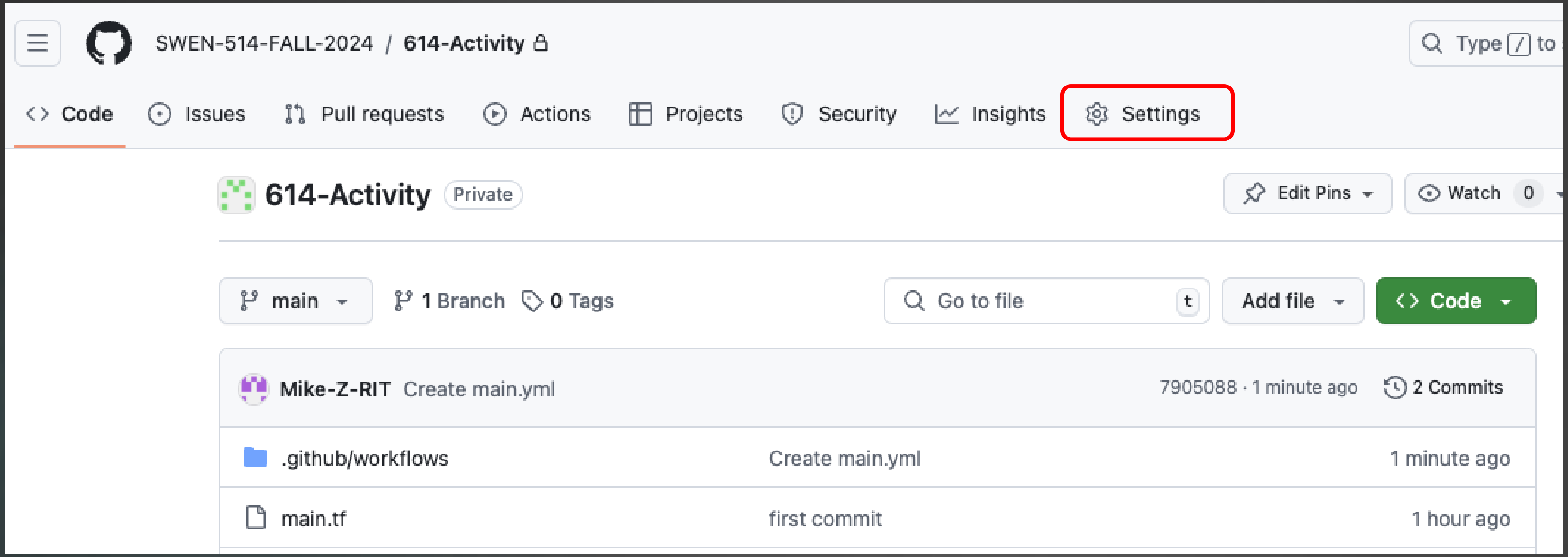
- Download the file Terraform-starter-code.yaml from Assignments > Activities – GitHub Actions and WordPress
- Paste the entire file as shown on the right
- Click "Commit changes" and click "Commit changes" again



```yaml
name: "Github Actions Activity"

# Defines when the workflow will run
on:
  # Manual trigger using GitHub Actions UI
  workflow_dispatch:
    inputs:
      # Input parameter to choose between apply or destroy actions
      action:
        description: 'Terraform Action to Perform'
        type: choice
        options:
        - Terraform_apply
        - Terraform_destroy

jobs:

  terraform:
    # Job label shows which action was selected
    name: "Terraform (${{ github.event.inputs.action }})"
    # Use GitHub-hosted Ubuntu runner
    runs-on: ubuntu-latest

    steps:
      # Pull the repo so Terraform files are available
      - name: Checkout repository
        uses: actions/checkout@v4

      # Configure AWS creds for Terraform to access AWS
      - name: Configure AWS credentials
        uses: aws-actions/configure-aws-credentials@v4
        with:
          aws-access-key-id: ${{ secrets.AWS_ACCESS_KEY_ID }}
          aws-secret-access-key: ${{ secrets.AWS_SECRET_ACCESS_KEY }}
          aws-region: ${{ vars.AWS_REGION }}

      # Install the specified Terraform version
      - name: Setup Terraform
        uses: hashicorp/setup-terraform@v3
        with:
          terraform_version: 1.1.9
          terraform_wrapper: false

      # Initialize providers and backend
      - name: Terraform Init
        run: terraform init

      # Show the execution plan when applying
      - name: Terraform Plan
        if: ${{ github.event.inputs.action == 'Terraform_apply' }}
        run: terraform plan

      # Apply changes to AWS when applying
      - name: Terraform Apply
```

