DevOps Lab Assignment

#### (Provide your code snippets. You may answer the questions with screenshots if applicable.)

In this lab, we're going to deploy some of the services we’ve used in class through “Infrastructure as Code” tools. To start, you’ll deploy using Terraform on your local machine. Then, you’ll take the Terraform logic that you wrote and put it in a GitHub repo and configure a GitHub Action to deploy automatically anytime a code change is pushed to the repo. At the end, you’ll need to make a simple architecture diagram of what you deployed.

Here’s what we want to deploy:

|  |  |  |
| --- | --- | --- |
| **Service** | **Example Name** | **Other Settings** |
| Resource Group | dsba6190-cford38-dev-000-rg | None |
| Storage Account | dsba6190cford38dev000st | * Turn on the hierarchical namespace * LRS Replication * Standard account tier |
| Machine Learning Workspace | dsba6190-cford38-dev-000-mlw | None |
| Cosmos DB | dsba6190-cford38-dev-000-cosmos | * Kind: MongoDB |
| *Service of your choice 1 (Fill in)* |  |  |
| *Service of your choice 2 (Fill in)* |  |  |

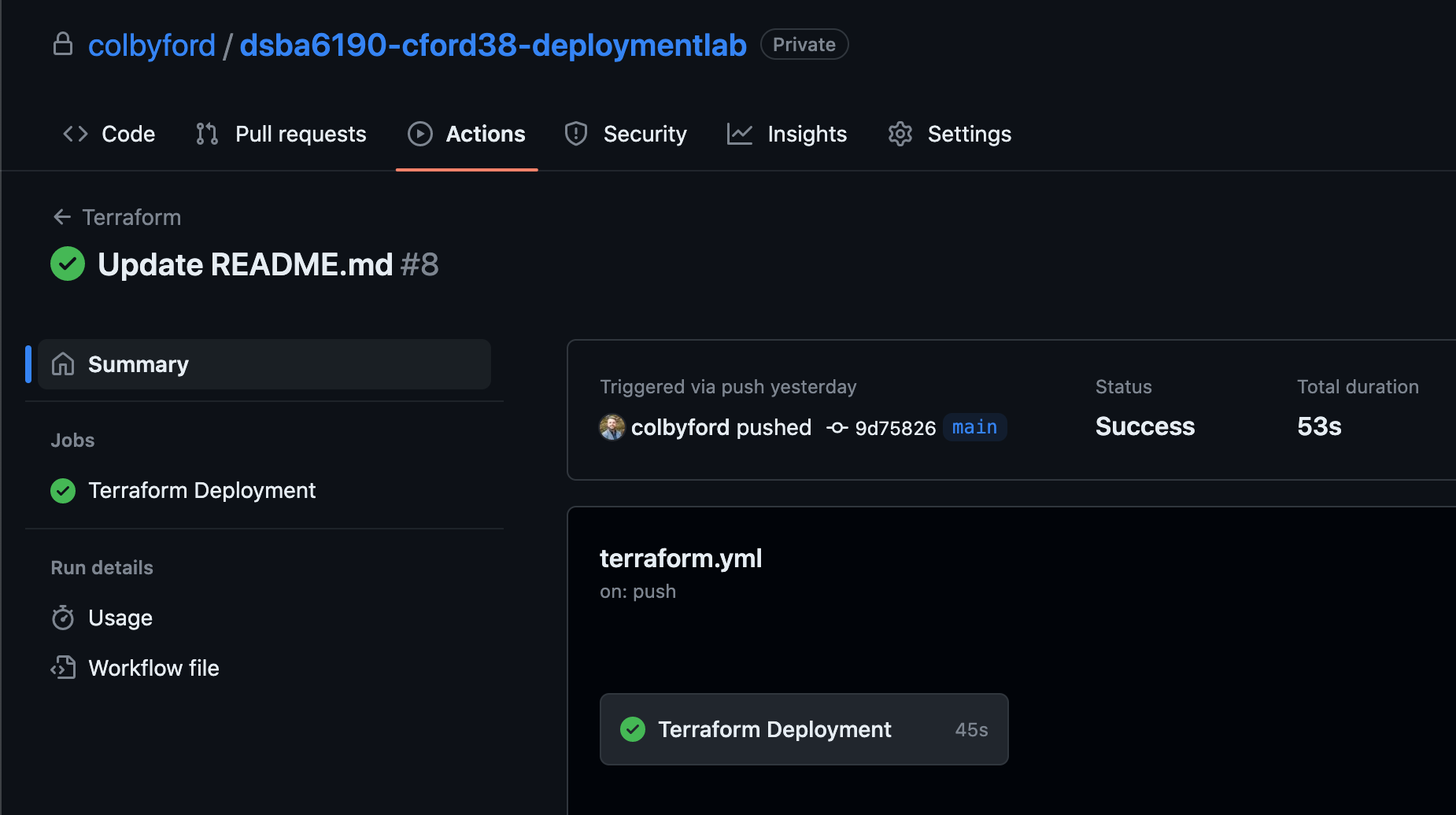
Note that you get to choose 2 services that you’re interested in seeing. Please don’t deploy some giant (expensive) compute service. Some good examples for the “your choice” items could be a Data Science VM, Function App, Web App, Kubernetes Service, IoT services, a Firewall, etc. When in doubt, ask. ☺

