Assignments

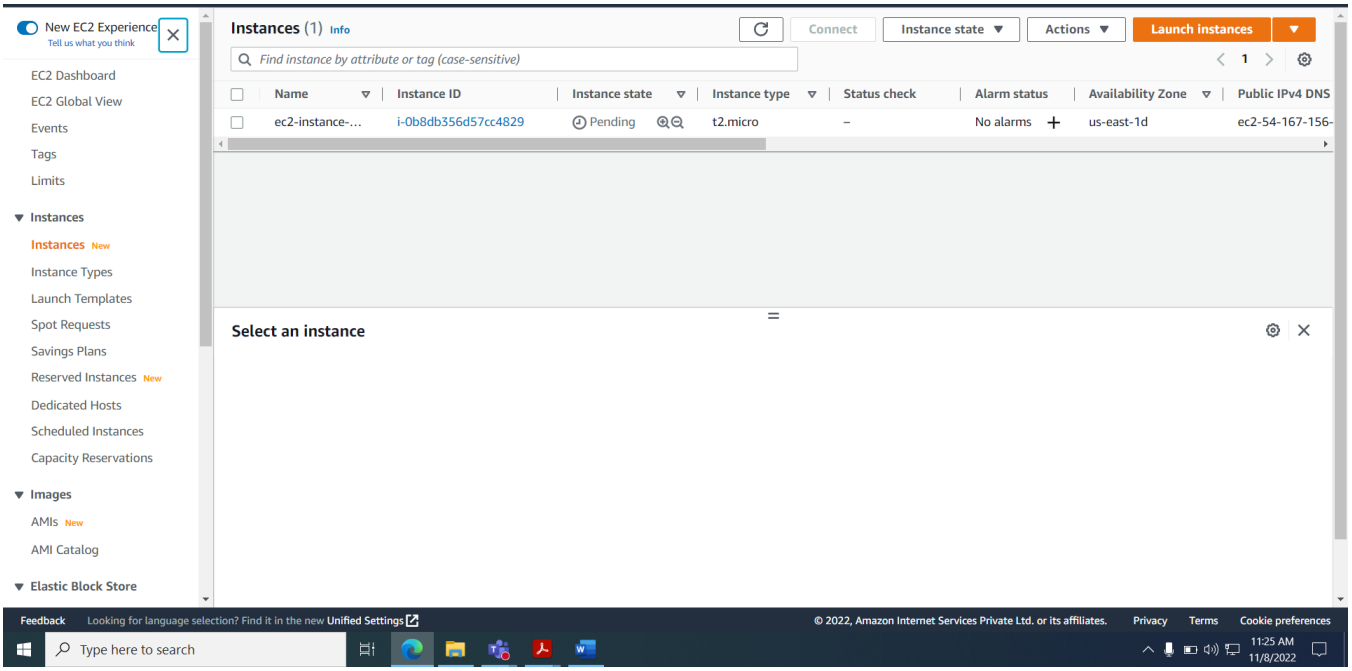
Assignment 01: Create a web server and an Amazon RDS DB instance.

Install an Apache web server with PHP and create a MySQL database. The web server runs on an Amazon EC2 instance using Amazon Linux, and the MySQL database is a MySQL DB instance. Both the Amazon EC2 instance and the DB instance run in a virtual private cloud (VPC) based on the Amazon VPC service.

1. Launch an EC2 instance
2. Create a DB instance
3. Install a web server on your EC2 instance

1. Create an Amazon EC2 instance in the public subnet of your VPC:

- Sign into the AWS Management Console and open the Amazon EC2 console at https://console.aws.amazon.com/ec2/ .
- In the upper-right corner of the AWS Management Console, choose the AWS Region where you want to create the EC2 instance.
- Choose **EC2 Dashboard**, and then choose **Launch instance**, as shown following
- Make sure you have opted into the new launch experience
- Under Name and tags, for Name, enter ec2-instance-web-server.
- Under **Application and OS Images (Amazon Machine Image)**, choose **Amazon Linux**, and then choose the **Amazon Linux 2 AMI**. Keep the defaults for the other choices.
- Under **Instance type**, choose **t2.micro**.
- Under **Key pair (login)**, choose a **Key pair name** to use an existing key pair. To create a new key pair for the Amazon EC2 instance, choose **Create new key pair** and then use the **Create key pair** window to create it.
- Under **Network settings**, set these values and keep the other values as their defaults:
  For **Allow SSH traffic from**, choose the source of SSH connections to the EC2 instance.
  Turn on **Allow HTTPs traffic from the internet**.
  Turn on **Allow HTTP traffic from the internet**.
- Leave the default values for the remaining sections.
- Review a summary of your instance configuration in the **Summary** panel, and when you're ready, choose **Launch instance**.
- On the **Launch Status** page, shown following, note the identifier for your new EC2 instance.
- Choose **View all instances** to find your instance.
- Wait until **Instance state** for your instance is **Running** before continuing.


New EC2 Experience
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EC2 Dashboard
EC2 Global View
Events
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Instances New
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Spot Requests
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Dedicated Hosts
Scheduled Instances
Capacity Reservations
Images
AMIs New
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Elastic Block Store
Instances (1) Info
Connect
Instance state
Actions
Launch instances
Find instance by attribute or tag (case-sensitive)
Name
Instance ID
Instance state
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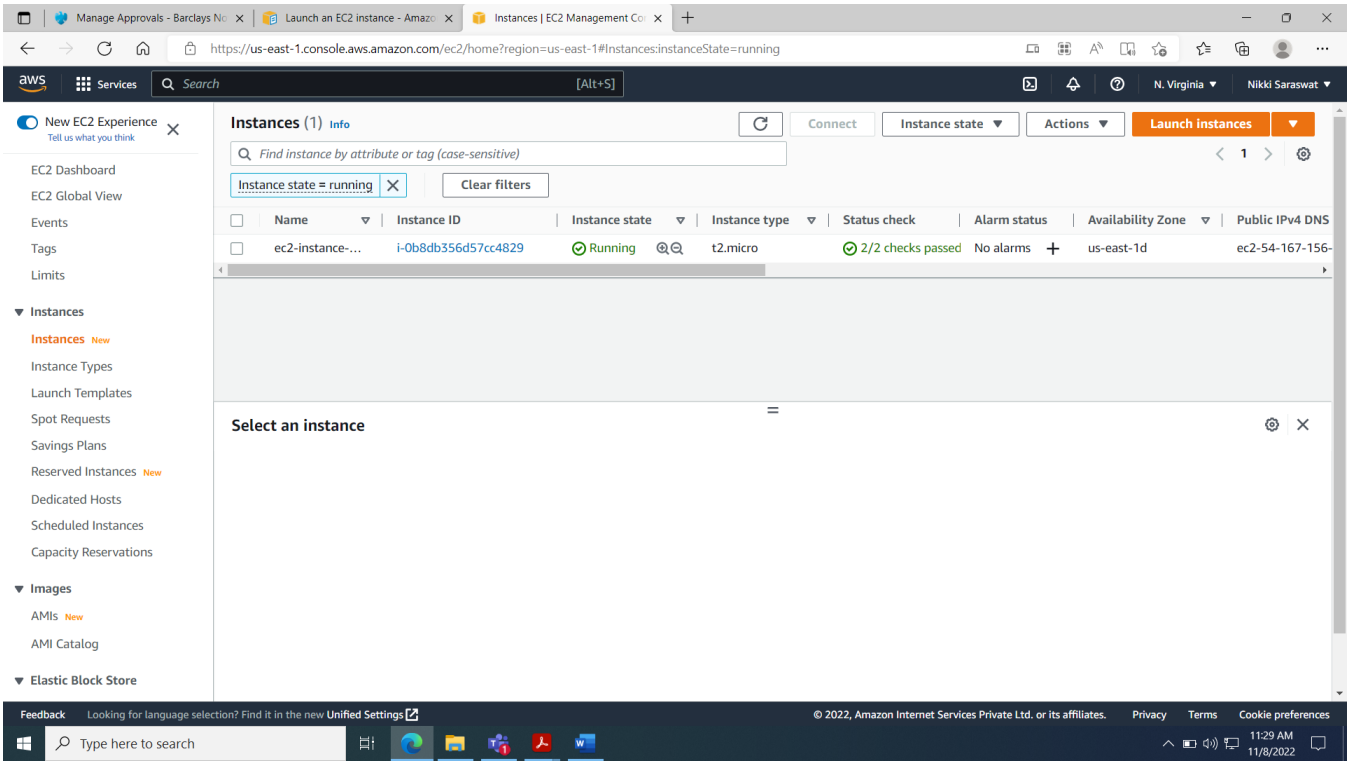
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Find instance by attribute or tag (case-sensitive)
Instance state = running
Clear filters
Name
Instance ID
Instance state
Instance type
Status check
Alarm status
Availability Zone
Public IPv4 DNS
ec2-instance-...
i-0b8db356d57cc4829
Running
t2.micro
2/2 checks passed
No alarms
us-east-1d
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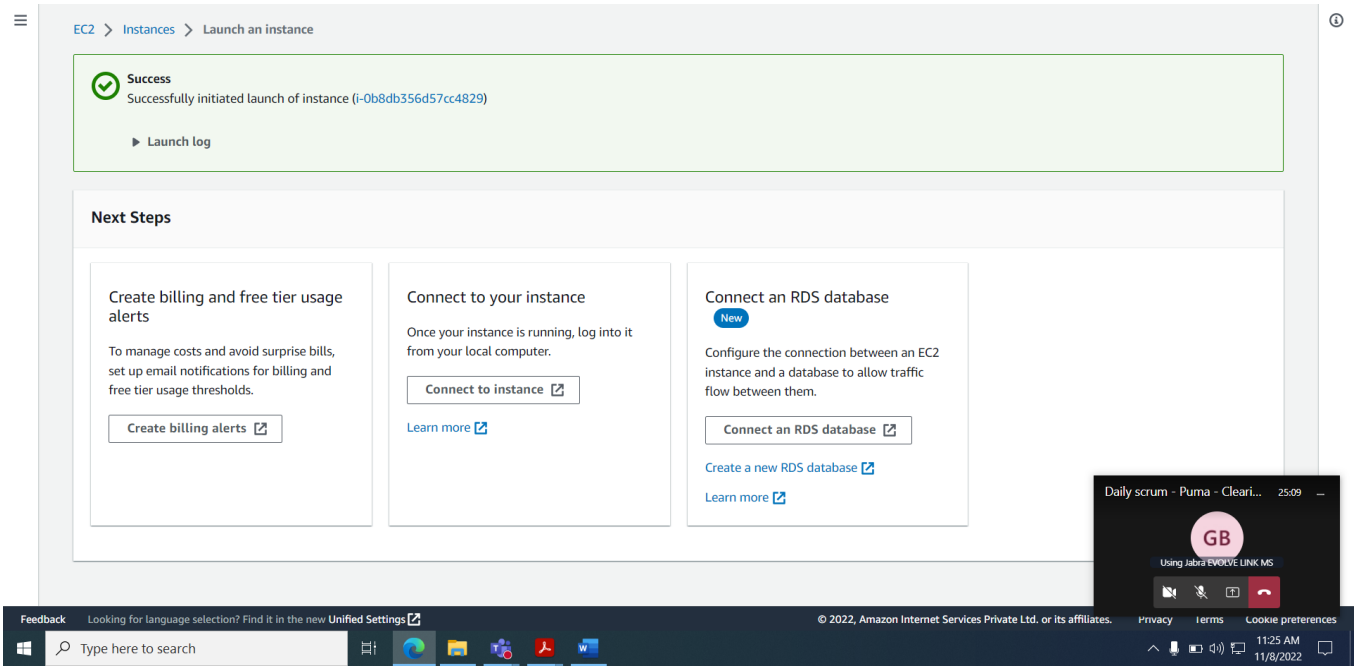
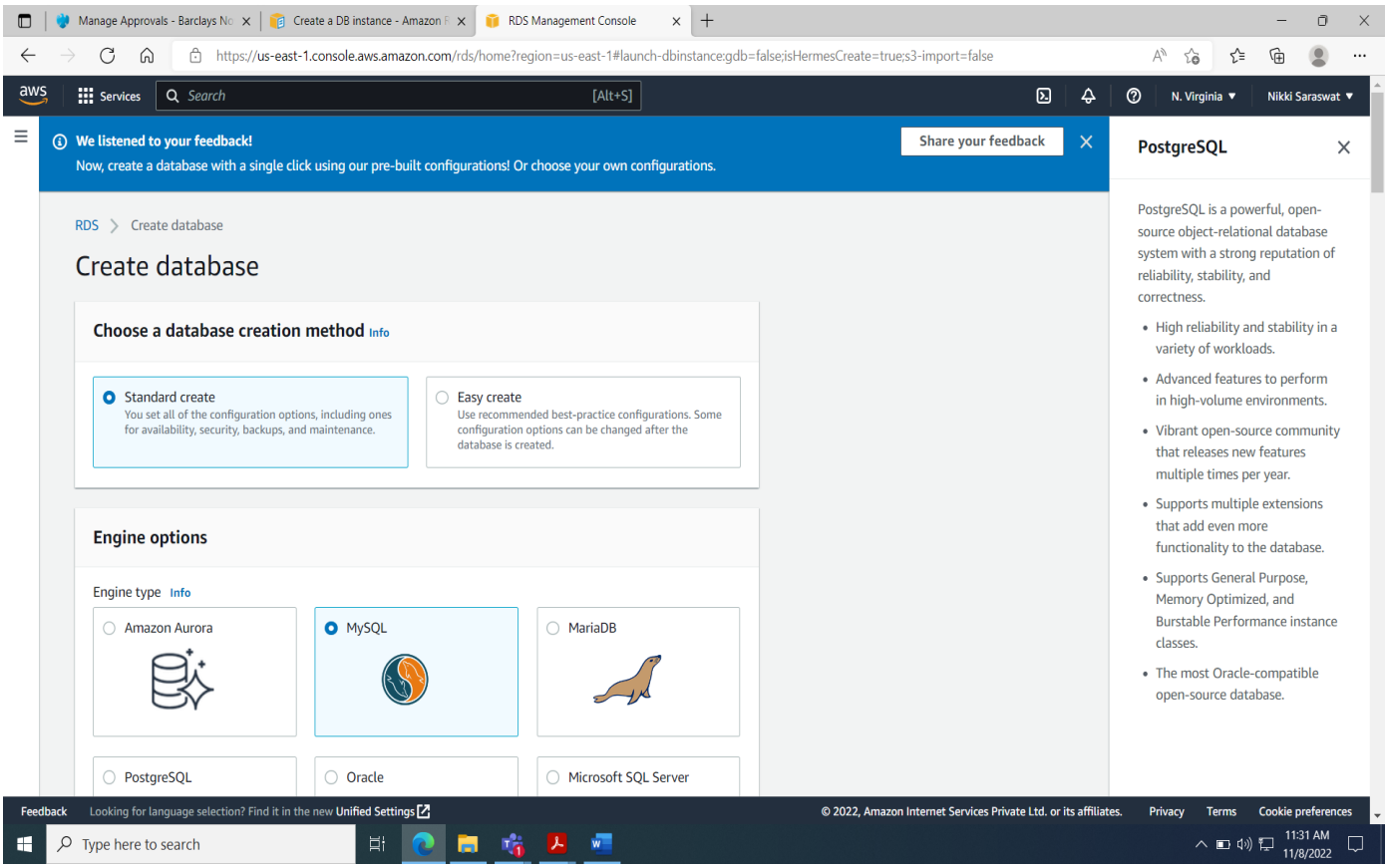


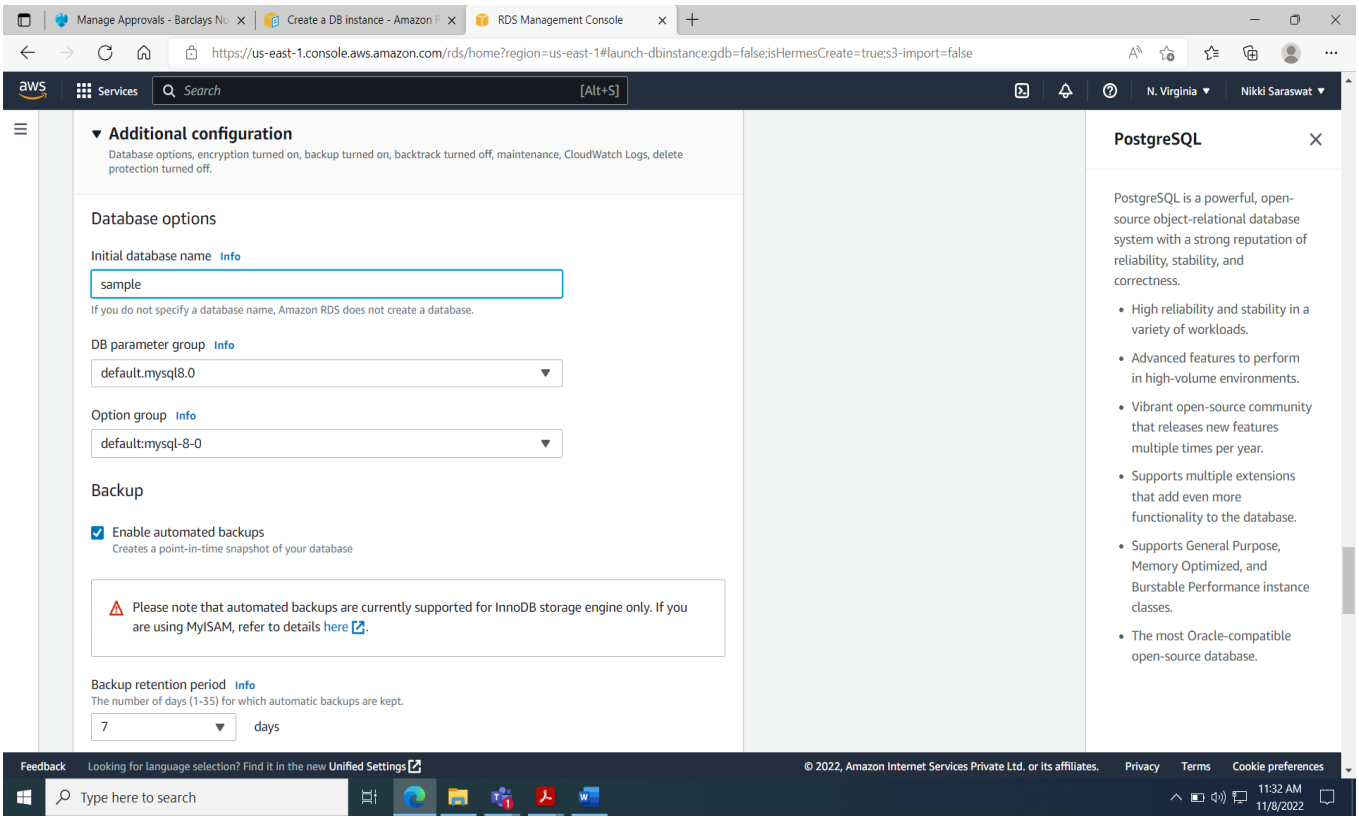
2. Create an Amazon RDS for MySQL DB instance that maintains the data used by a web application.

- In the upper-right corner of the AWS Management Console, check the AWS Region. It should be the same as the one where you created your EC2 instance
- In the navigation pane, choose **Databases**.
- Choose **Create database**.
- On the **Create database** page, shown following, make sure that the **Standard create** option is chosen, and then choose **MySQL**.
- In the **Templates** section, choose **Free tier.**
- In the **Availability and durability** section, keep the defaults.
- In the **Settings** section, set these values:
  DB instance identifier – **db-instance**
  Master username – admi
  Auto generate a password – Leave the option turned off.
  Master password – **********
  Confirm password – **********
- In the **Instance configuration** section, set these values: **Burstable classes (includes t classes)db.t3.micro**
- In the **Storage** section, keep the defaults.
- In the **Connectivity** section, set these values and keep the other values as their defaults:
  For **Compute resource**, choose **Connect to an EC2 compute resource**.
  For **EC2 instance**, choose the EC2 instance you created previously, such as **ec2-instance-web-server**.

- In the **Database authentication** section, make sure **Password authentication** is selected.
- Open the **Additional configuration** section, and enter **sample** for **Initial database name**. Keep the default settings for the other options.
- To create your MySQL DB instance, choose **Create database**.

  Your new DB instance appears in the **Databases** list with the status **Creating**.
- Wait for the **Status** of your new DB instance to show as **Available**. Then choose the DB instance name to show its details.
- In the **Connectivity & security** section, view the **Endpoint** and **Port** of the DB instance.