Create GitHub Action

- Click the “Settings” on the menu

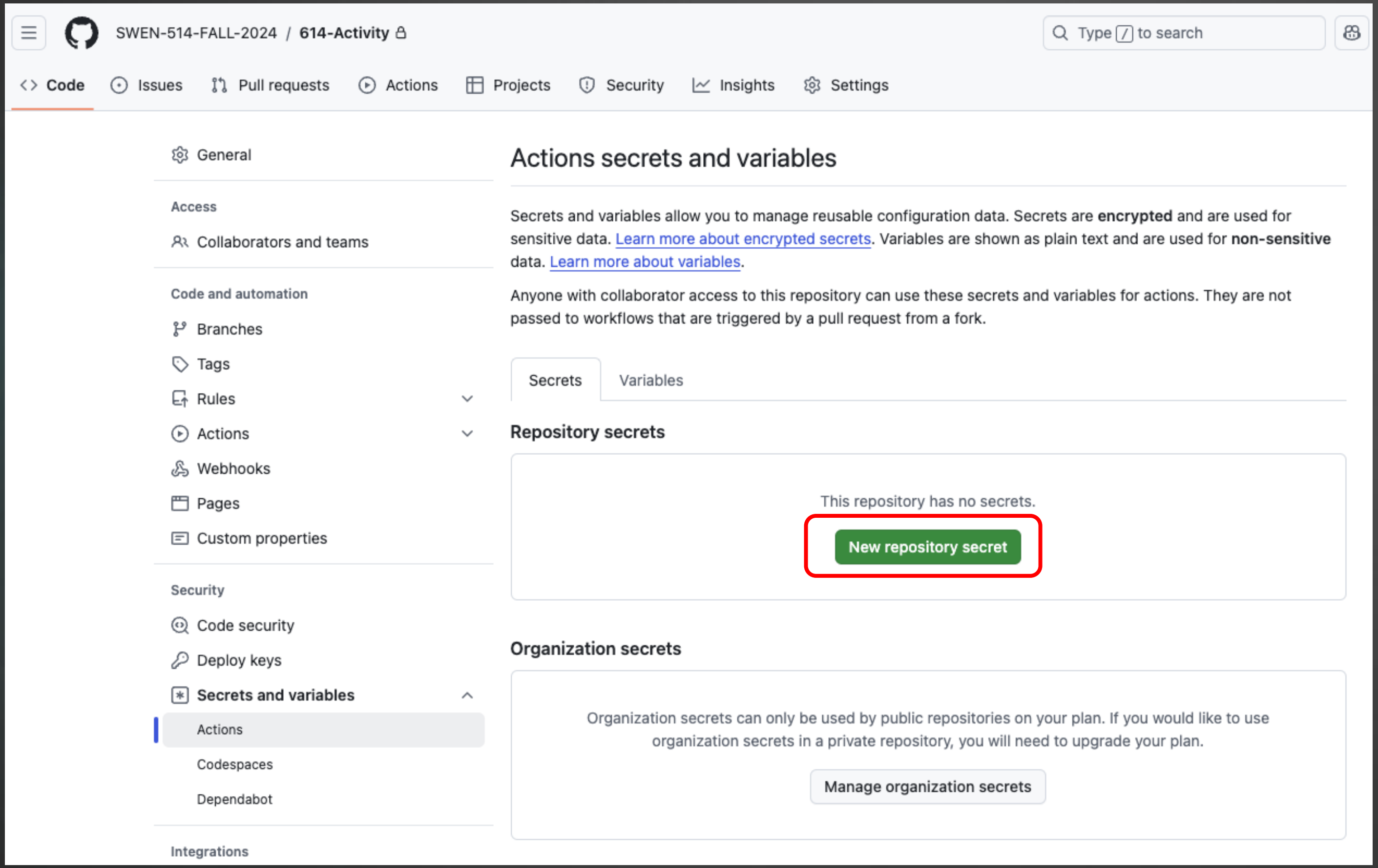


Mike-Z-RIT Create main.yml 7905088 · 1 minute ago

.github/workflows	Create main.yml	1 minute ago
main.tf	first commit	1 hour ago

Create Secret and Environment Variables

- You will need to add your AWS_ACCESS_KEY_ID and AWS_SECRET_ACCESS_KEY as secret variables
- Click “New Repository secret”



SWEN-514-FALL-2024 / 614-Activity

Actions secrets and variables

Secrets and variables allow you to manage reusable configuration data. Secrets are **encrypted** and are used for sensitive data. Learn more about encrypted secrets. Variables are shown as plain text and are used for **non-sensitive** data. Learn more about variables.

Anyone with collaborator access to this repository can use these secrets and variables for actions. They are not passed to workflows that are triggered by a pull request from a fork.

Repository secrets

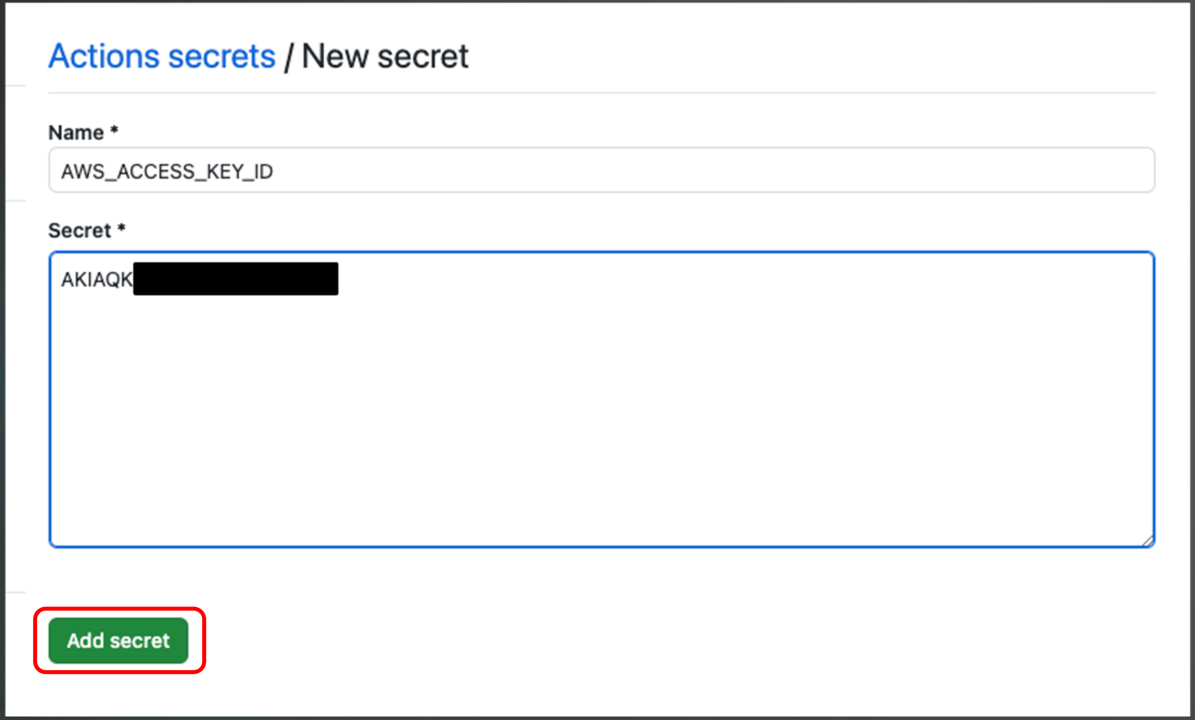
This repository has no secrets.

Organization secrets

Organization secrets can only be used by public repositories on your plan. If you would like to use organization secrets in a private repository, you will need to upgrade your plan.