### A couple notes:

* You’ll need to make a GitHub repository with an Action and add in Secrets.
  + Here’s my example repo: <https://github.com/colbyford/dsba6190-cford38-deploymentlab>
  + How to make Secrets: <https://docs.github.com/en/actions/security-guides/encrypted-secrets>
* Here are the suffixes you should use for service names: <https://learn.microsoft.com/en-us/azure/cloud-adoption-framework/ready/azure-best-practices/resource-abbreviations>
* Here’s the Terraform documentation: <https://registry.terraform.io/providers/hashicorp/azurerm/latest/docs>
* Each person should submit the lab individually (Feel free to work together and help each other out, of course.)

## Create a GitHub Action and Deploy

1. In GitHub, create a new private repo called `dsba6190-<yourname>-deploymentlab`.
   1. Provide the URL to your repo:
2. Add in the Secrets for the UNCC Tenant and DSBA6190 Subscription
   * (Settings > Secrets and variables > Actions).
3. Add the instructor’s GitHub username (`colbyford`) to your Collaborators
   * (Settings > Collaborators).
4. Write your Terraform code in three files: main.tf, backend.tf, and variables.tf
   * Once you have these files, you’ll need to `terraform init` from your command line to initialize the Terraform environment around your .tf files.
   * Next, you can run `terraform fmt --recursive` to check that your .tf files are formatted correctly.
   * Run `az login` to login to your UNCC account. This is the credential that Terraform will use for local stuff.
   * Lastly, you can run `terraform plan` to have Terraform tell you what it is going to deploy.
5. Add your Terraform code to the repository. Then, commit and push those changes to GitHub.
   * The GitHub Action will run an addition Terraform command called `terraform apply` that will deploy the things the `plan` step said previously.
   * If you have issues with your GitHub Action pipeline failing, check your Secrets. Alternatively, you can run the `terraform apply` locally to see what is breaking.
6. Provide a screenshot of the successful deployment. (Replace the figure below.)



1. In Azure, check to see if your resources were deployed. Provide a screenshot of your Resource Group (replace the figure below).

Graphical user interface, text, application, email

Description automatically generated

## Show What You Built

Draw a simple architecture diagram that shows the Resource Group and all the services that were deployed into it. Be sure to include each of the service names.

* Feel free to use PowerPoint or Visio or some other tool to draw the diagram.
* Here’s the link to the Azure Icons: https://learn.microsoft.com/en-us/azure/architecture/icons/