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https://us-east-1.console.aws.amazon.com/rds/home?region=us-east-1#launch-dbinstance:gdb=false;isHermesCreate=true;s3-import=false
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Additional configuration
Database options, encryption turned on, backup turned on, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.
Database options
Initial database name Info
sample
If you do not specify a database name, Amazon RDS does not create a database.
DB parameter group Info
default.mysql8.0
Option group Info
default:mysql-8-0
Backup
Enable automated backups
Creates a point-in-time snapshot of your database
Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to details here.
Backup retention period Info
The number of days (1-35) for which automatic backups are kept.
7
days
PostgreSQL
PostgreSQL is a powerful, open-source object-relational database system with a strong reputation of reliability, stability, and correctness.
High reliability and stability in a variety of workloads.
Advanced features to perform in high-volume environments.
Vibrant open-source community that releases new features multiple times per year.
Supports multiple extensions that add even more functionality to the database.
Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
The most Oracle-compatible open-source database.
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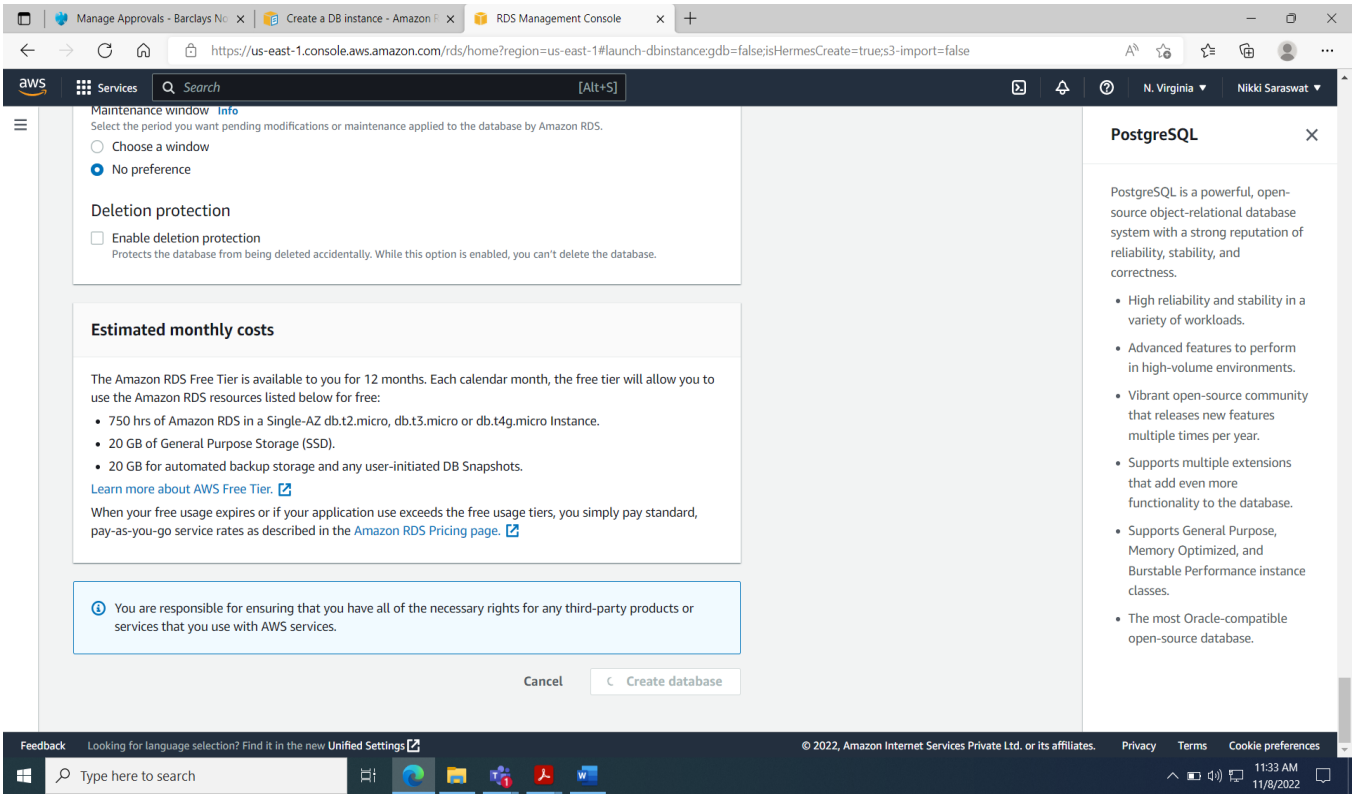
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RDS Management Console
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Maintenance window Info
Select the period you want pending modifications or maintenance applied to the database by Amazon RDS.
Choose a window
No preference
Deletion protection
Enable deletion protection
Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.
Estimated monthly costs
The Amazon RDS Free Tier is available to you for 12 months. Each calendar month, the free tier will allow you to use the Amazon RDS resources listed below for free:
750 hrs of Amazon RDS in a Single-AZ db.t2.micro, db.t3.micro or db.t4g.micro Instance.
20 GB of General Purpose Storage (SSD).
20 GB for automated backup storage and any user-initiated DB Snapshots.
Learn more about AWS Free Tier.
When your free usage expires or if your application use exceeds the free usage tiers, you simply pay standard, pay-as-you-go service rates as described in the Amazon RDS Pricing page.
You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.
Cancel
Create database
PostgreSQL
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High reliability and stability in a variety of workloads.
Advanced features to perform in high-volume environments.
Vibrant open-source community that releases new features multiple times per year.
Supports multiple extensions that add even more functionality to the database.
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3. Install a web server on your EC2 instance
   Install an Apache web server with PHP and MariaDB

- Connect to the EC2 instance that you created earlier by following the steps in Connect to your Linux instance.
- Get the latest bug fixes and security updates by updating the software on your EC2 instance. To do this, use the following command.
  sudo yum update -y
- After the updates complete, install the PHP software using the amazon-linux-extras install command. This command installs multiple software packages and related dependencies at the same time.
  sudo amazon-linux-extras install php8.0 mariadb10.5
- Install the Apache web server.
  sudo yum install -y httpd
- Start the web server with the command shown following.
  sudo systemctl start httpd
- Configure the web server to start with each system boot using the systemctl command.
  sudo systemctl enable httpd

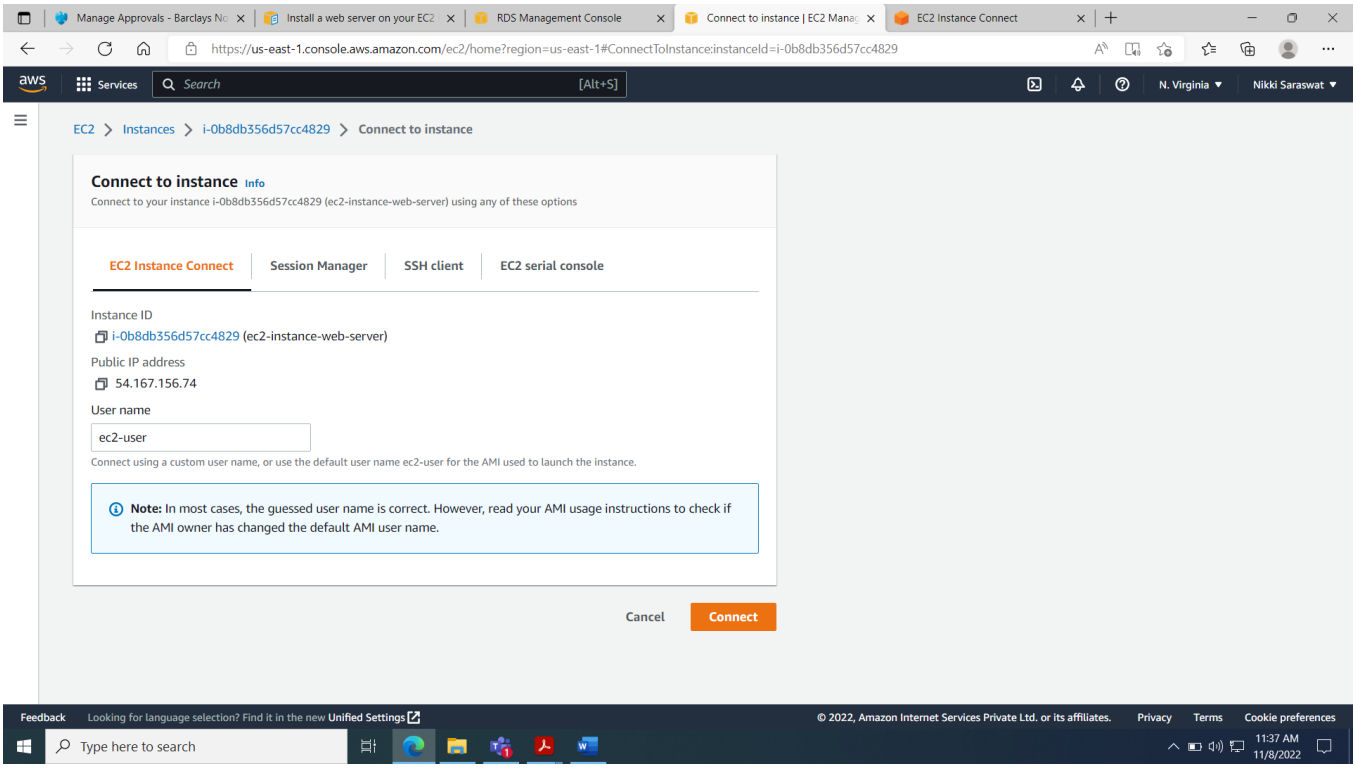
To set file permissions for the Apache web server:

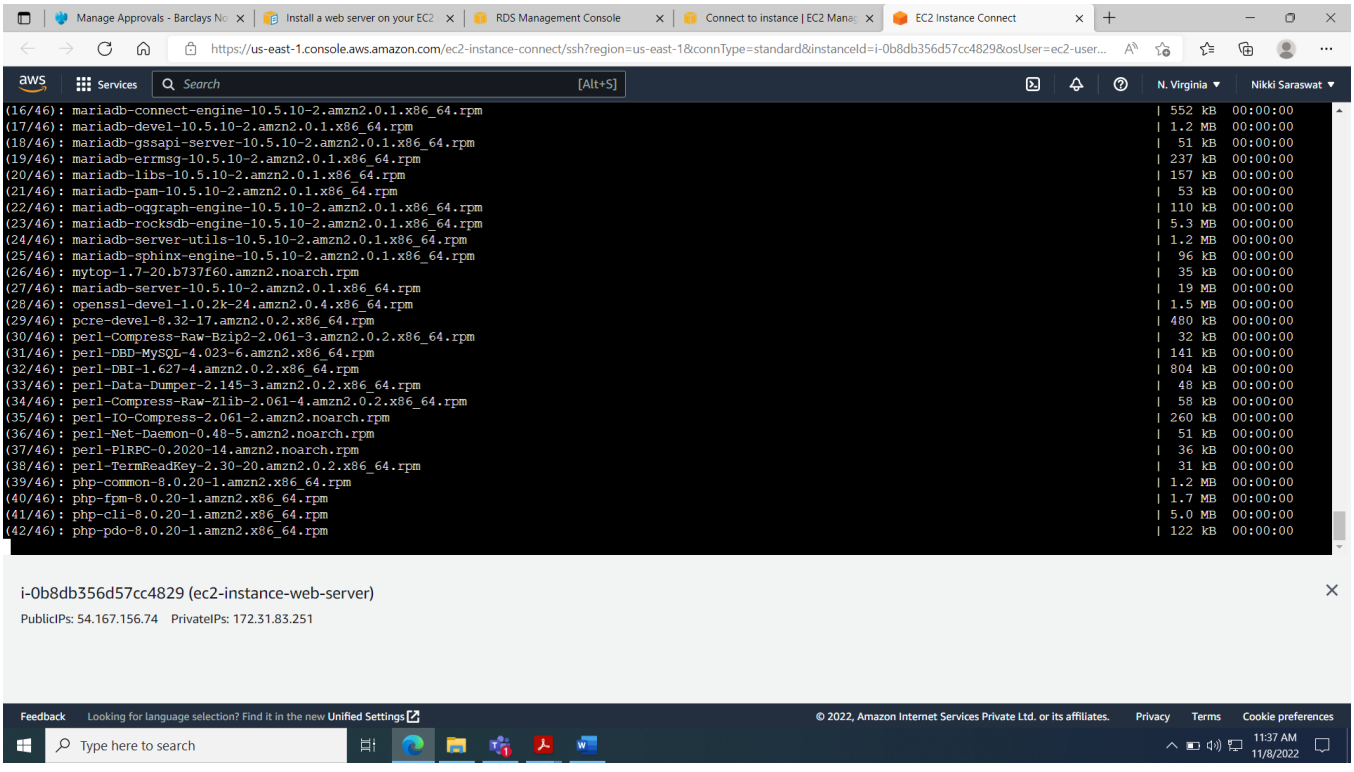
- Add the ec2-user user to the apache group.
  sudo usermod -a -G apache ec2-user
- Log out to refresh your permissions and include the new apache group.
  Exit
- Change the group ownership of the /var/www directory and its contents to the apache group.
  sudo chown -R ec2-user:apache /var/www
- Recursively change the permissions for files in the /var/www directory and its subdirectories to add group write permissions.
  find /var/www -type f -exec sudo chmod 0664 {} \;

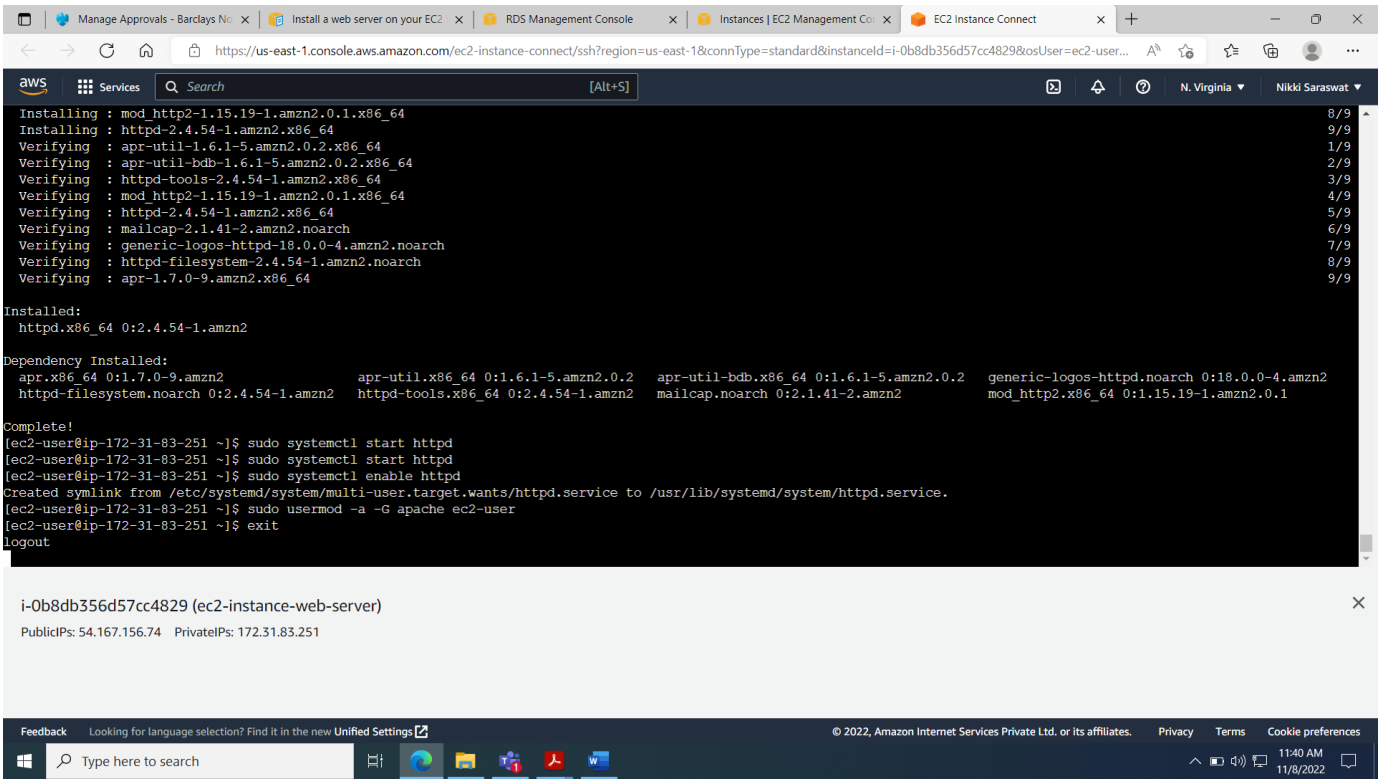
Connect your Apache web server to your DB instance:

- While still connected to your EC2 instance, change the directory to /var/www and create a new subdirectory named inc.
- Create a new file in the inc directory named dbinfo.inc, and then edit the file by calling nano (or the editor of your choice).
- Add the following contents to the dbinfo.inc file. Here, *db_instance_endpoint* is your DB instance endpoint, without the port, and *master password* is the master password for your DB instance.
- Save and close the dbinfo.inc file.
- Change the directory to /var/www/html.
- Create a new file in the html directory named SamplePage.php, and then edit the file by calling nano (or the editor of your choice).
- Add the following contents to the SamplePage.php file:
- Save and close the SamplePage.php file.

- Verify that your web server successfully connects to your DB instance by opening a web browser and browsing to http://*EC2 instance endpoint*/SamplePage.php