Create Secret and Environment Variables

- For the name, enter AWS_ACCESS_KEY_ID
- Click "Add secret"



Actions secrets / New secret

Name *

AWS_ACCESS_KEY_ID

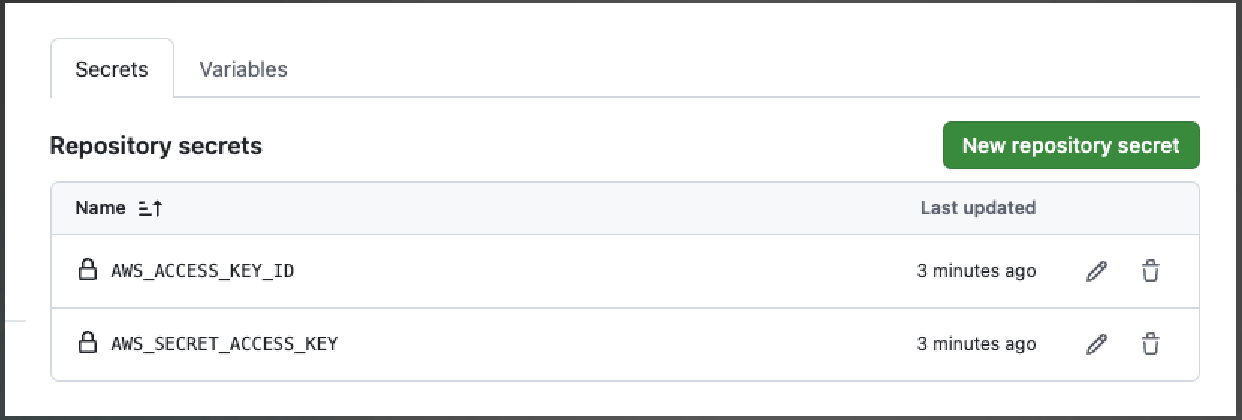
Secret *

AKIAQK[redacted]

- Repeat the same steps for AWS_SECRET_ACCESS_KEY
- Next, create an environment variable for AWS_REGION

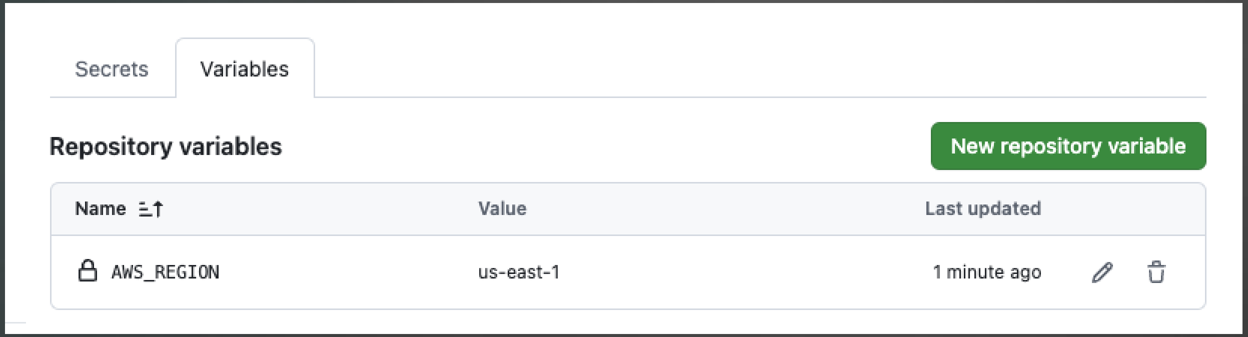
Create Secret and Environment Variables

- Verify the following variables have been created



Repository secrets

Name	Last updated
AWS_ACCESS_KEY_ID	3 minutes ago
AWS_SECRET_ACCESS_KEY	3 minutes ago



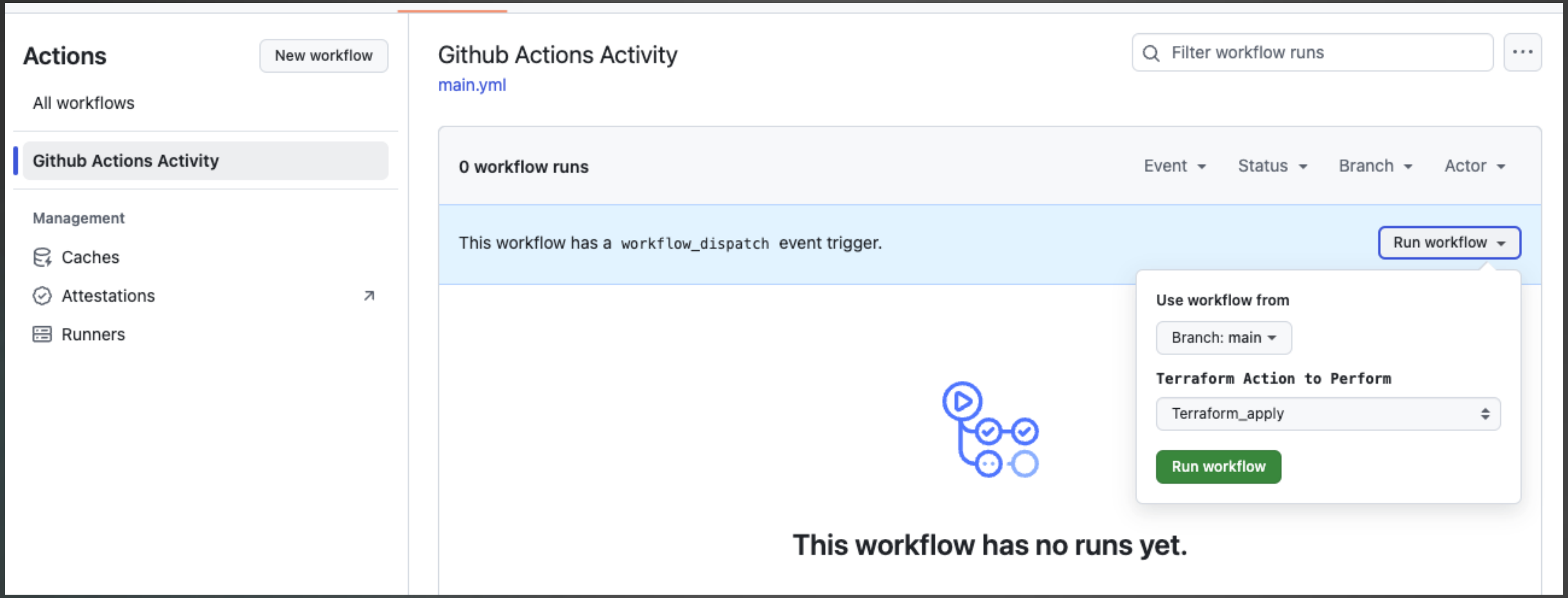
Repository variables

Name	Value	Last updated
AWS_REGION	us-east-1	1 minute ago

- Go back to your repository

Run your GitHub Action

- Click “Actions” in the top menu and you should see the screen below



This workflow has a `workflow_dispatch` event trigger.

