Exercise 3

In this exercise, you will start laying the infrastructure for the course project by creating a VPC and subnets via an AWS CloudFormation template. You will create more AWS resources in these subnet in the subsequent exercises.
You will also create an Amazon EC2 instance and learn how to connect to it using an SSH client. You use an SSH client for remote login and administration over an authenticated secure channel. You will then look at the log files on the instance and extract information from the instance metadata and user data script.

To get started, follow the steps below.

1. Launch an AWS CloudFormation template to create VPC and subnets.

In this section, you will create a VPC and subnets by launching an AWS CloudFormation template. If you are familiar with AWS CloudFormation, you may want to attempt to complete this section by using the properties below before reading the step-by-step instructions.

Region: Oregon (us-west-2)
CloudFormation template: Download template
Name of the stack: edx-vpc-stack

▶ Expand for step-by-step instructions.

2. Launch an Amazon EC2 instance with a user data script in a VPC.

In this section, you will launch an Amazon EC2 instance with an user data script. If you are familiar with Amazon EC2, you may want to attempt to complete this section by using the properties below before reading the step-by-step instructions.

Region: Oregon (us-west-2)
Amazon Machine Image (AMI): Amazon Linux AMI *(Do not use the Amazon Linux 2 AMI)*
Instance Type: t2.micro
Network VPC: edx-build-aws-vpc
Subnet: edx-subnet-public-a
User data script: Download
Tag: Ex3WebServer

Security group name: exercise3-sg
Security group rules: Allow HTTP and SSH
Key Pair: Create a new key pair and save it for later use.

▶ Expand for step-by-step instructions.

3. Connect to your Amazon EC2 instance.

In this section, you will connect to your Amazon EC2 instance via SSH. An SSH connection requires port 22 to be open on your network. You may need to contact your network administrator to ensure that this is open.

For MAC/Linux users:

- Open the **Terminal** application.
- Type the commands below. In both commands, replace **PATH-TO-PEM-FILE** with a reference to the .pem file that you downloaded while launching the instance. In the second command, replace **PUBLIC-IP** with the IPv4 Public IP of the instance.

```
chmod 400 PATH-TO-PEM-FILE
ssh -i PATH-TO-PEM-FILE ec2-user@PUBLIC-IP
```

- You will see a prompt like the one below. Answer **yes** to the prompt.

```
The authenticity of host '54.201.7.240
(54.201.7.240)' can't be established. ECDSA key
fingerprint is
SHA256:TrCPkFBL0F+pTp3LH+UGFPhGjl7N4qaoLucu21RWsRM.
Are you sure you want to continue connecting
(yes/no)?
```

For Windows users:

▶ Expand for step-by-step instructions.

4. View log file, query instance metadata, and user data.

In this section, you will inspect the cloud-init logs to verify the steps in the UserData script executed on the Amazon EC2 Instance. Then, you will query the instance metadata service from the Amazon EC2 instance so that you can see how your application is printing information about itself on the welcome page.

- To view the log file, type the command below in your instance terminal.

  ```
  cat /var/log/cloud-init-output.log
  ```

  Explore the log file to see the log entries generated for installing the user data script.
- To view the instance metadata, type the command below:

  ```
  curl http://169.254.169.254/latest/meta-data/
  ```

- Execute the command below to get the instance identity document of your instance:

  ```
  curl http://169.254.169.254/latest/dynamic/instance-identity/document
  ```

- Execute the command below to get the instance public IP address:

  ```
  curl http://169.254.169.254/latest/meta-data/public-ipv4
  ```

- Execute the command below to get the MAC address of the instance:

```
curl http://169.254.169.254/latest/meta-data/mac
```

- Execute the command below to get the VPC ID in which the instance resides. Make sure to replace **Your-MAC** in the command below with the MAC address of your instance:

  ```
  curl http://169.254.169.254/latest/meta-data/network/interfaces/macs/Your-MAC/vpc-id
  ```

- Execute the command below to get the subnet-id in which the instance resides. Make sure to replace **Your-MAC** in the command below with the MAC address of your instance:

  ```
  curl http://169.254.169.254/latest/meta-data/network/interfaces/macs/Your-MAC/subnet-id
  ```

- Execute the command below to get the instance user data:

  ```
  curl http://169.254.169.254/latest/user-data
  ```

- Go to the **EC2 dashboard** in your console, locate the Amazon EC2 instance you created and verify the public IP address, the VPC ID and the subnet-id of the instance you just queried in the instance terminal. You should be able see this information in the **Description** tab at the bottom.

5. Terminate the Amazon EC2 instance.

In this section, you will terminate the Amazon EC2 instance by selecting the instance in the EC2 dashboard and clicking **Actions -> Instance State -> Terminate** .

▶ Expand for step-by-step instructions.