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Install a web server on your EC2
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Installing : mod_http2-1.15.19-1.amzn2.0.1.x86_64 8/9
Installing : httpd-2.4.54-1.amzn2.x86_64 9/9
Verifying : apr-util-1.6.1-5.amzn2.0.2.x86_64 1/9
Verifying : apr-util-bdb-1.6.1-5.amzn2.0.2.x86_64 2/9
Verifying : httpd-tools-2.4.54-1.amzn2.x86_64 3/9
Verifying : mod_http2-1.15.19-1.amzn2.0.1.x86_64 4/9
Verifying : httpd-2.4.54-1.amzn2.x86_64 5/9
Verifying : mailcap-2.1.41-2.amzn2.noarch 6/9
Verifying : generic-logos-httpd-18.0.0-4.amzn2.noarch 7/9
Verifying : httpd-filesystem-2.4.54-1.amzn2.noarch 8/9
Verifying : apr-1.7.0-9.amzn2.x86_64 9/9
Installed:
httpd.x86_64 0:2.4.54-1.amzn2
Dependency Installed:
apr.x86_64 0:1.7.0-9.amzn2
apr-util.x86_64 0:1.6.1-5.amzn2.0.2
apr-util-bdb.x86_64 0:1.6.1-5.amzn2.0.2
generic-logos-httpd.noarch 0:18.0.0-4.amzn2
httpd-filesystem.noarch 0:2.4.54-1.amzn2
httpd-tools.x86_64 0:2.4.54-1.amzn2
mailcap.noarch 0:2.1.41-2.amzn2
mod_http2.x86_64 0:1.15.19-1.amzn2.0.1
Complete!
[ec2-user@ip-172-31-83-251 ~]$ sudo systemctl start httpd
[ec2-user@ip-172-31-83-251 ~]$ sudo systemctl start httpd
[ec2-user@ip-172-31-83-251 ~]$ sudo systemctl enable httpd
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
[ec2-user@ip-172-31-83-251 ~]$ sudo usermod -a -G apache ec2-user
[ec2-user@ip-172-31-83-251 ~]$ exit
logout
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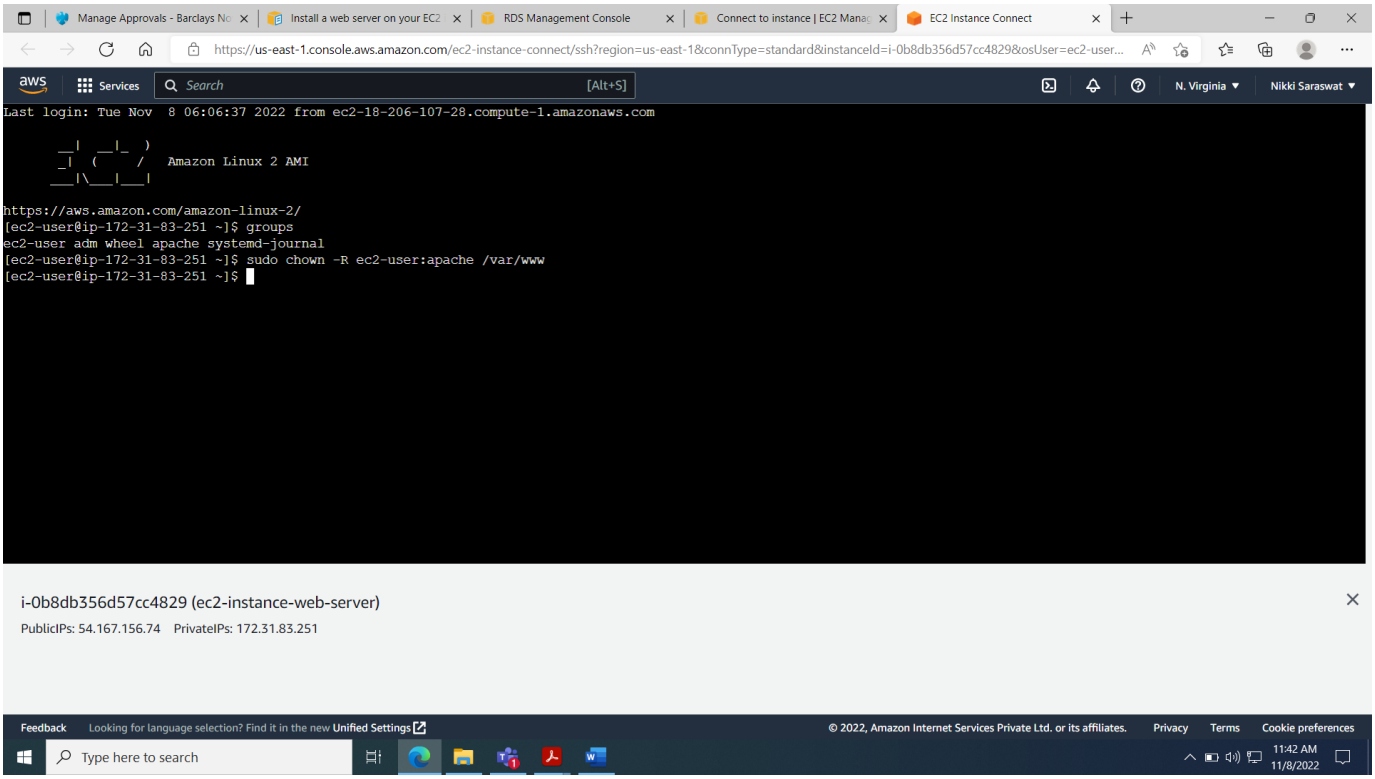
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Last login: Tue Nov 8 06:06:37 2022 from ec2-18-206-107-28.compute-1.amazonaws.com
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-83-251 ~]$ groups
ec2-user adm wheel apache systemd-journal
[ec2-user@ip-172-31-83-251 ~]$ sudo chown -R ec2-user:apache /var/www
[ec2-user@ip-172-31-83-251 ~]$
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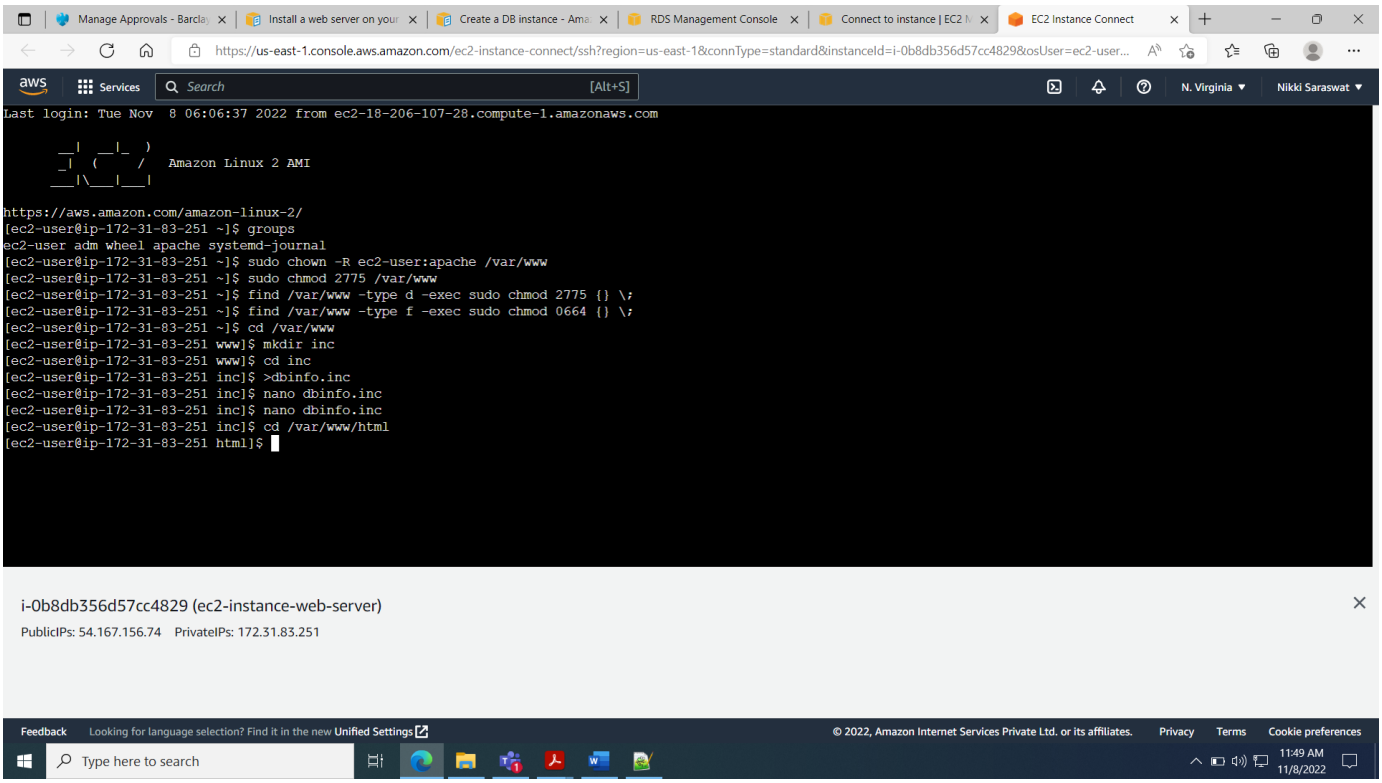
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Last login: Tue Nov 8 06:06:37 2022 from ec2-18-206-107-28.compute-1.amazonaws.com
Amazon Linux 2 AMI
https://aws.amazon.com/amazon-linux-2/
[ec2-user@ip-172-31-83-251 ~]$ groups
ec2-user adm wheel apache systemd-journal
[ec2-user@ip-172-31-83-251 ~]$ sudo chown -R ec2-user:apache /var/www
[ec2-user@ip-172-31-83-251 ~]$ sudo chmod 2775 /var/www
[ec2-user@ip-172-31-83-251 ~]$ find /var/www -type d -exec sudo chmod 2775 {} \;
[ec2-user@ip-172-31-83-251 ~]$ find /var/www -type f -exec sudo chmod 0664 {} \;
[ec2-user@ip-172-31-83-251 ~]$ cd /var/www
[ec2-user@ip-172-31-83-251 www]$ mkdir inc
[ec2-user@ip-172-31-83-251 www]$ cd inc
[ec2-user@ip-172-31-83-251 inc]$ >dbinfo.inc
[ec2-user@ip-172-31-83-251 inc]$ nano dbinfo.inc
[ec2-user@ip-172-31-83-251 inc]$ nano dbinfo.inc
[ec2-user@ip-172-31-83-251 inc]$ cd /var/www/html
[ec2-user@ip-172-31-83-251 html]$
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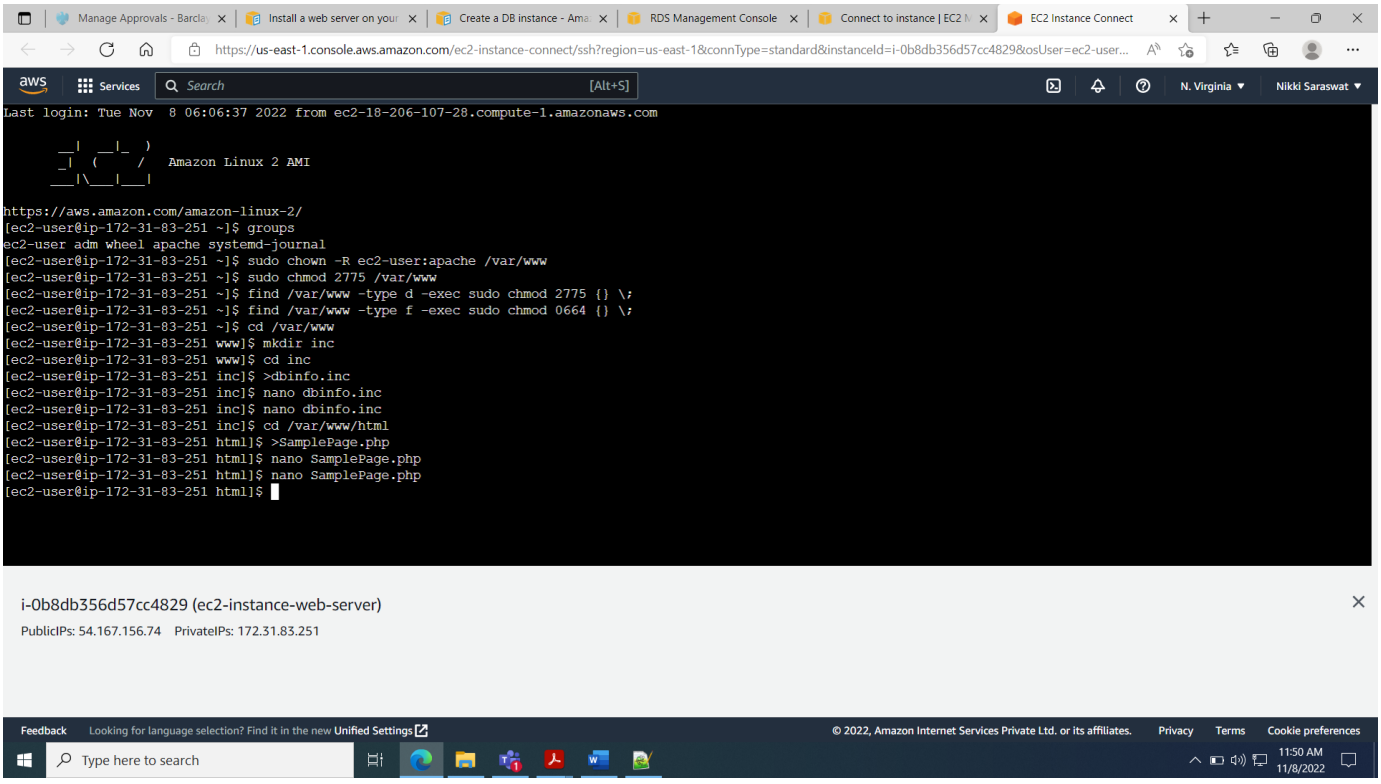
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[ec2-user@ip-172-31-83-251 ~]$ find /var/www -type f -exec sudo chmod 0664 {} \;
[ec2-user@ip-172-31-83-251 ~]$ cd /var/www
[ec2-user@ip-172-31-83-251 www]$ mkdir inc
[ec2-user@ip-172-31-83-251 www]$ cd inc
[ec2-user@ip-172-31-83-251 inc]$ >dbinfo.inc
[ec2-user@ip-172-31-83-251 inc]$ nano dbinfo.inc
[ec2-user@ip-172-31-83-251 inc]$ nano dbinfo.inc
[ec2-user@ip-172-31-83-251 inc]$ cd /var/www/html
[ec2-user@ip-172-31-83-251 html]$ >SamplePage.php
[ec2-user@ip-172-31-83-251 html]$ nano SamplePage.php
[ec2-user@ip-172-31-83-251 html]$ nano SamplePage.php
[ec2-user@ip-172-31-83-251 html]$
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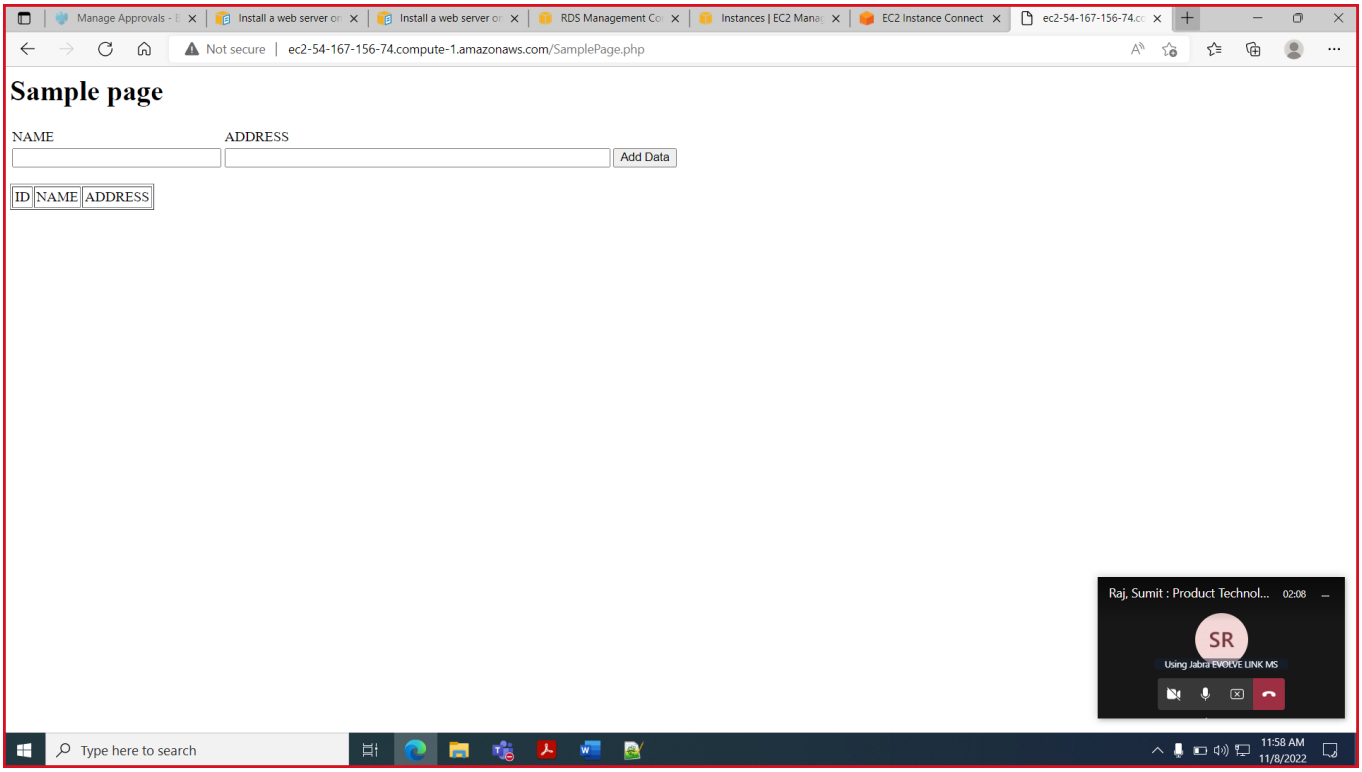


Assignment 02: (Amplify, Lambda & DynamoDB)

In this tutorial, you will create a simple web application. You will first build a static web app that renders "HelloWorld." Then you will learn how to add functionality to the web app so the text that displays is based on a custom input you provide.

Steps:

1. Create Web App: Deploy static resources for your web application using the AWS Amplify Console.
2. Build Serverless Function: Build a serverless function using AWS Lambda.
3. Link Serverless Function to Web App: Deploy your serverless function with API Gateway.
4. Create Data Table: Persist data in an Amazon DynamoDB table.
5. Add Interactivity to Web App: Modify your web app to invoke your API.

1. Create Web App with Amplify Console

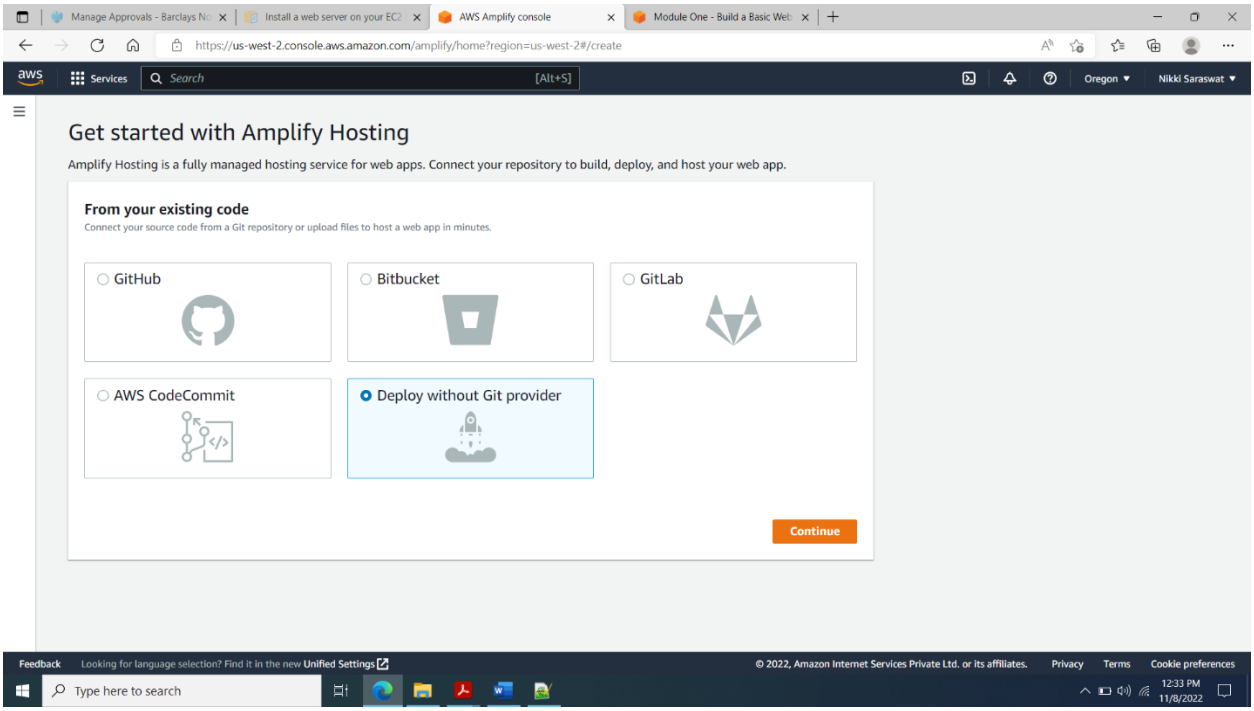
- Open your favorite text editor on your computer. Create a new file and paste the following HTML in it:

```
<!DOCTYPE html>
<html>
```

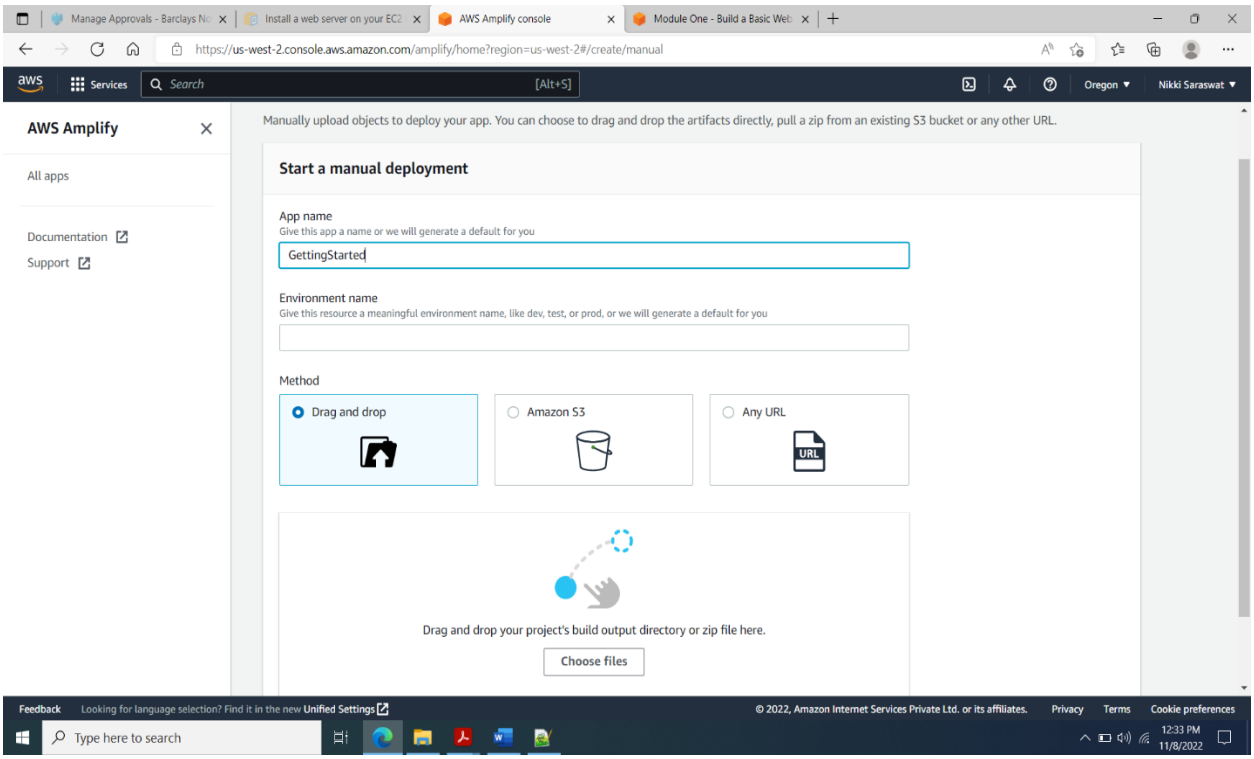
```
<head>
  <meta charset="UTF-8">
  <title>Hello World</title>
</head>

<body>
  Hello World
</body>
</html>
```