Use workflow from

Branch: main

`Terraform Action to Perform`

Terraform_apply

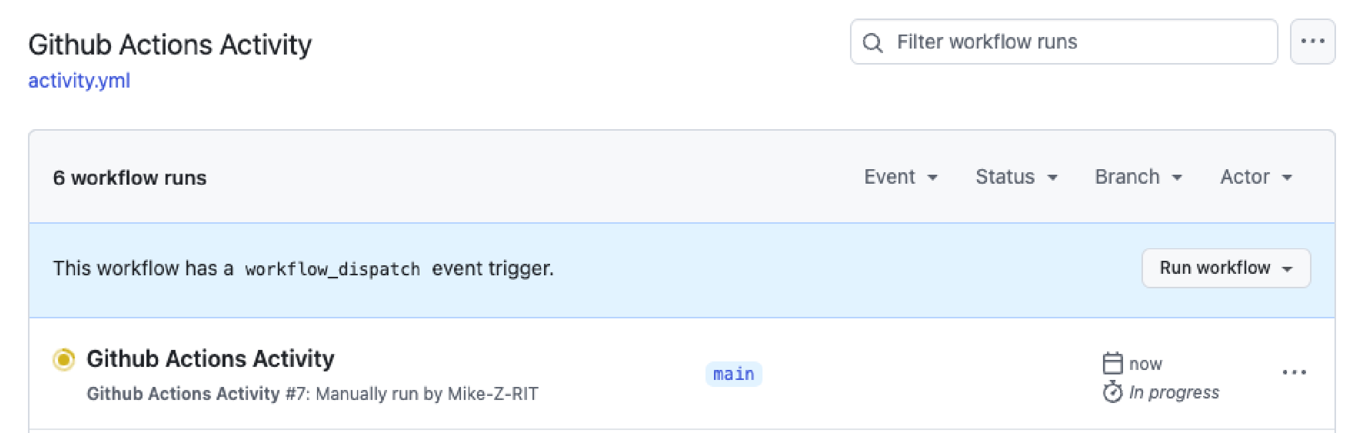
Run workflow

This workflow has no runs yet.

- Select “Run workflow” and the menu will appear
- Select “Terraform_apply” and click “Run workflow”

Run your GitHub Action

- Within a few seconds, your GitHub actions will run on a GitHub runner



Github Actions Activity
activity.yml

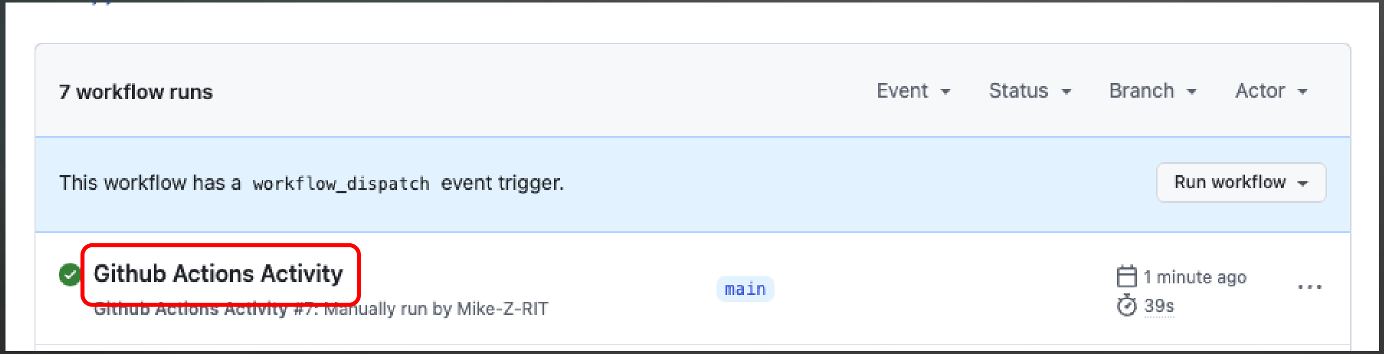
Filter workflow runs

6 workflow runs

This workflow has a `workflow_dispatch` event trigger.

Github Actions Activity
Github Actions Activity #7: Manually run by Mike-Z-RIT
main
now
In progress

- If you see a green check mark, it has completed
- Click the activity



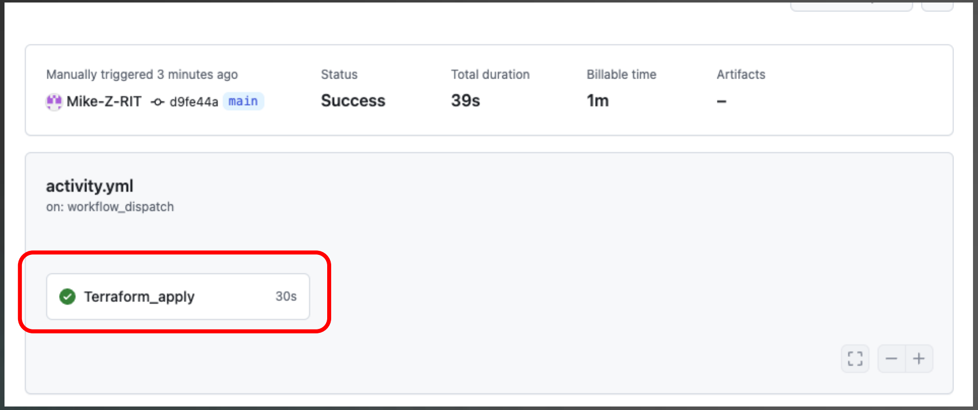
7 workflow runs

This workflow has a `workflow_dispatch` event trigger.

✓ Github Actions Activity
Github Actions Activity #7: Manually run by Mike-Z-RIT
main
1 minute ago
39s

Run your GitHub Action

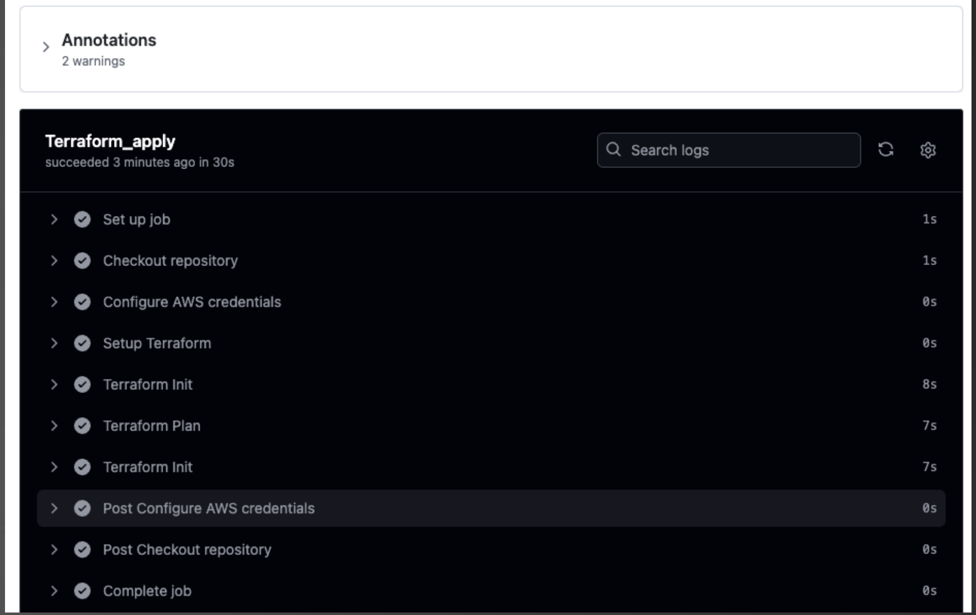
- Click the Terraform_apply



Manually triggered 3 minutes ago	Status	Total duration	Billable time	Artifacts
Mike-Z-RIT d9fe44a main	Success	39s	1m	–

activity.yml
on: workflow_dispatch

Terraform_apply 30s



Annotations
2 warnings

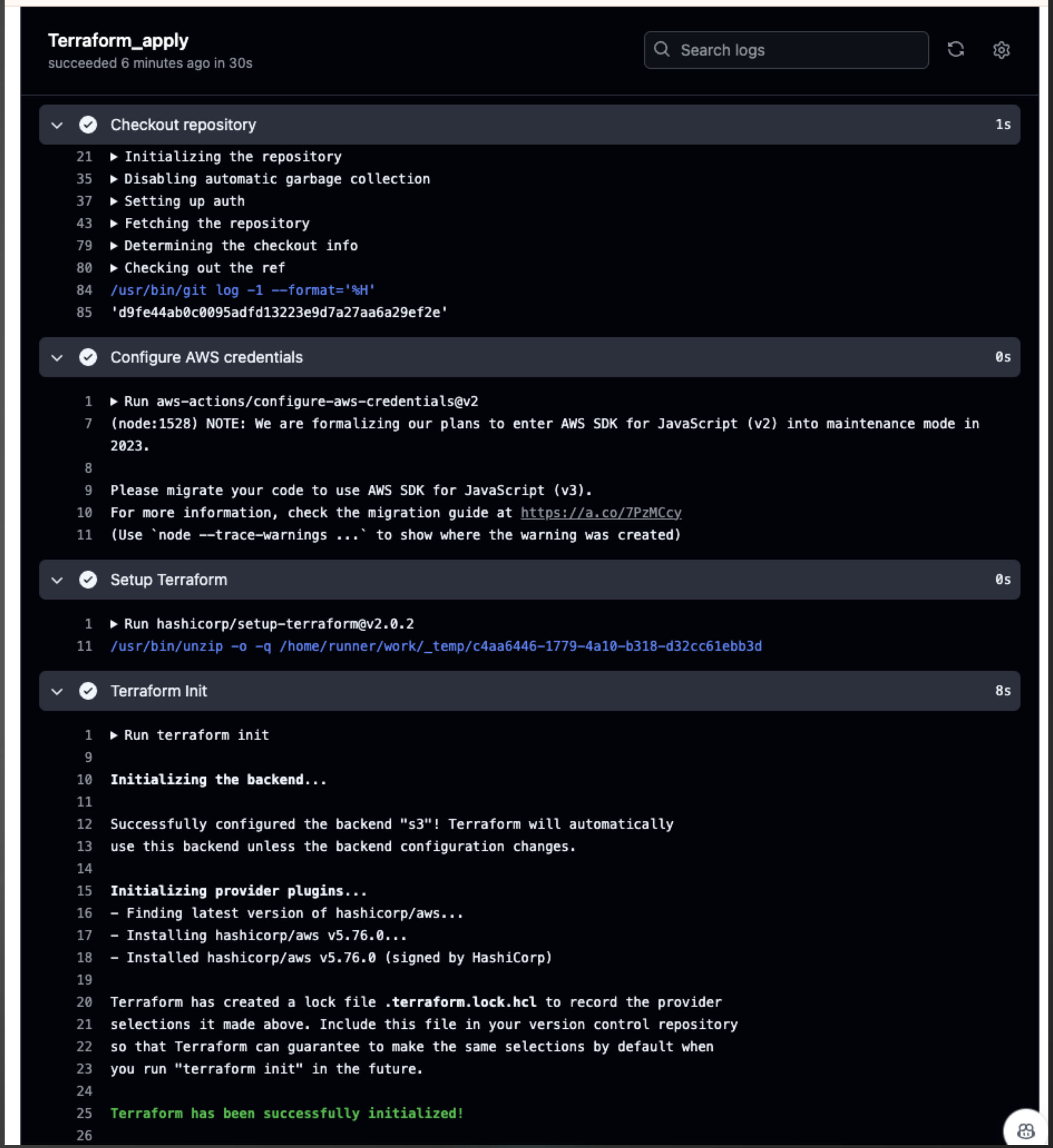
Terraform_apply
succeeded 3 minutes ago in 30s

Set up job	1s
Checkout repository	1s
Configure AWS credentials	0s
Setup Terraform	0s
Terraform Init	8s
Terraform Plan	7s
Terraform Init	7s
Post Configure AWS credentials	0s
Post Checkout repository	0s
Complete job	0s

- These are the results of all the steps in the GitHub Actions
- Click any of these to expand

Run your GitHub Action

- There is a lot of information that is displayed for each step
- This is particularly useful for debugging



Terraform_apply

succeeded 6 minutes ago in 30s

Checkout repository 1s

```
▶ Initializing the repository
▶ Disabling automatic garbage collection
▶ Setting up auth
▶ Fetching the repository
▶ Determining the checkout info
▶ Checking out the ref
/usr/bin/git log -1 --format='%H'
'd9fe44ab0c0095adfd13223e9d7a27aa6a29ef2e'
```

Configure AWS credentials 0s

```
▶ Run aws-actions/configure-aws-credentials@v2
(node:1528) NOTE: We are formalizing our plans to enter AWS SDK for JavaScript (v2) into maintenance mode in
2023.

Please migrate your code to use AWS SDK for JavaScript (v3).
For more information, check the migration guide at https://a.co/7PzMCcy
(Use `node --trace-warnings ...` to show where the warning was created)
```