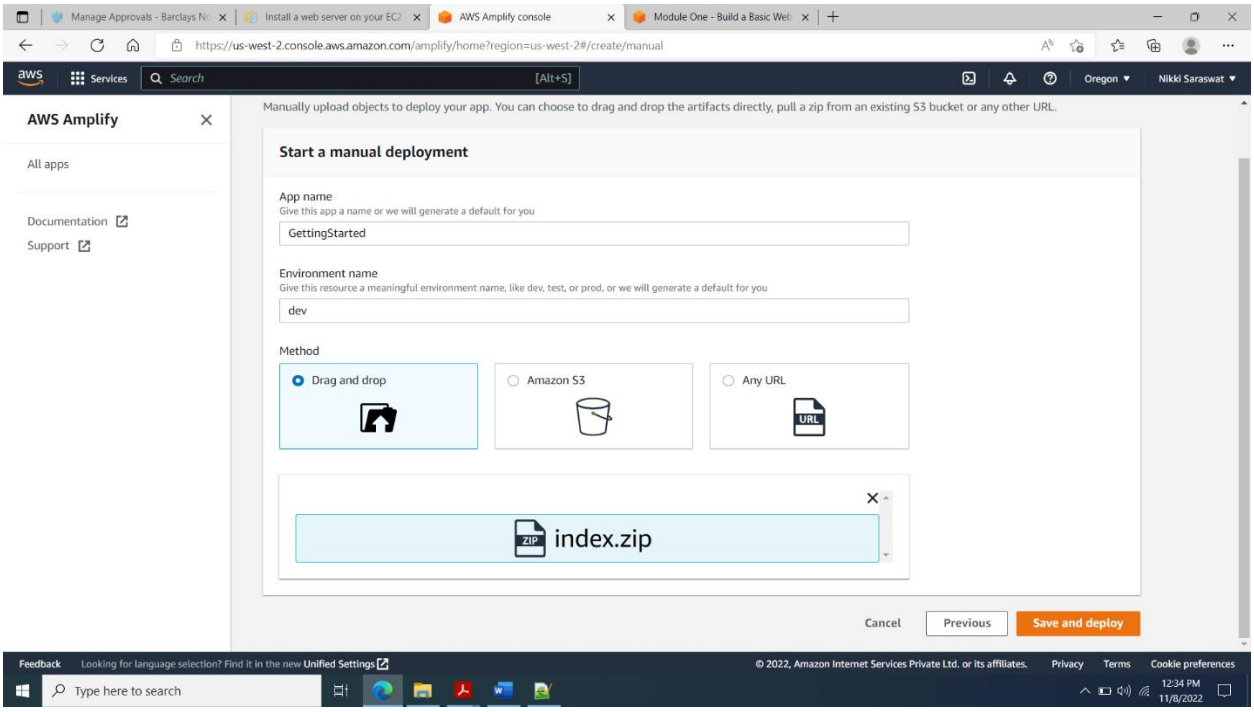
- Save the file as index.html.
- In a new browser window, log into the Amplify console. Note: We will be using the Oregon (us-west-2) Region for this tutorial.]



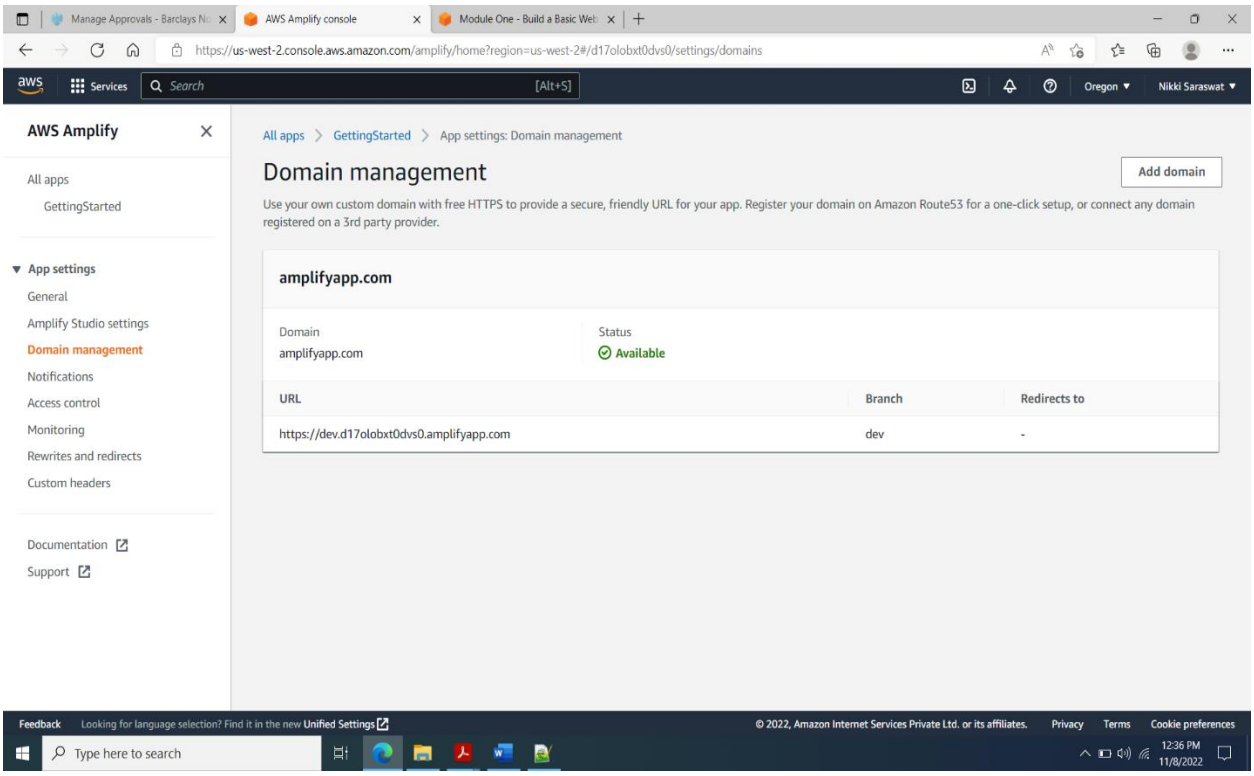
- In the Get Started section, under Host your web app, choose the orange Get started button.
- Select Deploy without Git provider.
- Choose the Continue button.
- In the App name field, enter GettingStarted.



- For Environment name, enter dev.
- Select the Drag and drop method.
- Choose the Choose files button.
- Select the ZIP file you created in Step 3.

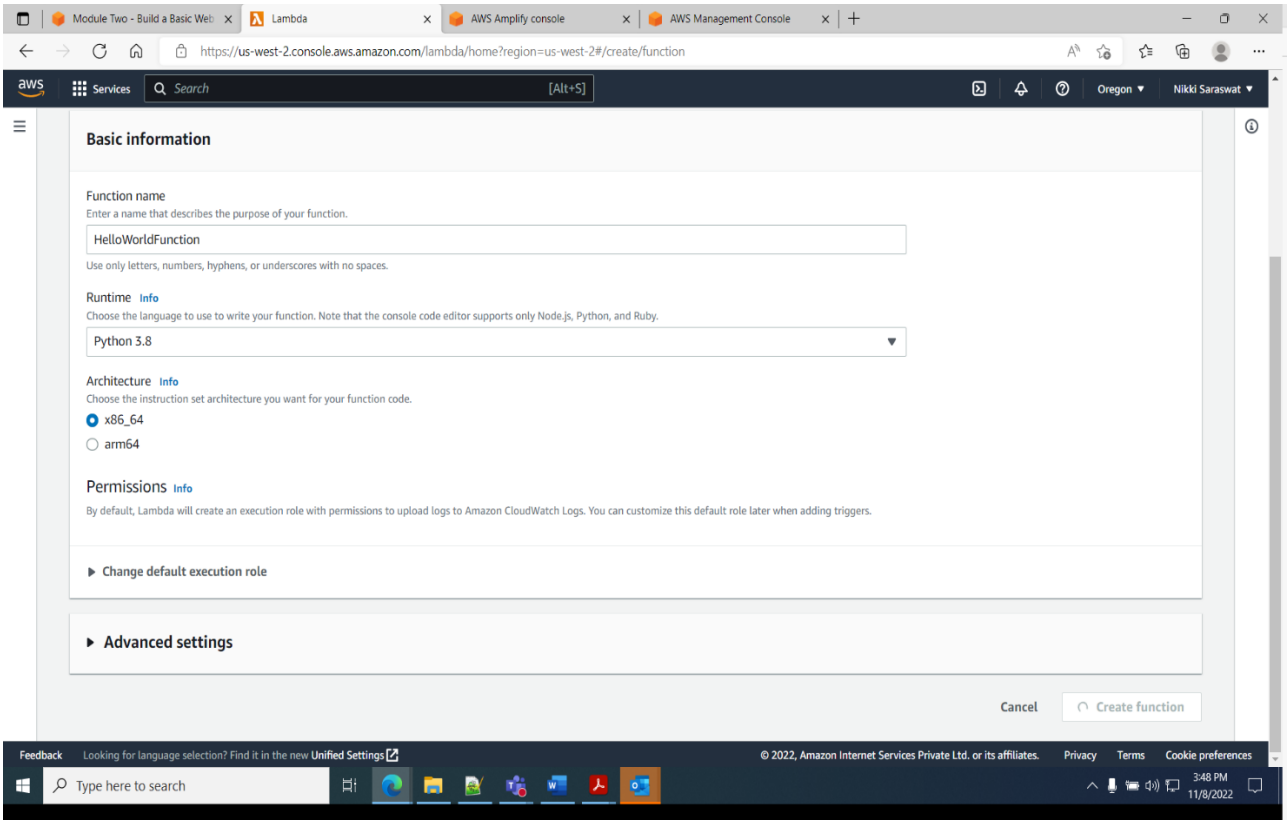


- Choose the Save and deploy button.
- After a few seconds, you should see the message Deployment successfully completed.

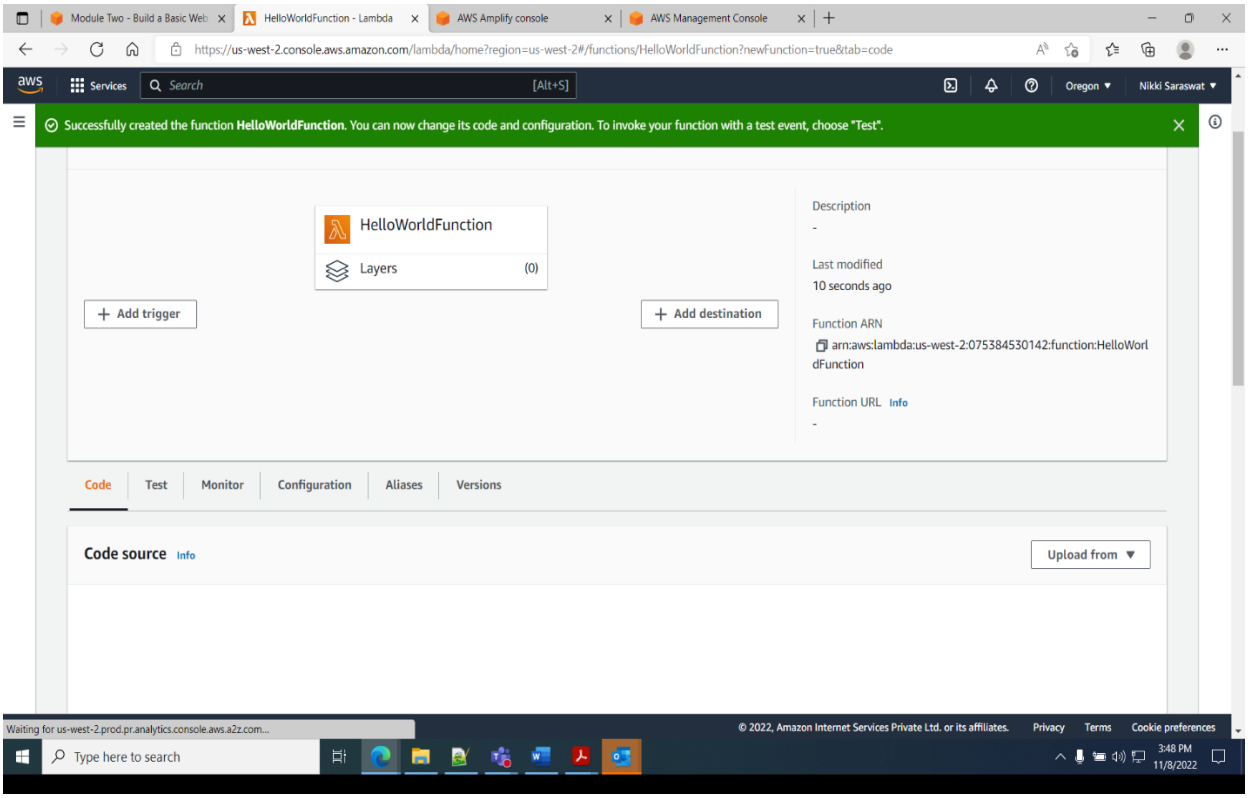
- 

2. Build a Serverless Function

- In a new browser tab, log in to the AWS Lambda console.
- Make sure you create your function in the same Region in which you created the web app in the previous module. You can see this at the very top of the page, next to your account name.
- Choose the orange Create function button.
- Under Function name, enter HelloWorldFunction.

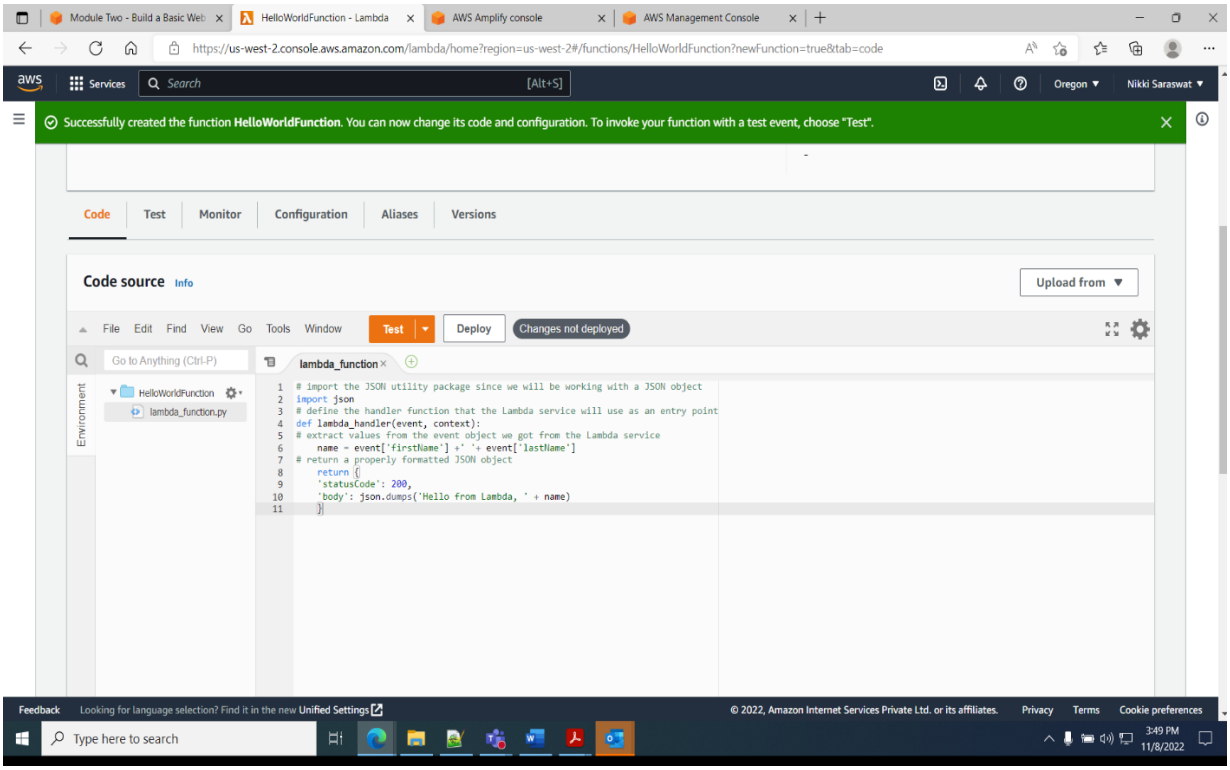


- Select Python 3.8 from the runtime dropdown and leave the rest of the defaults unchanged.
- Choose the orange Create function button.
- You should see a green message box at the top of your screen with the following message "Successfully created the function HelloWorldFunction."

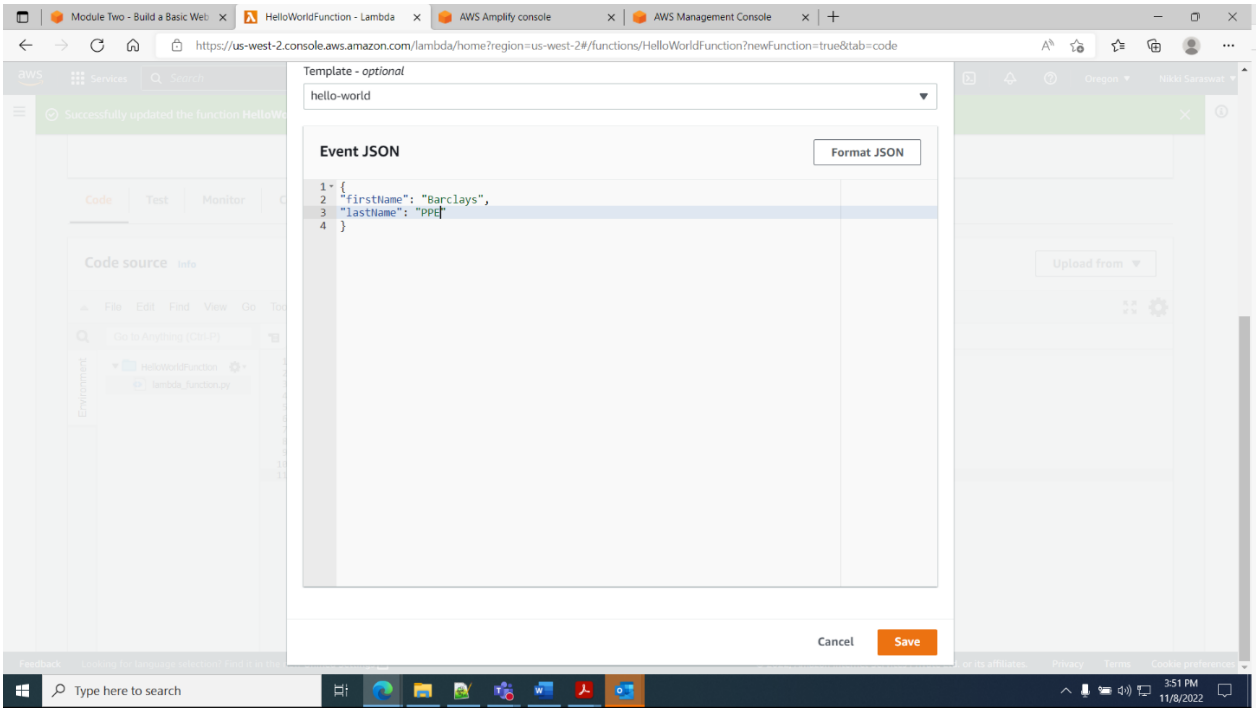


- Under Code source, replace the code in lambda_function.py with the following:

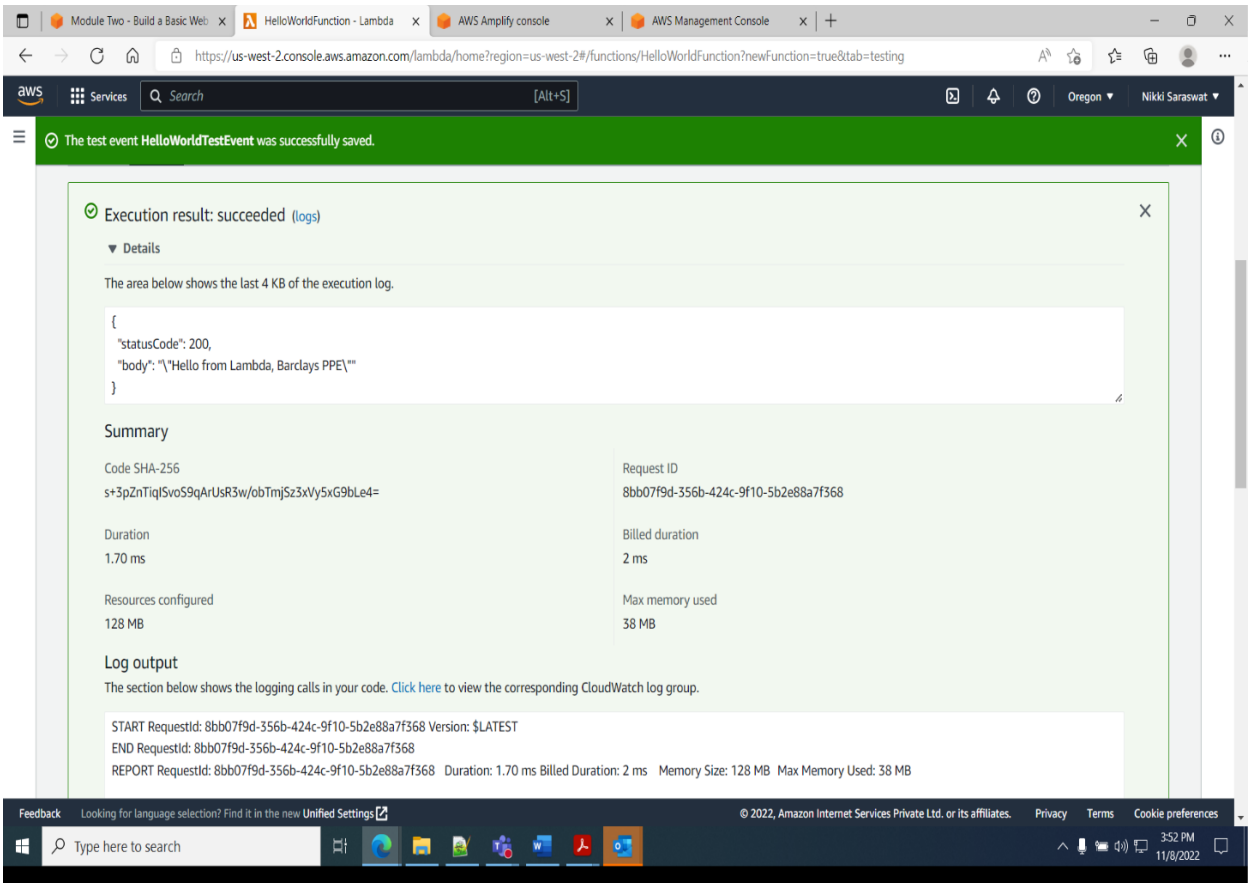
```
# import the JSON utility package since we will be working with a JSON object
import json
# define the handler function that the Lambda service will use as an entry point
def lambda_handler(event, context):
# extract values from the event object we got from the Lambda service
    name = event['firstName'] +' '+ event['lastName']
# return a properly formatted JSON object
    return {
    'statusCode': 200,
    'body': json.dumps('Hello from Lambda, ' + name)
    }
```



- Save by going to the file menu and selecting Save to save the changes.
- Choose Deploy to deploy the changes.
- Let's test our new function. Choose the orange Test button to create a test event by selecting Configure test event.
- Under Event name, enter HelloWorldTestEvent.
- Copy and paste the following JSON object to replace the default one:

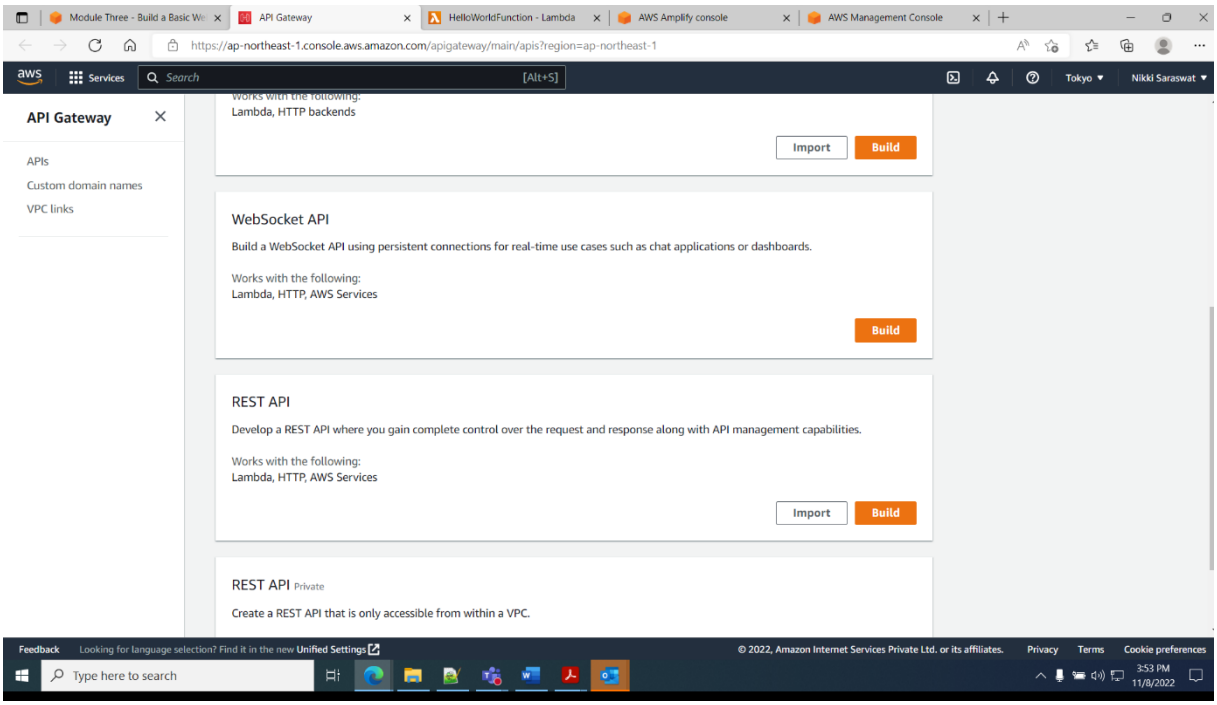


- Choose the orange Create button at the bottom of the page.

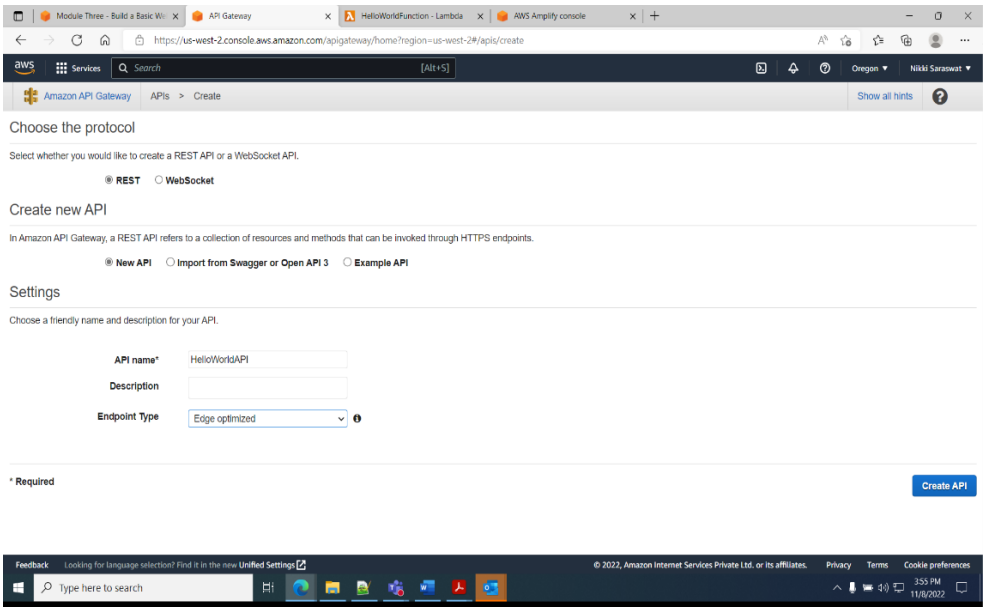


3.Link a Serverless Function to a Web App

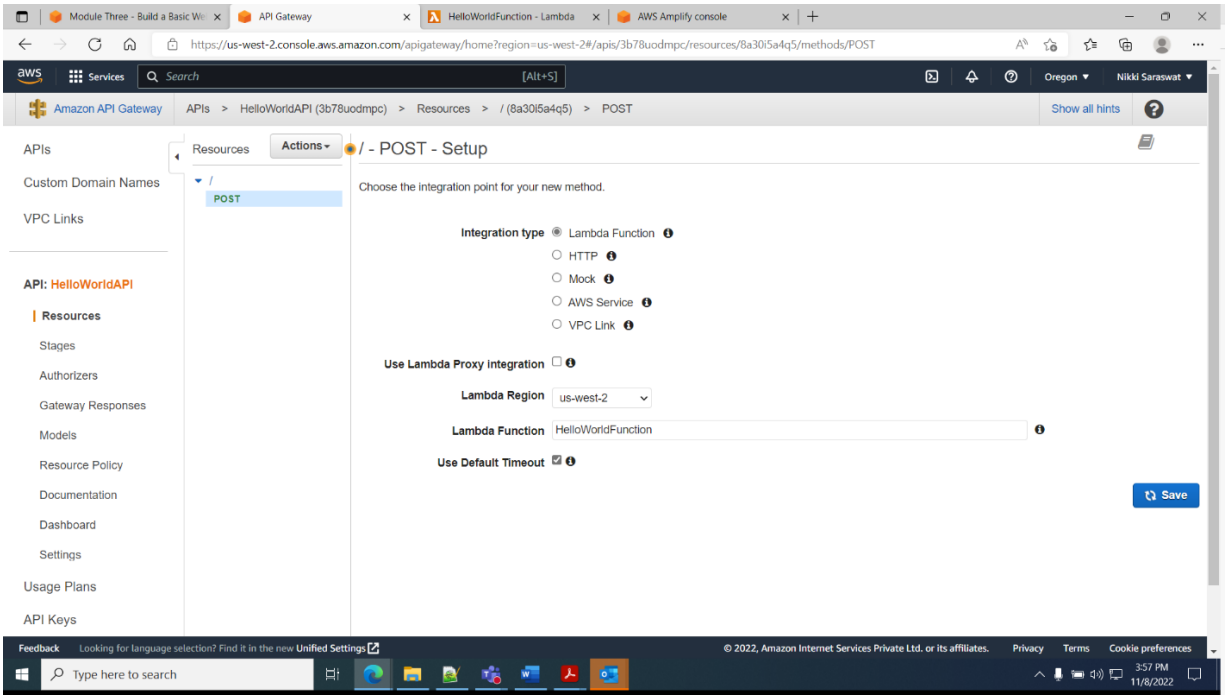
- Log in to the API Gateway console.



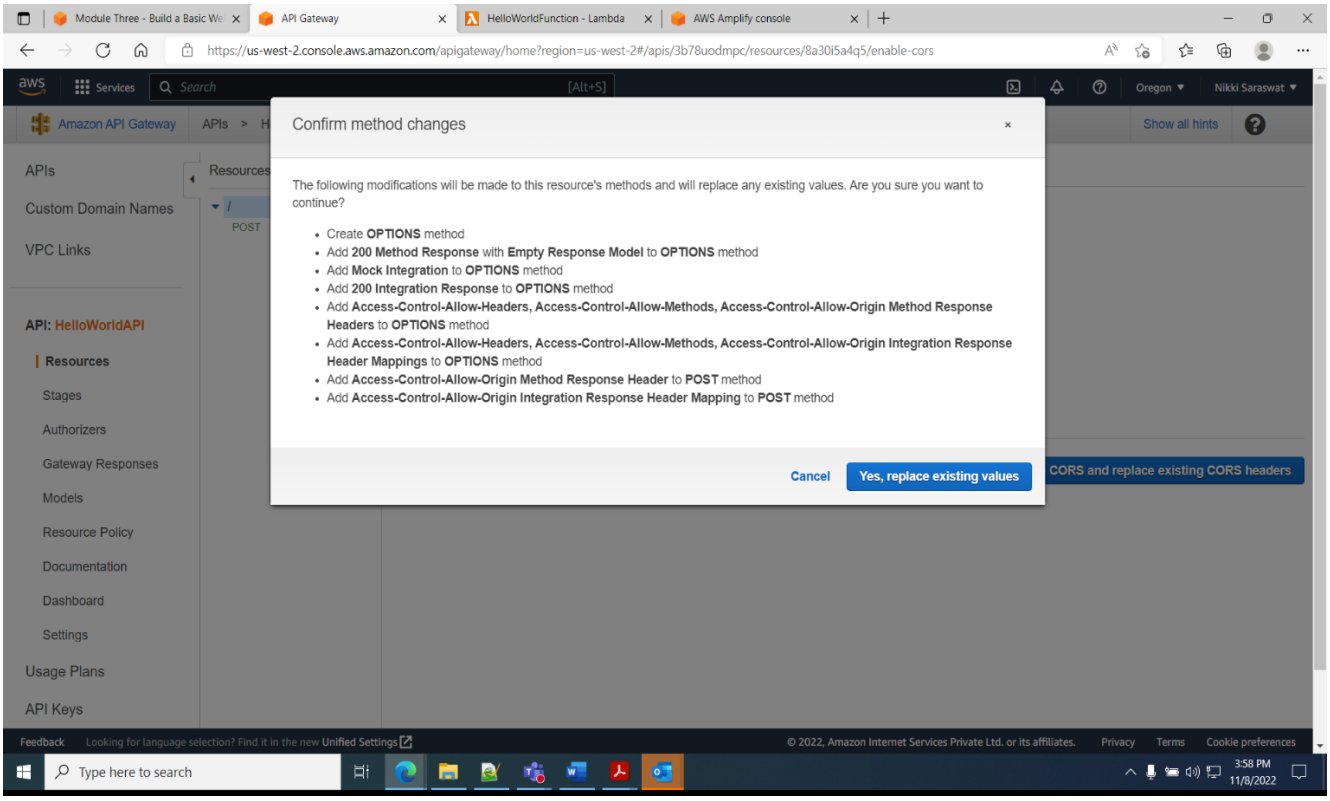
- In the Choose an API type section, find the REST API card and choose the Build button on the card.
- Under Choose the protocol, select REST.
- Under Create new API, select New API.
- In the API name field, enter HelloWorldAPI.
- Select Edge optimized from the Endpoint Type dropdown. (Note: Edge-optimized endpoints are best for geographically distributed clients. This makes them a good choice for public services being accessed from the internet. Regional endpoints are typically used for APIs that are accessed primarily from within the same AWS Region.)
- Choose the blue Create API button. Your settings should look like the accompanying screenshot.



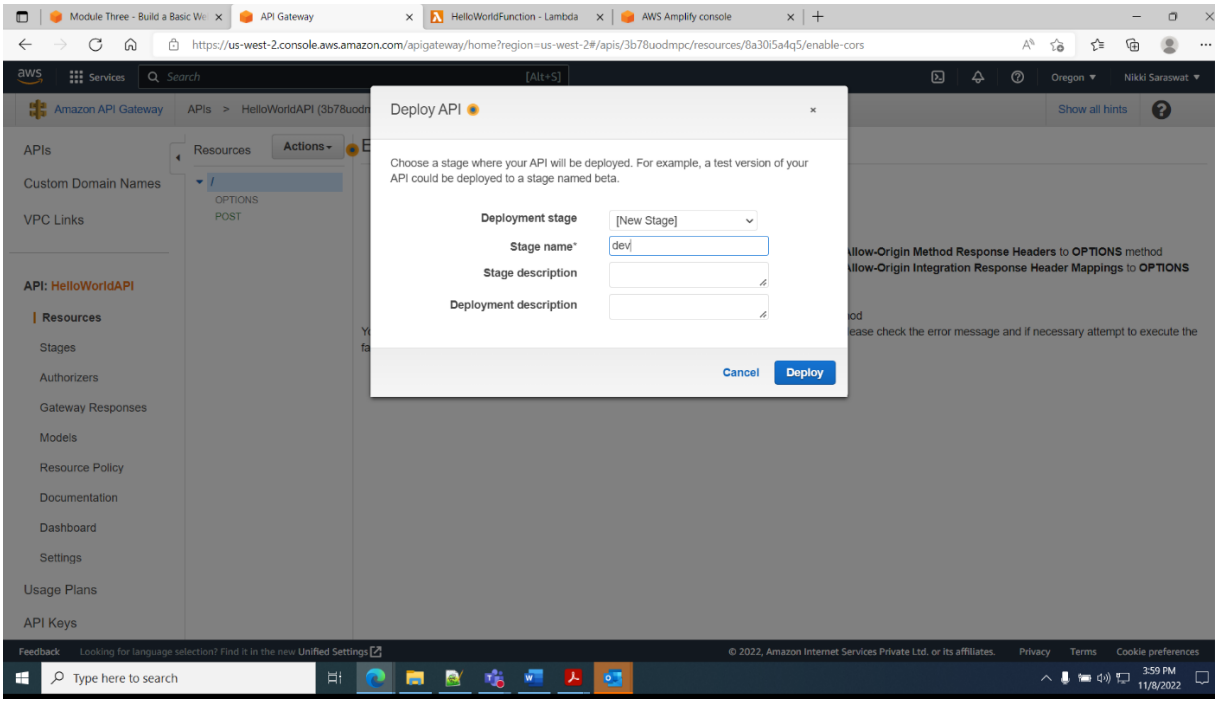
- In the left navigation pane, select Resources under API: HelloWorldAPI.
- Ensure the "/" resource is selected.
- From the Actions dropdown menu, select Create Method.
- Select POST from the new dropdown that appears, then select the checkmark.
- Select Lambda Function for the Integration type.
- Select the Lambda Region you used when making the function (or else you will see a warning box reading "You do not have any Lambda Functions in...").
- Enter HelloWorldFunction in the Lambda Function field.
- Choose the blue Save button.
- You should see a message letting you know you are giving the API you are creating permission to call your Lambda function. Choose the OK button.
- With the newly created POST method selected, select Enable CORS from the Action dropdown menu.
- Leave the POST checkbox selected and choose the blue Enable CORS and replace existing CORS headers button.



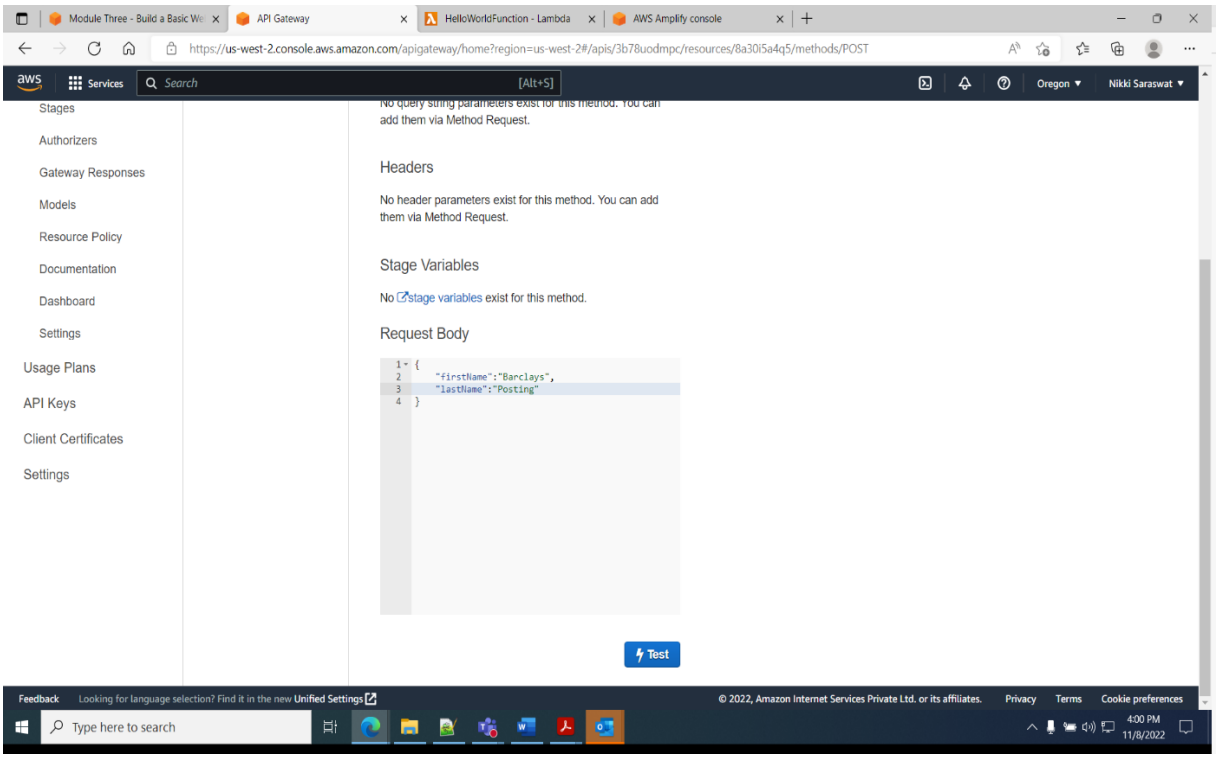
- You should see a message asking you to confirm method changes. Choose the blue Yes, replace existing values button.

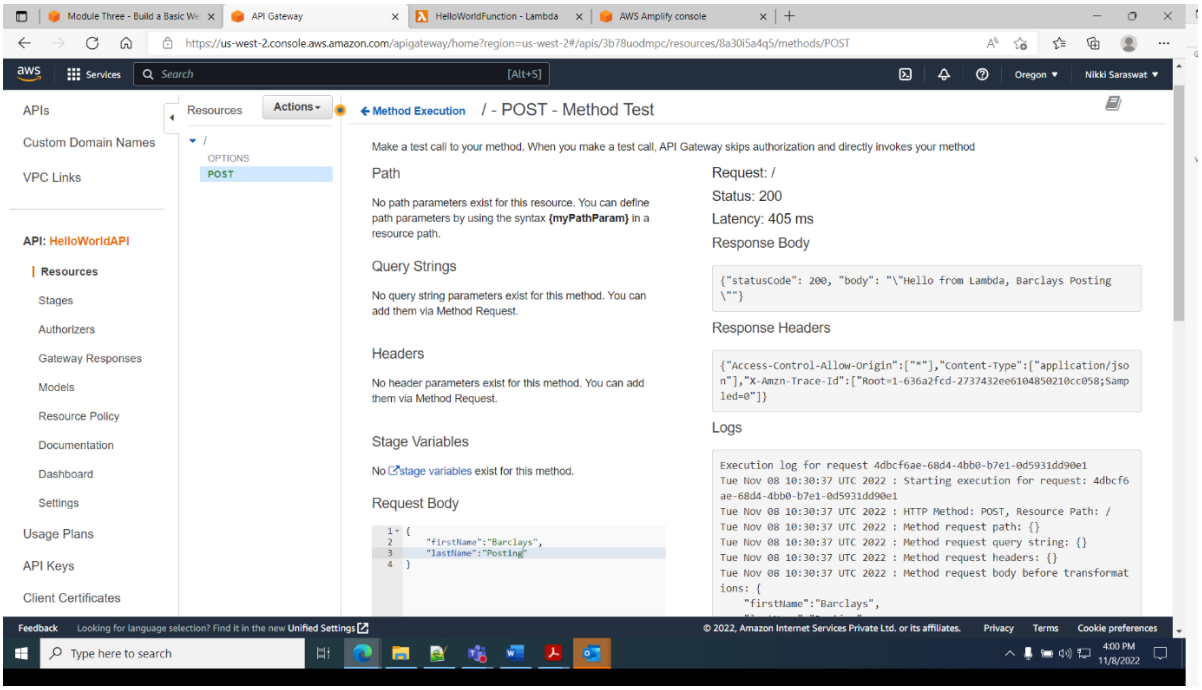


- In the Actions dropdown list, select Deploy API.
- Select [New Stage] in the Deployment stage dropdown list.
- Enter dev for the Stage Name.
- Choose Deploy.
- Copy and save the URL next to Invoke URL (you will need it in module five).



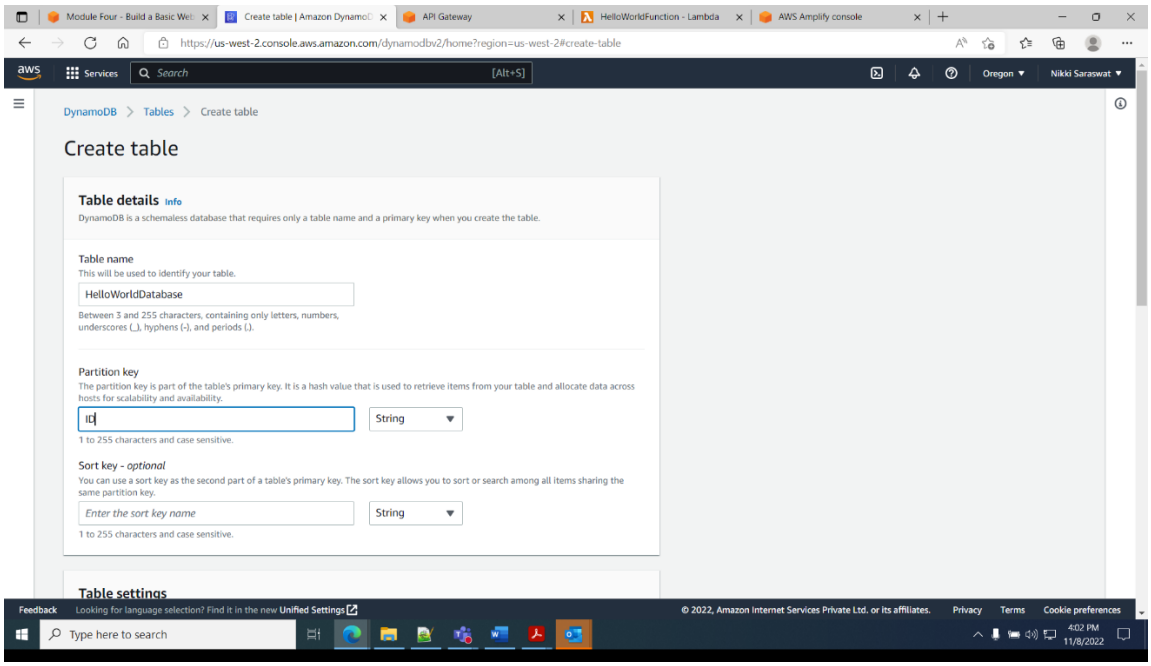
- In the left navigation pane, select Resources.
- The methods for our API will now be listed on the right. Choose POST.
- Choose the small blue lightning bolt.
- Paste the following into the Request Body field:
- Choose the blue Test button.
- On the right side, you should see a response with Code 200.
- Great! We have built and tested an API that calls our Lambda function.

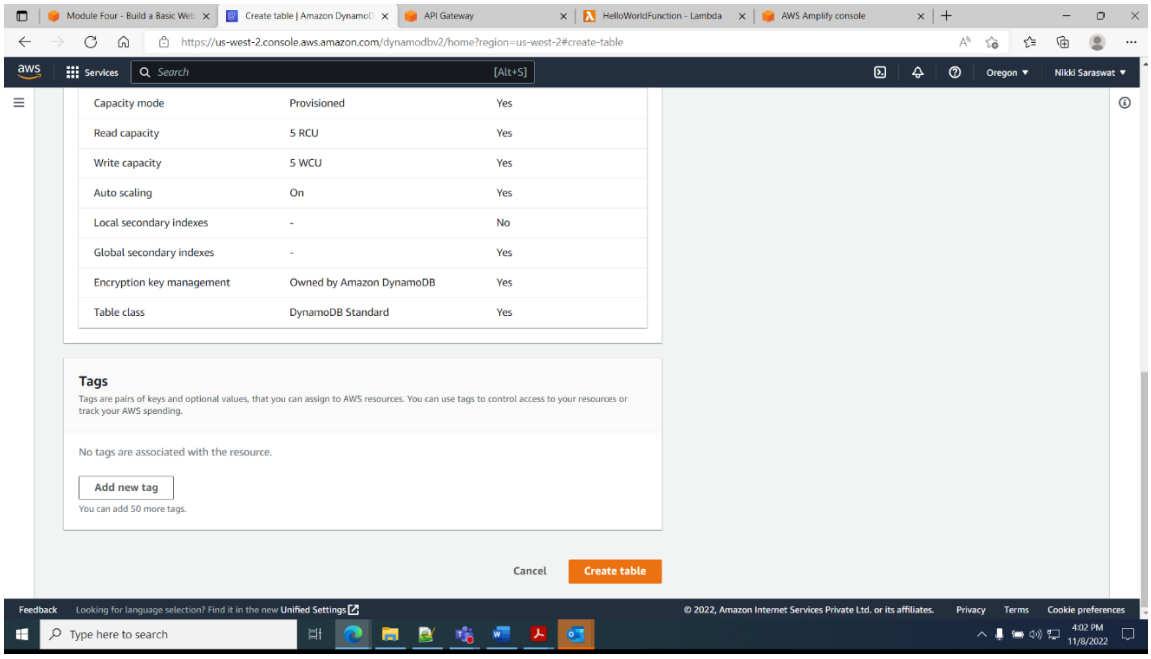


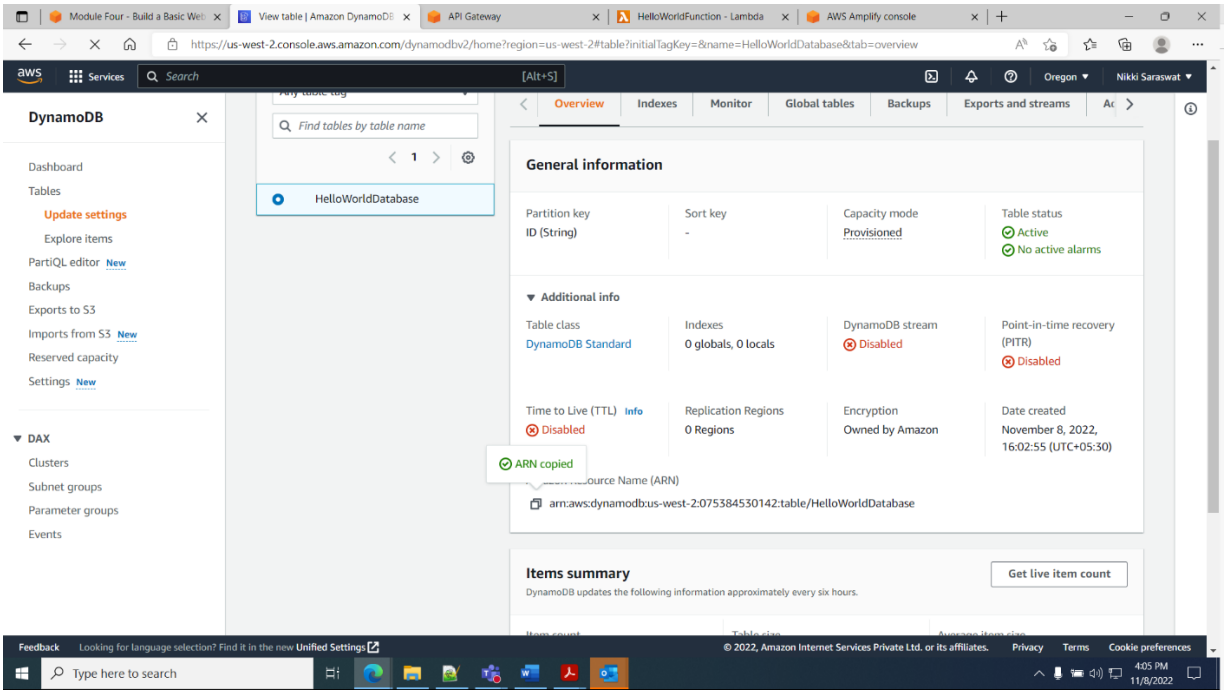


4. Create a Data Table
    - Log in to the Amazon DynamoDB console.
    - Make sure you create your table in the same Region in which you created the web app in the previous module. You can see this at the very top of the page, next to your account name.

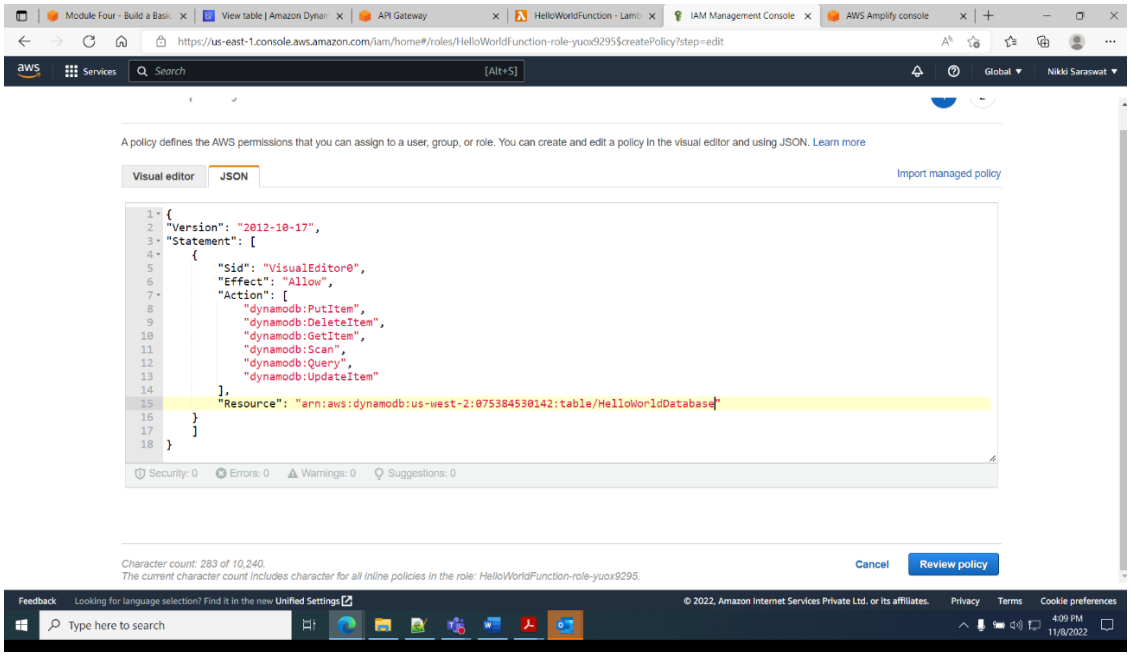
- Choose the orange Create table button.
- Under Table name, enter HelloWorldDatabase.
- In the Partition key field, enter ID. The partition key is part of the table's primary key.
- Leave the rest of the default values unchanged and choose the orange Create table button.
- In the list of tables, select the table name, HelloWorldDatabase.
- In the General information section, show Additional info by selecting the down arrow.
- Copy the Amazon Resource Name (ARN). You will need it later in this module.

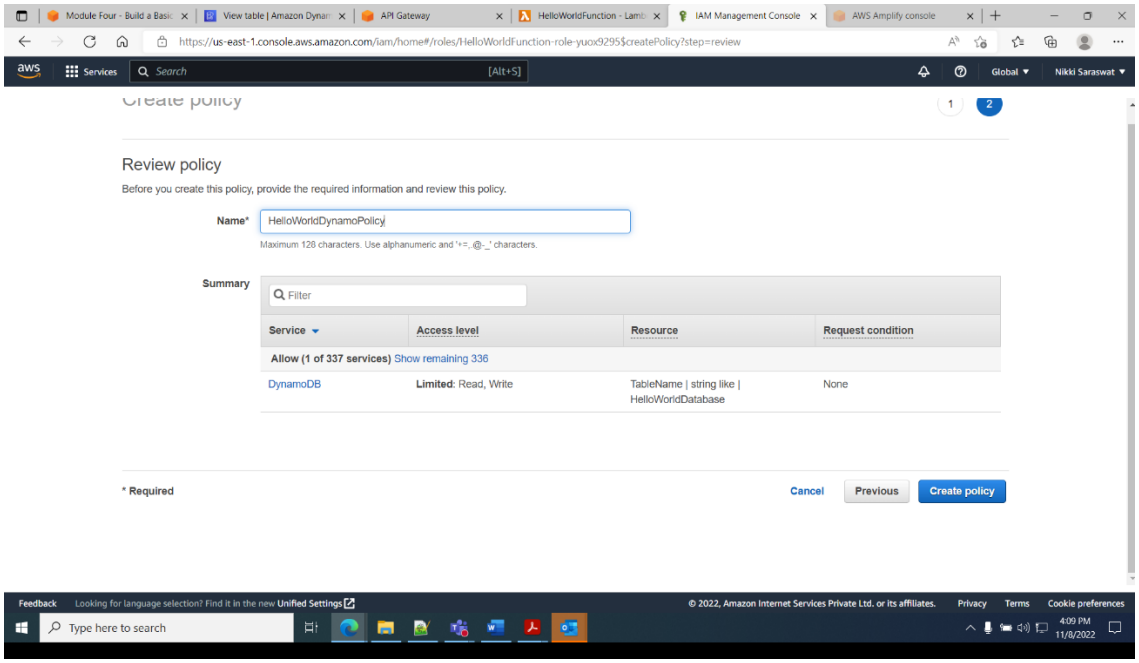




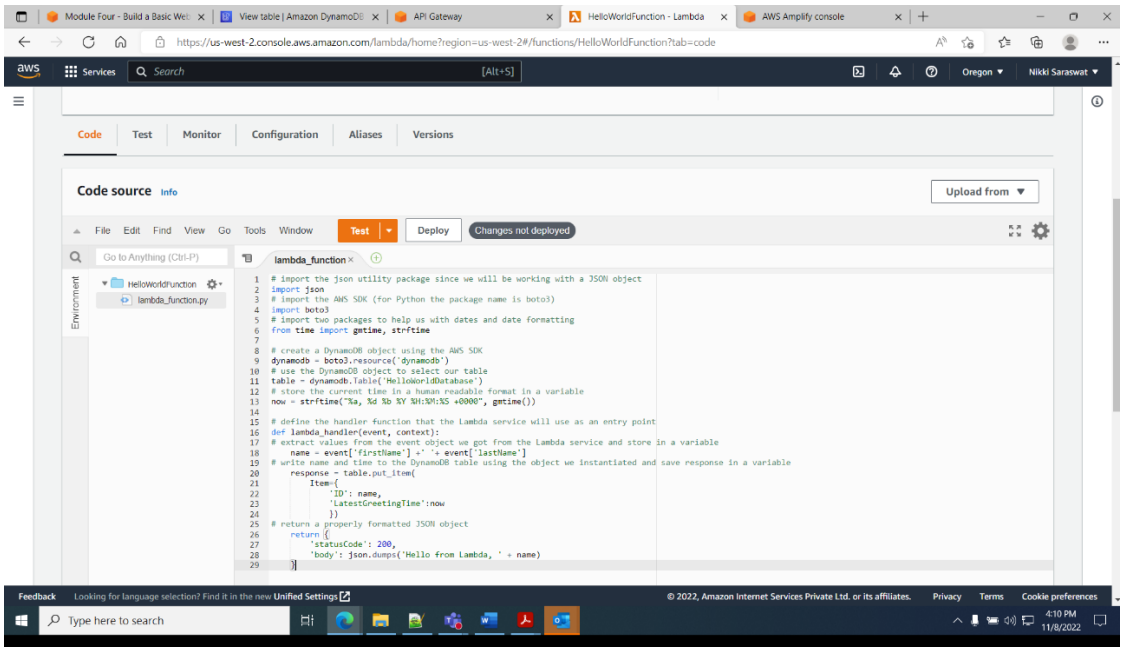


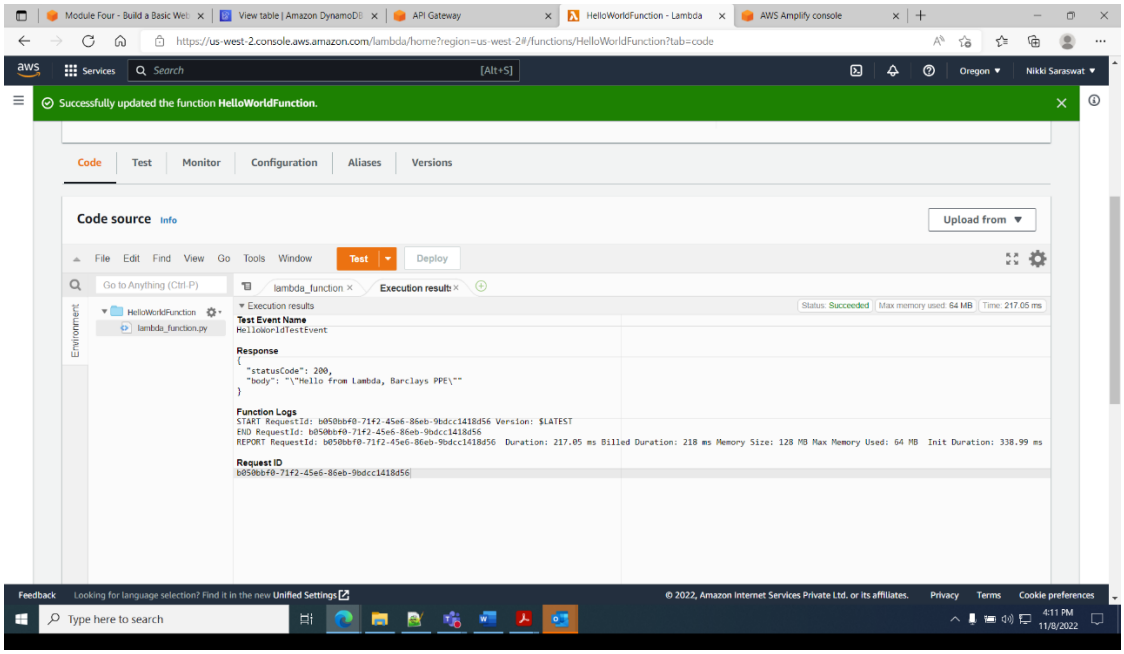
- Now that we have a table, let's edit our Lambda function to be able to write data to it. In a new browser window, open the AWS Lambda console.
- Select the function we created in module two (if you have been using our examples, it will be called HelloWorldFunction). If you don't see it, check the Region dropdown in the upper right next to your name to ensure you're in the same Region you created the function in.
- We'll be adding permissions to our function so it can use the DynamoDB service, and we'll be using AWS Identity and Access Management (IAM) to do so.
- Select the Configuration tab and select Permissions from the right side menu.
- In the Execution role box, under Role name, choose the link. A new browser tab will open.
- In the Permissions policies box, open the Add permissions dropdown and select Create inline policy.
- Select the JSON tab.
- Paste the following policy in the text area, taking care to replace your table's ARN in the Resource field in line 15:
- This policy will allow our Lambda function to read, edit, or delete items, but restrict it to only be able to do so in the table we created.
- Choose the blue Review Policy button.
- Next to Name, enter HelloWorldDynamoPolicy.
- Choose the blue Create Policy button.
- You can now close this browser tab and go back to the tab for your Lambda function.