Setup Terraform 0s

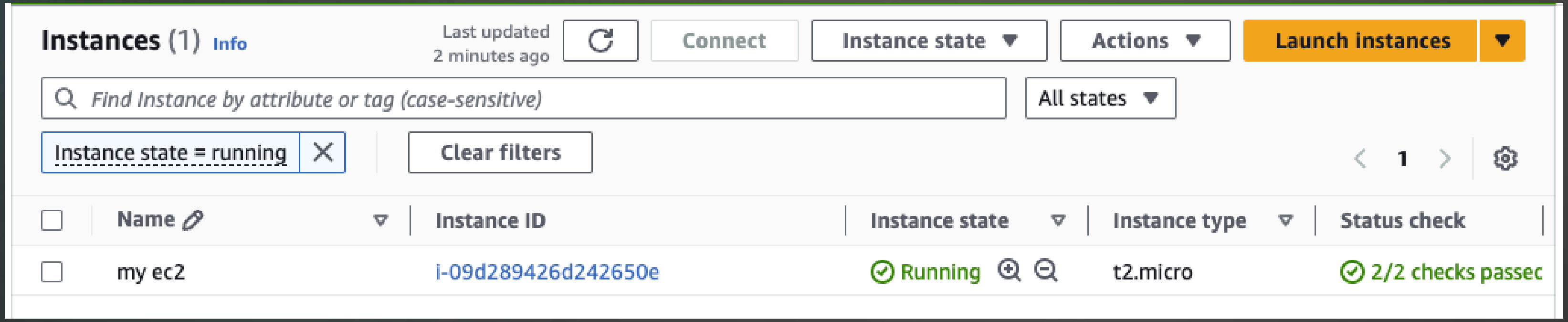
```
▶ Run hashicorp/setup-terraform@v2.0.2
/usr/bin/unzip -o -q /home/runner/work/_temp/c4aa6446-1779-4a10-b318-d32cc61ebb3d
```

Terraform Init 8s

```
▶ Run terraform init

Initializing the backend...

Successfully configured the backend "s3"! Terraform will automatically
use this backend unless the backend configuration changes.

Initializing provider plugins...
- Finding latest version of hashicorp/aws...
- Installing hashicorp/aws v5.76.0...
- Installed hashicorp/aws v5.76.0 (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!

```

Run your GitHub Action

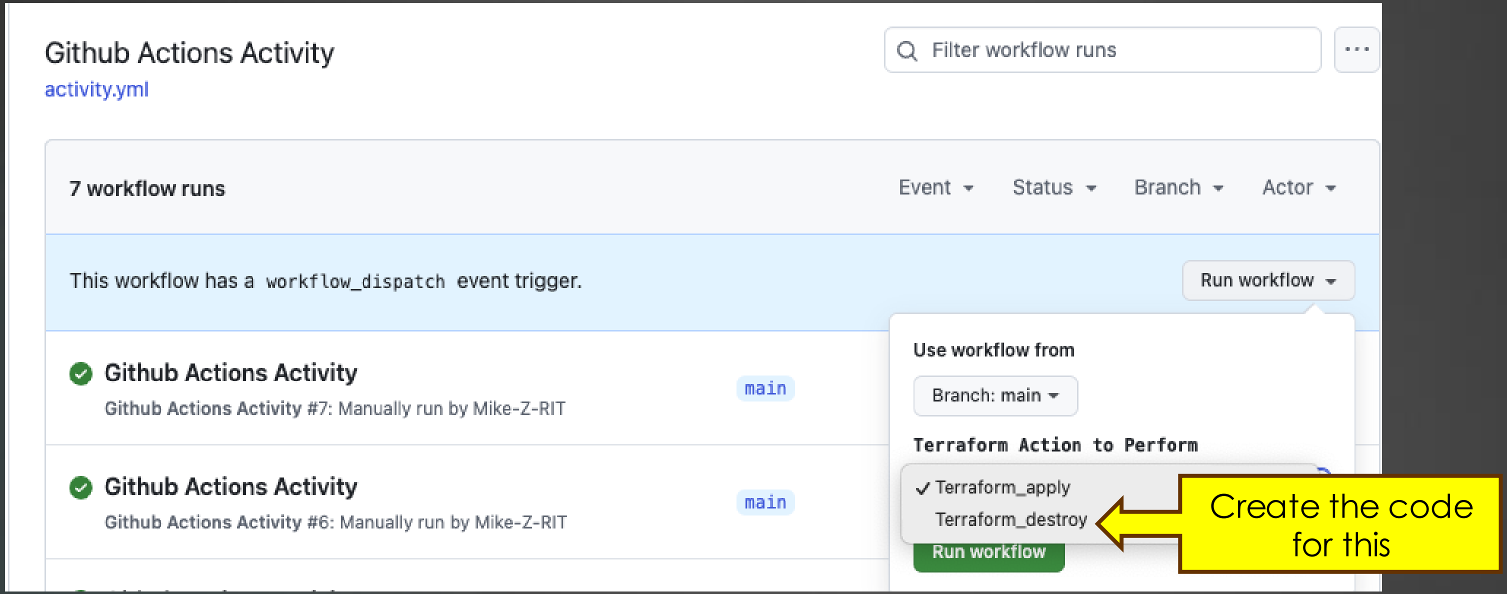
- You can run your GitHub action as many times as you want, but be aware that a new EC2 instance will be created each time
- If you are wondering how to destroy your EC2 instance you cannot do that yet
- You will need to go to the AWS Console and terminate your EC2 instances manually


Instances (1) Info
Last updated 2 minutes ago
Connect
Instance state ▼
Actions ▼
Launch instances ▼
Find Instance by attribute or tag (case-sensitive)
All states ▼
Instance state = running ✕
Clear filters
< 1 >

□	Name	Instance ID	Instance state	Instance type	Status check
□	my ec2	i-09d289426d242650e	✓ Running	t2.micro	✓ 2/2 checks passec

Assignment

- Create the corresponding “Terraform_destroy” in your GitHub workflow
- The code should be added to the the file that was provided



Github Actions Activity

activity.yml

7 workflow runs

This workflow has a `workflow_dispatch` event trigger.