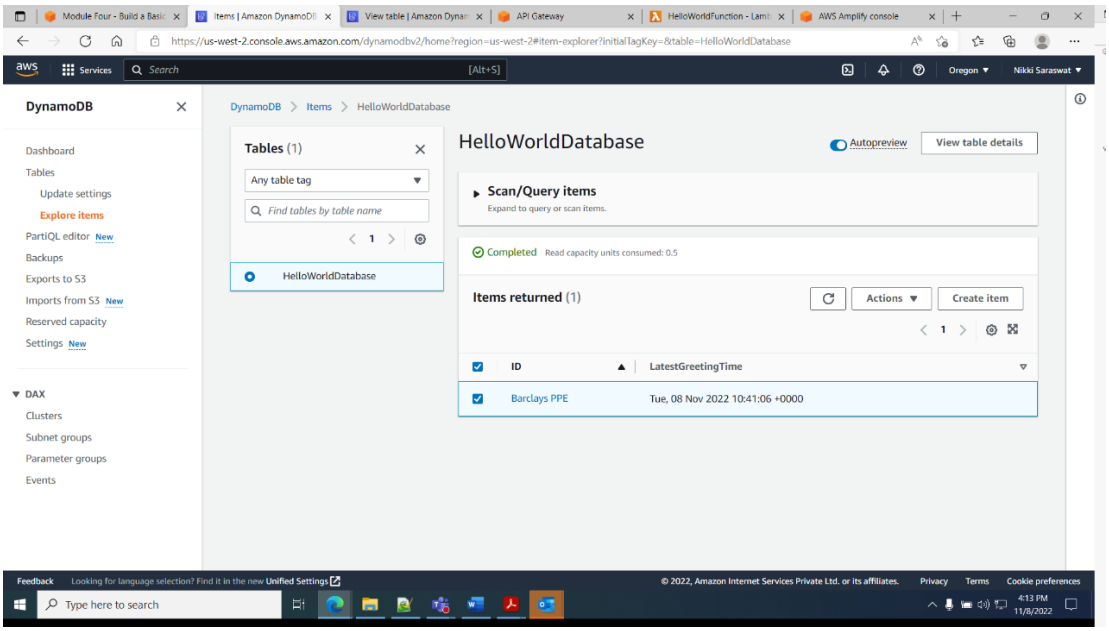




- Select the Code tab and select your function from the navigation pane on the left side of the code editor.
- Replace the code for your function with the following:
- Choose the Deploy button at the top of the code editor.


Module Four - Build a Basic Web
View table | Amazon DynamoDB
API Gateway
HelloWorldFunction - Lambda
AWS Amplify console
https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/HelloWorldFunction?tab=code
Services
Search
[Alt+S]
Oregon
Nikki Saraswat
Code
Test
Monitor
Configuration
Aliases
Versions
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Changes not deployed
Go to Anything (Ctrl-P)
lambda_function
HelloWorldFunction
lambda_function.py
Environment
# import the json utility package since we will be working with a JSON object
import json
# import the AWS SDK (for Python the package name is boto3)
import boto3
# import two packages to help us with dates and date formatting
from time import gmtime, strftime
# create a DynamoDB object using the AWS SDK
dynamodb = boto3.resource('dynamodb')
# use the DynamoDB object to select our table
table = dynamodb.Table('HelloWorldDatabase')
# store the current time in a human readable format in a variable
now = strftime("%a, %d %b %Y %H:%M:%S +0000", gmtime())
# define the handler function that the Lambda service will use as an entry point
def lambda_handler(event, context):
# extract values from the event object we got from the Lambda service and store in a variable
name = event['firstName'] +' '+ event['lastName']
# write name and time to the DynamoDB table using the object we instantiated and save response in a variable
response = table.put_item(
Item={
'ID': name,
'LatestGreetingTime':now
})
# return a properly formatted JSON object
return {
'statusCode': 200,
'body': json.dumps('Hello from Lambda, ' + name)
}
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Internet Services Private Ltd. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
4:10 PM
11/8/2022


Module Four - Build a Basic Web
View table | Amazon DynamoDB
API Gateway
HelloWorldFunction - Lambda
AWS Amplify console
https://us-west-2.console.aws.amazon.com/lambda/home?region=us-west-2#/functions/HelloWorldFunction?tab=code
Services
Search
[Alt+S]
Oregon
Nikki Saraswat
Successfully updated the function HelloWorldFunction.
Code
Test
Monitor
Configuration
Aliases
Versions
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Go to Anything (Ctrl-P)
lambda_function
Execution result
HelloWorldFunction
lambda_function.py
Environment
Execution results
Status: Succeeded
Max memory used: 64 MB
Time: 217.05 ms
Test Event Name
HelloWorldTestEvent
Response
{
"statusCode": 200,
"body": "\"Hello from Lambda, Barclays PPE\""
}
Function Logs
START RequestId: b050bbf0-71f2-45e6-86eb-9bdcc1418d56 Version: $LATEST
END RequestId: b050bbf0-71f2-45e6-86eb-9bdcc1418d56
REPORT RequestId: b050bbf0-71f2-45e6-86eb-9bdcc1418d56 Duration: 217.05 ms Billed Duration: 218 ms Memory Size: 128 MB Max Memory Used: 64 MB Init Duration: 338.99 ms
Request ID
b050bbf0-71f2-45e6-86eb-9bdcc1418d56
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Internet Services Private Ltd. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search
4:11 PM
11/8/2022

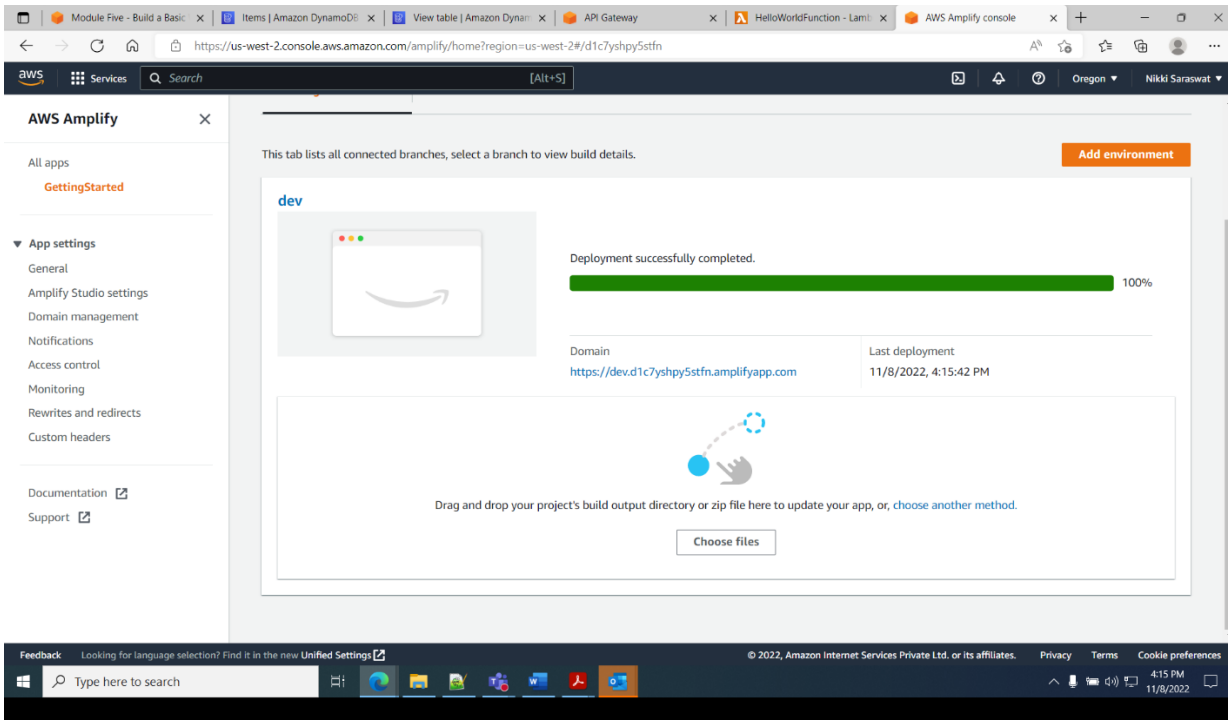


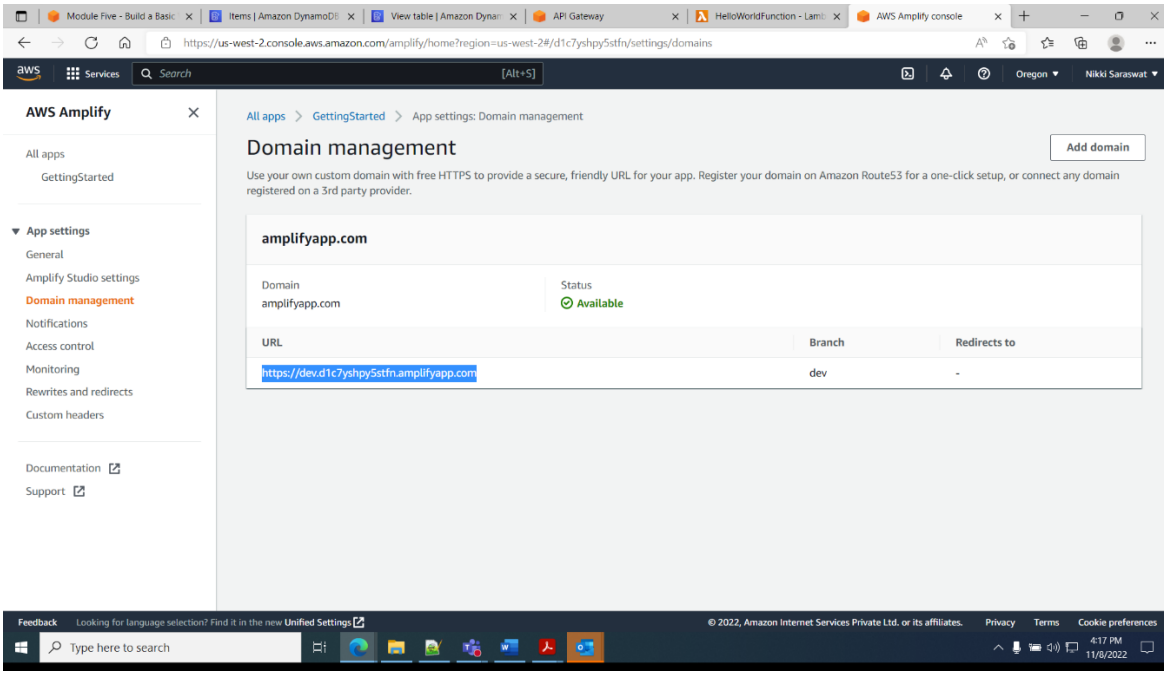
5. Add Interactivity to Your Web App
    - Open the index.html file you created in module one.
    - Replace the existing code with the following:

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="UTF-8">
  <title>Hello World</title>
  <!-- Add some CSS to change client UI -->
  <style>
  body {
    background-color: #232F3E;
    }
  label, button {
    color: #FF9900;
    font-family: Arial, Helvetica, sans-serif;
    font-size: 20px;
    margin-left: 40px;
    }
   input {
    color: #232F3E;
    font-family: Arial, Helvetica, sans-serif;
    font-size: 20px;
    margin-left: 20px;
    }
  </style>
  <script>
    // define the callAPI function that takes a first name and last name as parameters
    var callAPI = (firstName,lastName)=>{
      // instantiate a headers object
      var myHeaders = new Headers();
      // add content type header to object
      myHeaders.append("Content-Type", "application/json");
```