Github Actions Activity — main

Github Actions Activity #7: Manually run by Mike-Z-RIT

Github Actions Activity — main

Github Actions Activity #6: Manually run by Mike-Z-RIT

Use workflow from

Branch: main

Terraform Action to Perform

✓ Terraform_apply

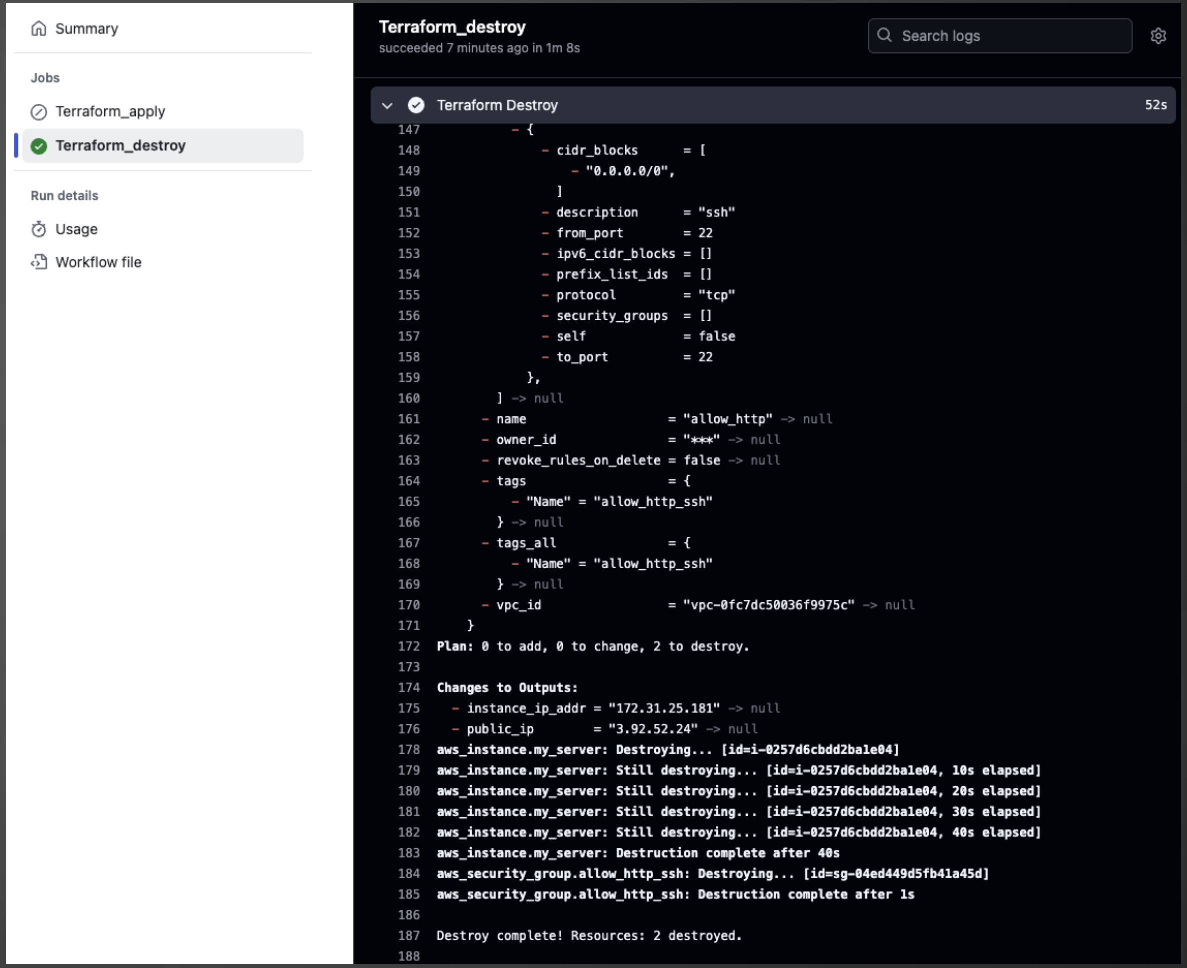
Terraform_destroy

Create the code for this

- Note: For this to work properly, you will need to use S3 to store the Terraform state so it can be retrieved for running Terraform destroy
  - You do not need to do anything for state locking
- Refer to the Advanced Terraform lecture for more details

Deliverable

- Take a screen shot of the **Terraform_destroy** process successfully completing, along with the number of resources destroyed
- Upload to Assignments > Activities - GitHub Actions and WordPress



Terraform_destroy

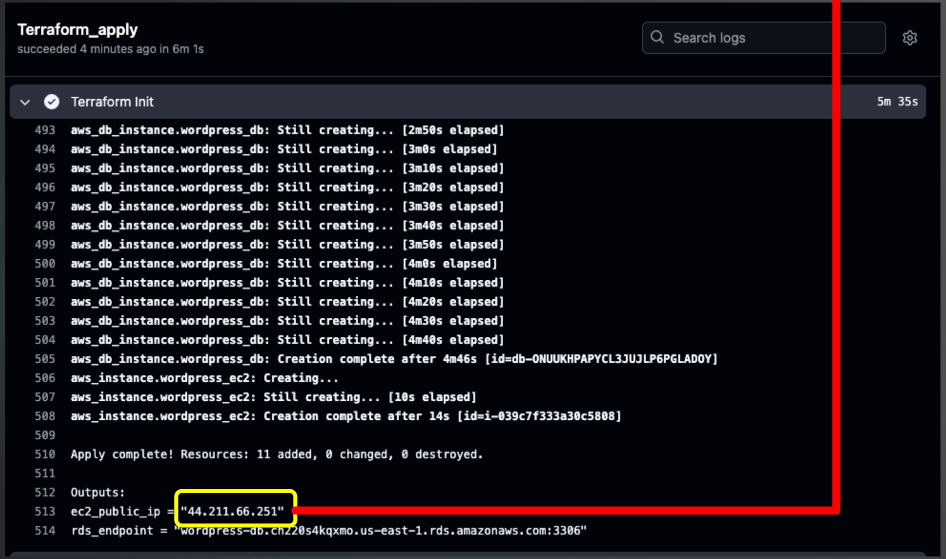
succeeded 7 minutes ago in 1m 8s

Terraform Destroy 52s

```
          - {
              - cidr_blocks      = [
                  - "0.0.0.0/0",
                ]
              - description      = "ssh"
              - from_port        = 22
              - ipv6_cidr_blocks = []
              - prefix_list_ids  = []
              - protocol         = "tcp"
              - security_groups  = []
              - self             = false
              - to_port          = 22
            },
        ] -> null
      - name                   = "allow_http" -> null
      - owner_id               = "***" -> null
      - revoke_rules_on_delete = false -> null
      - tags                   = {
          - "Name" = "allow_http_ssh"
        } -> null
      - tags_all               = {
          - "Name" = "allow_http_ssh"
        } -> null
      - vpc_id                 = "vpc-0fc7dc50036f9975c" -> null
    }
Plan: 0 to add, 0 to change, 2 to destroy.

Changes to Outputs:
  - instance_ip_addr = "172.31.25.181" -> null
  - public_ip        = "3.92.52.24" -> null
aws_instance.my_server: Destroying... [id=i-0257d6cbdd2ba1e04]
aws_instance.my_server: Still destroying... [id=i-0257d6cbdd2ba1e04, 10s elapsed]
aws_instance.my_server: Still destroying... [id=i-0257d6cbdd2ba1e04, 20s elapsed]
aws_instance.my_server: Still destroying... [id=i-0257d6cbdd2ba1e04, 30s elapsed]
aws_instance.my_server: Still destroying... [id=i-0257d6cbdd2ba1e04, 40s elapsed]
aws_instance.my_server: Destruction complete after 40s
aws_security_group.allow_http_ssh: Destroying... [id=sg-04ed449d5fb41a45d]
aws_security_group.allow_http_ssh: Destruction complete after 1s

Destroy complete! Resources: 2 destroyed.

```

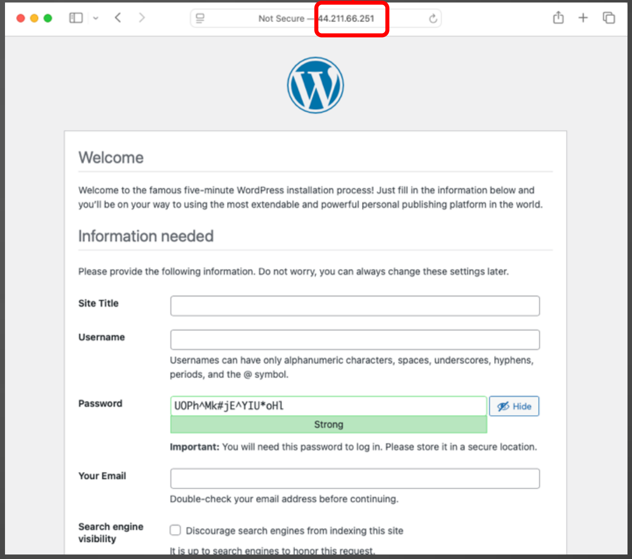
Deliverable - Bonus

- For an extra bonus point, use the code from the WordPress and RDS activity and create the corresponding GitHub actions for apply and destroy
- You will need to submit 3 screenshots Upload to Assignments > Activities - GitHub Actions and WordPress



```
aws_db_instance.wordpress_db: Still creating... [2m50s elapsed]
aws_db_instance.wordpress_db: Still creating... [3m0s elapsed]
aws_db_instance.wordpress_db: Still creating... [3m10s elapsed]
aws_db_instance.wordpress_db: Still creating... [3m20s elapsed]
aws_db_instance.wordpress_db: Still creating... [3m30s elapsed]
aws_db_instance.wordpress_db: Still creating... [3m40s elapsed]
aws_db_instance.wordpress_db: Still creating... [3m50s elapsed]
aws_db_instance.wordpress_db: Still creating... [4m0s elapsed]
aws_db_instance.wordpress_db: Still creating... [4m10s elapsed]
aws_db_instance.wordpress_db: Still creating... [4m20s elapsed]
aws_db_instance.wordpress_db: Still creating... [4m30s elapsed]
aws_db_instance.wordpress_db: Still creating... [4m40s elapsed]
aws_db_instance.wordpress_db: Creation complete after 4m46s [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY]
aws_instance.wordpress_ec2: Creating...
aws_instance.wordpress_ec2: Still creating... [10s elapsed]
aws_instance.wordpress_ec2: Creation complete after 14s [id=i-039c7f333a30c5808]

Apply complete! Resources: 11 added, 0 changed, 0 destroyed.

Outputs:
ec2_public_ip = "44.211.66.251"
rds_endpoint = "wordpress-db.ch220s4kqxmo.us-east-1.rds.amazonaws.com:3306"
```

- Screenshot #1: Show the results of Terraform apply



Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Do not worry, you can always change these settings later.

Site Title

Username

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

Password: UOPh^Mk#jE^YIU*oHl Hide

Strong

Important: You will need this password to log in. Please store it in a secure location.

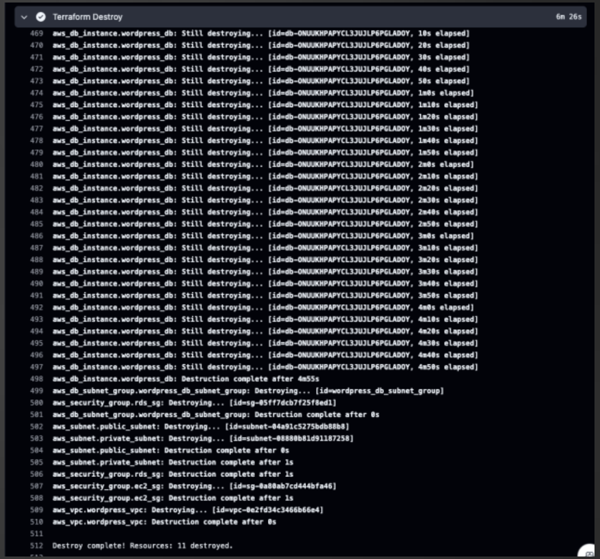
Your Email

Double-check your email address before continuing.

Search engine visibility: □ Discourage search engines from indexing this site

It is up to search engines to honor this request.

- Screenshot #2: Show WordPress running with the ec2_public_ip from the Terraform apply



```
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 10s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 20s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 30s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 40s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 50s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 1m0s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 1m10s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 1m20s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 1m30s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 1m40s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 1m50s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 2m0s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 2m10s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 2m20s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 2m30s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 2m40s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 2m50s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 3m0s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 3m10s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 3m20s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 3m30s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 3m40s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 3m50s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 4m0s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 4m10s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 4m20s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 4m30s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 4m40s elapsed]
aws_db_instance.wordpress_db: Still destroying... [id=db-ONUUKHPAPYCL3JUJLP6PGLADOY, 4m50s elapsed]
aws_db_instance.wordpress_db: Destruction complete after 4m55s
aws_db_subnet_group.wordpress_db_subnet_group: Destroying... [id=wordpress_db_subnet_group]
aws_security_group.rds_sg: Destroying... [id=sg-05ff7dcb7f25f8ed1]
aws_db_subnet_group.wordpress_db_subnet_group: Destruction complete after 0s
aws_subnet.public_subnet: Destroying... [id=subnet-04a91c5275bdb88b8]
aws_subnet.private_subnet: Destroying... [id=subnet-08880b81d91187258]
aws_subnet.public_subnet: Destruction complete after 0s
aws_subnet.private_subnet: Destruction complete after 1s
aws_security_group.rds_sg: Destruction complete after 1s
aws_security_group.ec2_sg: Destroying... [id=sg-0a80ab7cd444bfa46]
aws_security_group.ec2_sg: Destruction complete after 1s
aws_vpc.wordpress_vpc: Destroying... [id=vpc-0e2fd34c3466b66e4]
aws_vpc.wordpress_vpc: Destruction complete after 0s

Destroy complete! Resources: 11 destroyed.
```

- Screenshot #3: Show the successful output from the Terraform destroy