```
        // using built in JSON utility package turn object to string and store in a variable
        var raw = JSON.stringify({"firstName":firstName,"lastName":lastName});
        // create a JSON object with parameters for API call and store in a variable
        var requestOptions = {
          method: 'POST',
          headers: myHeaders,
          body: raw,
          redirect: 'follow'
        };
        // make API call with parameters and use promises to get response
        fetch("YOUR-API-INVOKE-URL", requestOptions)
        .then(response => response.text())
        .then(result => alert(JSON.parse(result).message))
        .catch(error => console.log('error', error));
      }
  </script>
</head>
<body>
  <form>
    <label>First Name :</label>
    <input type="text" id="fName">
    <label>Last Name :</label>
    <input type="text" id="lName">
    <!-- set button onClick method to call function we defined passing input values as parameters -->
    <button type="button"
onclick="callAPI(document.getElementById('fName').value,document.getElementById('lName').value)">Call
API</button>
  </form>
</body>
</html>
```

- Make sure you add your API Invoke URL on Line 41 (from module three). Note: If you do not have your API's URL, you can get it from the API Gateway console by selecting your API and choosing stages.
- Save the file.
- ZIP (compress) only the HTML file.
- Open the Amplify console.
- Choose the web app created in module one.
- Choose the white Choose files button.
- Select the ZIP file you created in Step 5.
- When the file is uploaded, a deployment process will automatically begin. Once you see a greenbar, your deployment will be complete.

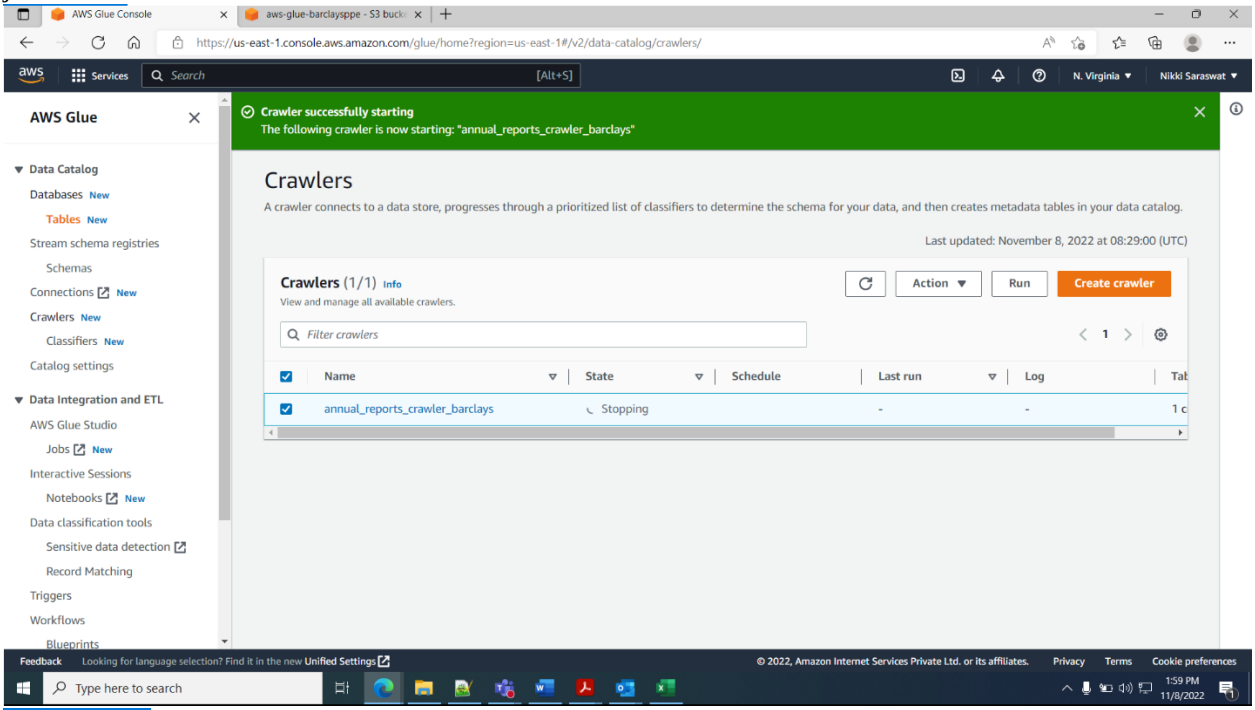


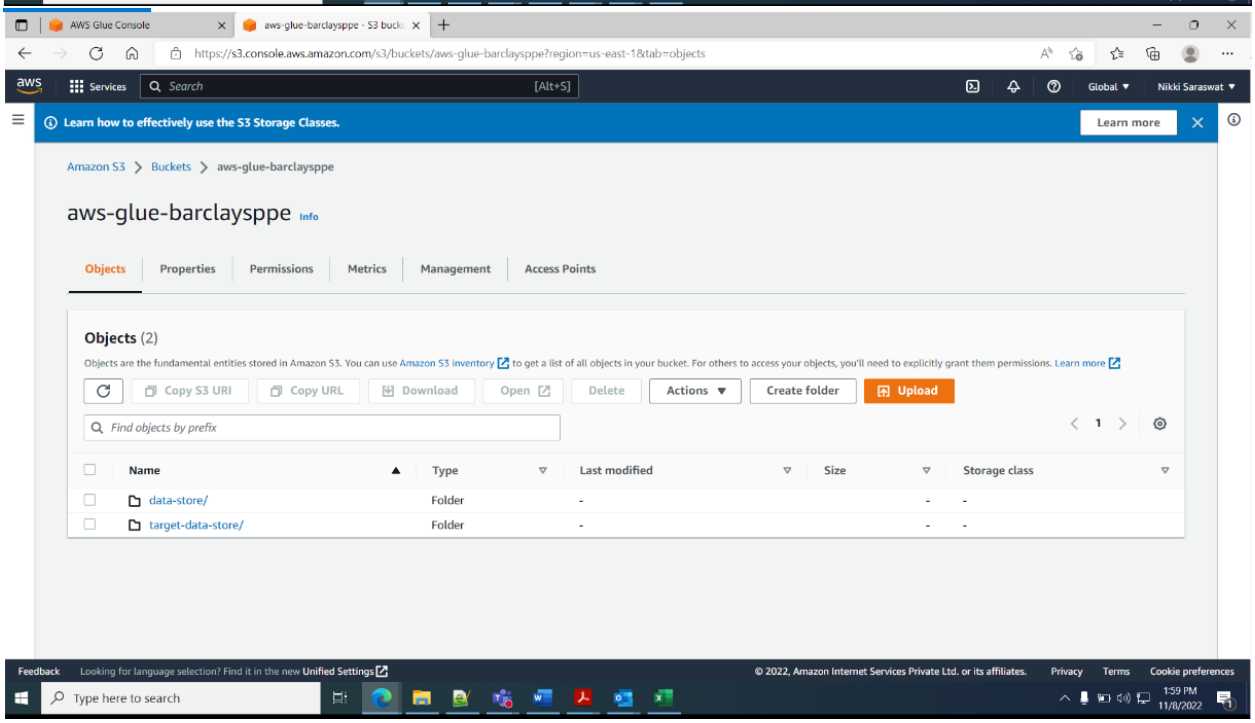


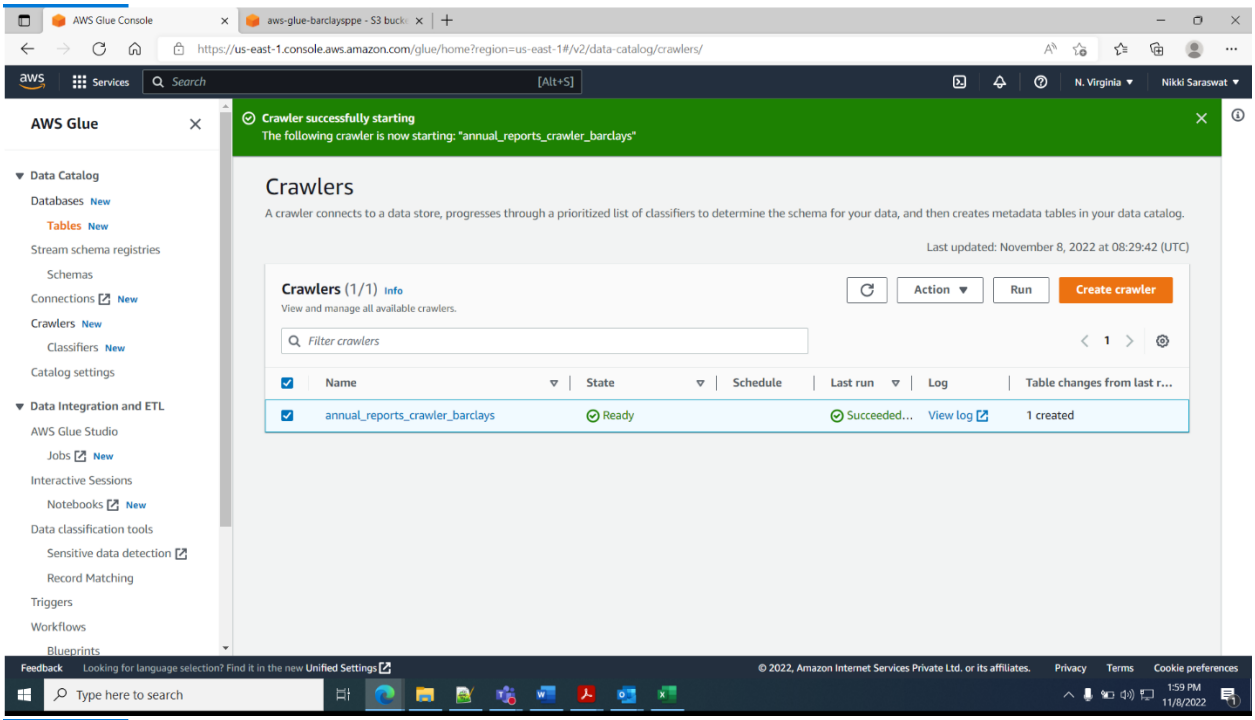
Assignment 03: GLUE CRAWLER

- Creation of IAM Role for Glue with AWSGlueServiceRole and S3FullAccess Permission

- Now, IN S3 directory structure needs to be created. First directory will be created along with uploaded csv file. Second Structure will be created without any file.
- Now in Glue, database configuration, table information and manage glue studio for declaring jobs needs to be done.






AWS Glue Console
aws-glue-barclaysppe - S3 buck
https://us-east-1.console.aws.amazon.com/glue/home?region=us-east-1#/v2/data-catalog/crawlers/
Services
Search
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AWS Glue
Crawler successfully starting
The following crawler is now starting: "annual_reports_crawler_barclays"
Data Catalog
Databases New
Tables New
Stream schema registries
Schemas
Connections New
Crawlers New
Classifiers New
Catalog settings
Data Integration and ETL
AWS Glue Studio
Jobs New
Interactive Sessions
Notebooks New
Data classification tools
Sensitive data detection
Record Matching
Triggers
Workflows
Blueprints
Crawlers
A crawler connects to a data store, progresses through a prioritized list of classifiers to determine the schema for your data, and then creates metadata tables in your data catalog.
Last updated: November 8, 2022 at 08:29:42 (UTC)
Crawlers (1/1) Info
View and manage all available crawlers.
Action
Run
Create crawler
Filter crawlers
Name
State
Schedule
Last run
Log
Table changes from last r...
annual_reports_crawler_barclays
Ready
Succeeded...
View log
1 created
Feedback
Looking for language selection? Find it in the new Unified Settings
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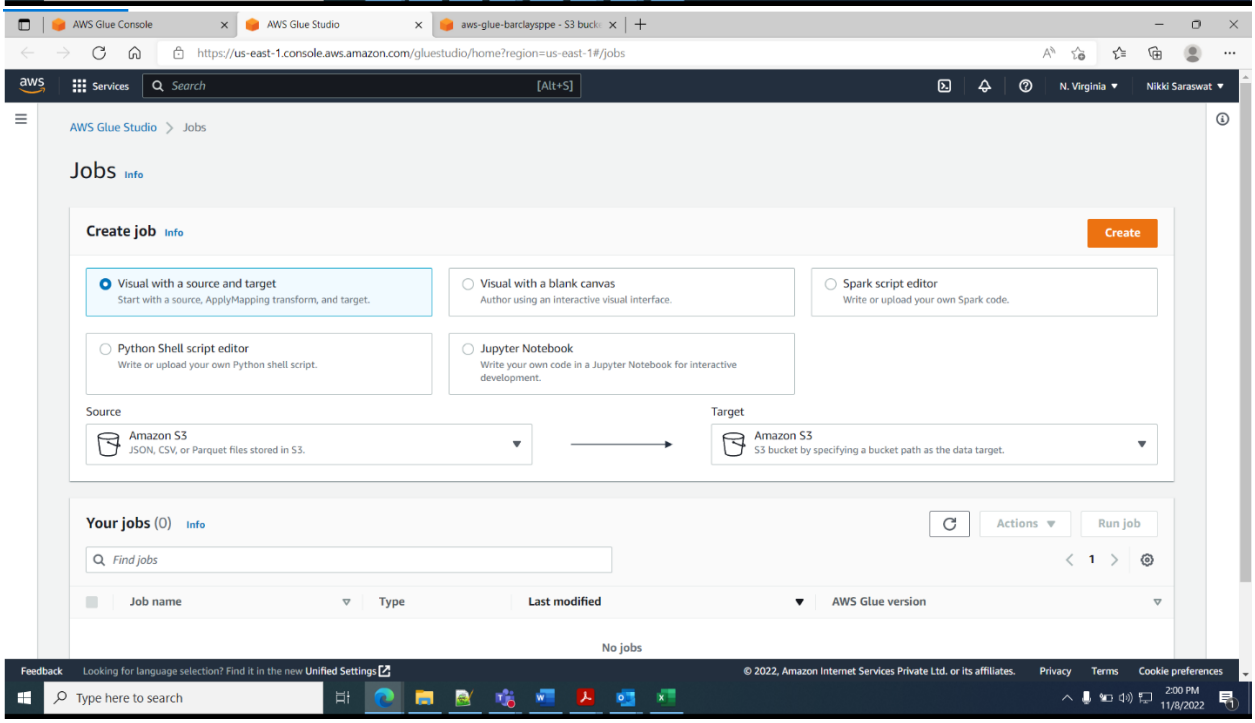
Type here to search
1:59 PM
11/8/2022


AWS Glue Console
AWS Glue Studio
aws-glue-barclaysppe - S3 buck
https://us-east-1.console.aws.amazon.com/gluestudio/home?region=us-east-1#/jobs
Services
Search
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N. Virginia
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AWS Glue Studio > Jobs
Jobs Info
Create job Info
Create
Visual with a source and target
Start with a source, ApplyMapping transform, and target.
Visual with a blank canvas
Author using an interactive visual interface.
Spark script editor
Write or upload your own Spark code.
Python Shell script editor
Write or upload your own Python shell script.
Jupyter Notebook
Write your own code in a Jupyter Notebook for interactive development.
Source
Amazon S3
JSON, CSV, or Parquet files stored in S3.
Target
Amazon S3
S3 bucket by specifying a bucket path as the data target.
Your jobs (0) Info
Actions
Run job
Find jobs
Job name
Type
Last modified
AWS Glue version
No jobs
Feedback
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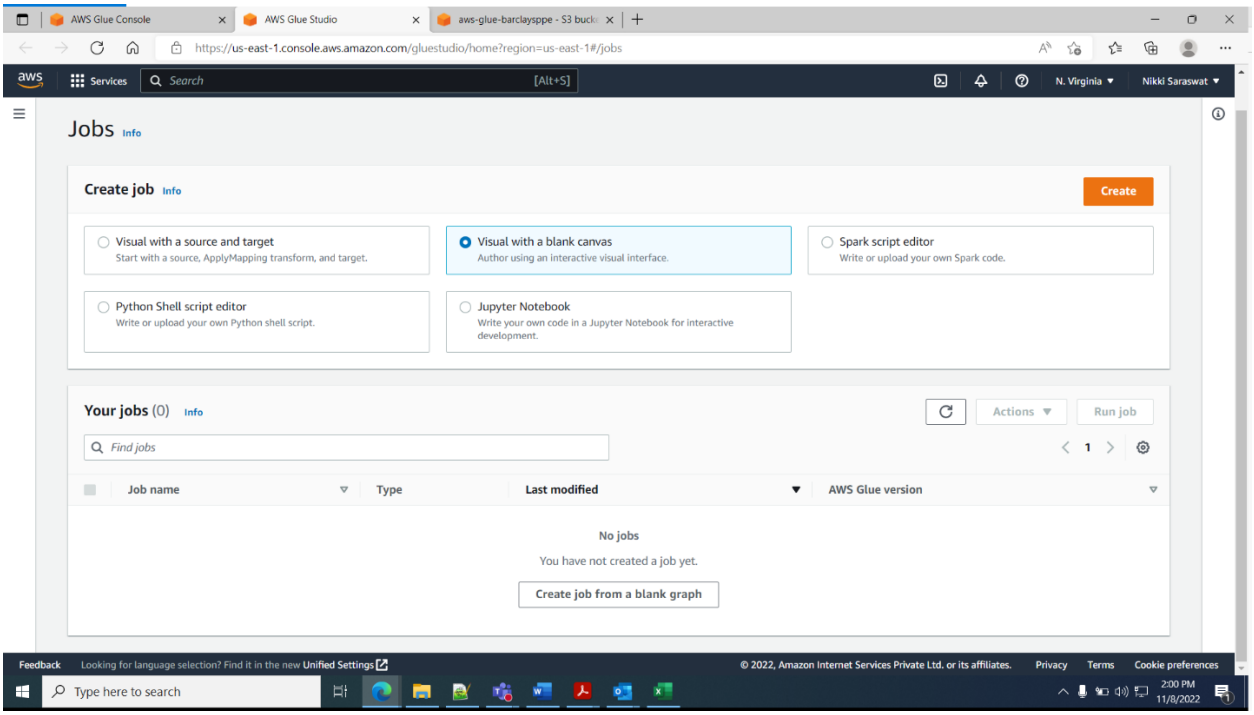
AWS Glue Console
AWS Glue Studio
aws-glue-barclaysppe - S3 buck
https://us-east-1.console.aws.amazon.com/gluestudio/home?region=us-east-1#/jobs
aws
Services
Search
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Jobs Info
Create job Info
Create
Visual with a source and target
Start with a source, ApplyMapping transform, and target.
Visual with a blank canvas
Author using an interactive visual interface.
Spark script editor
Write or upload your own Spark code.
Python Shell script editor
Write or upload your own Python shell script.
Jupyter Notebook
Write your own code in a Jupyter Notebook for interactive development.
Your jobs (0) Info
Actions
Run job
Find jobs
1
Job name
Type
Last modified
AWS Glue version
No jobs
You have not created a job yet.
Create job from a blank graph
Feedback
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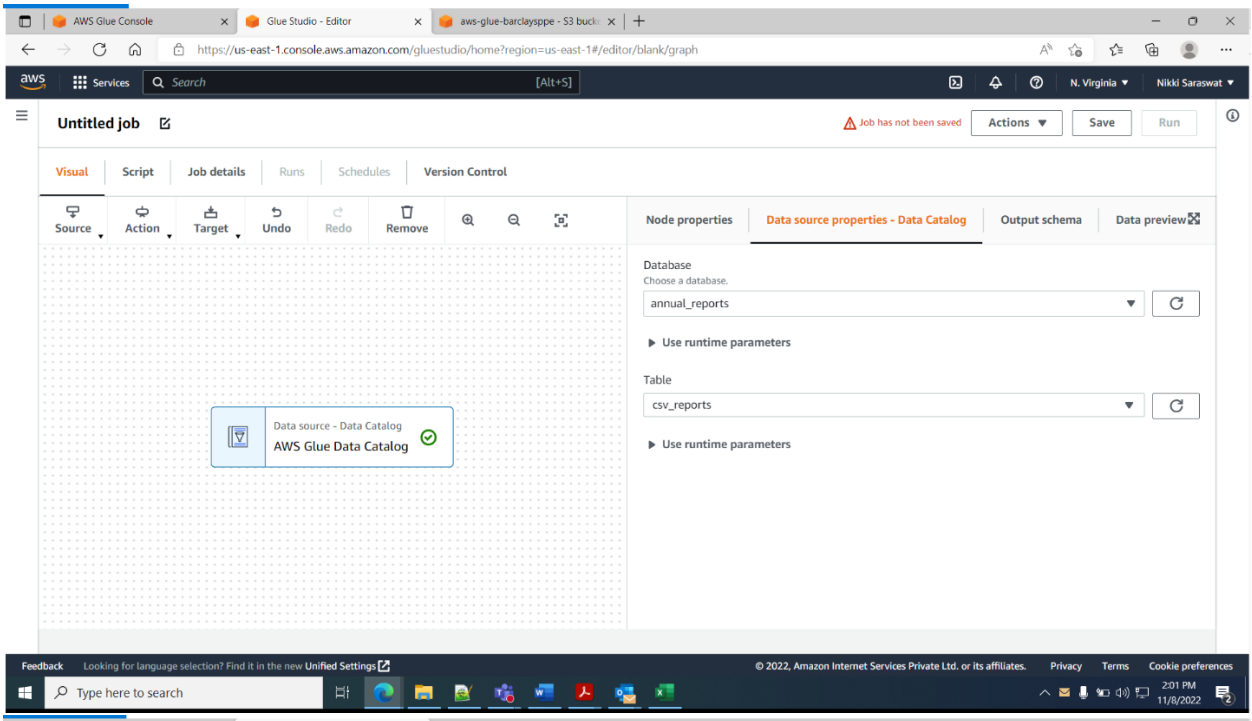
AWS Glue Console
Glue Studio - Editor
https://us-east-1.console.aws.amazon.com/gluestudio/home?region=us-east-1#/editor/blank/graph
Services
Search
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Untitled job
Job has not been saved
Actions
Save
Run
Visual
Script
Job details
Runs
Schedules
Version Control
Source
Action
Target
Undo
Redo
Remove
Node properties
Data source properties - Data Catalog
Output schema
Data preview
Database
Choose a database.
annual_reports
Use runtime parameters
Table
csv_reports
Use runtime parameters
Data source - Data Catalog
AWS Glue Data Catalog
Feedback
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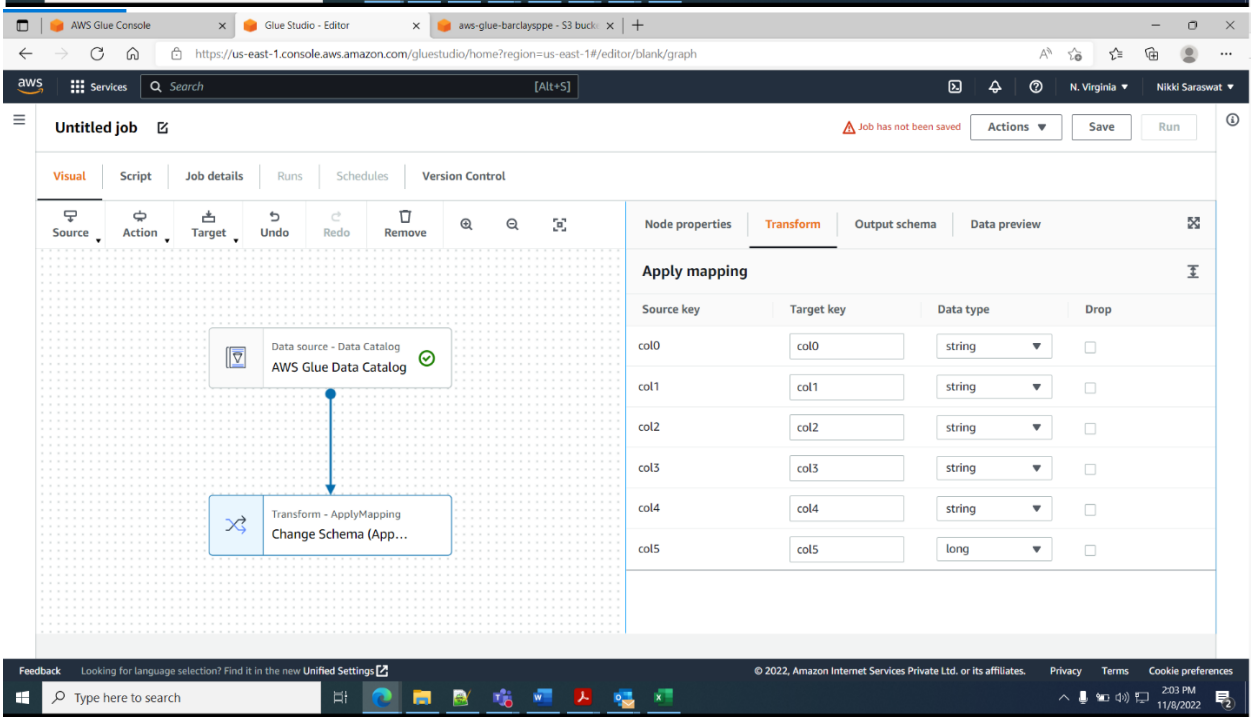
AWS Glue Console
Glue Studio - Editor
https://us-east-1.console.aws.amazon.com/gluestudio/home?region=us-east-1#/editor/blank/graph
Services
Search
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Untitled job
Job has not been saved
Actions
Save
Run
Visual
Script
Job details
Runs
Schedules
Version Control
Source
Action
Target
Undo
Redo
Remove
Node properties
Transform
Output schema
Data preview
Apply mapping
Source key
Target key
Data type
Drop
col0
col0
string
col1
col1
string
col2
col2
string
col3
col3
string
col4
col4
string
col5
col5
long
Data source - Data Catalog
AWS Glue Data Catalog
Transform - ApplyMapping
Change Schema (App...
Feedback
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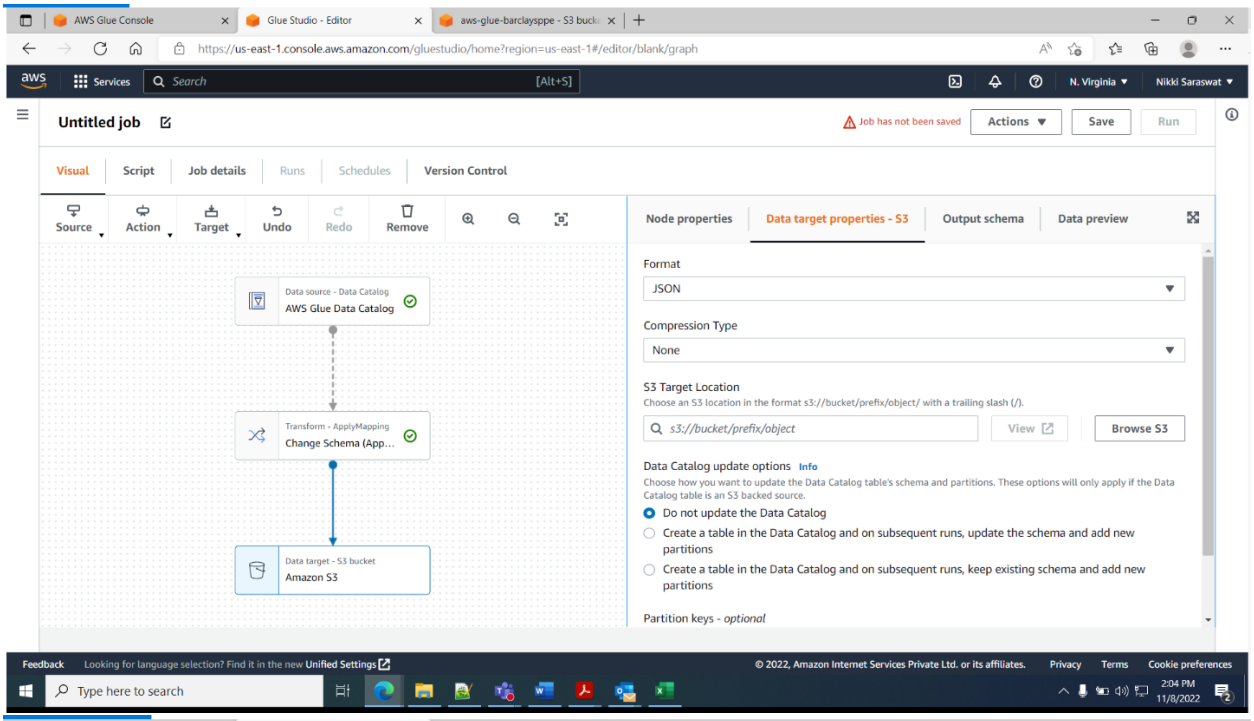
AWS Glue Console
Glue Studio - Editor
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Services
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Untitled job
Job has not been saved
Actions
Save
Run
Visual
Script
Job details
Runs
Schedules
Version Control
Source
Action
Target
Undo
Redo
Remove
Data source - Data Catalog
AWS Glue Data Catalog
Transform - ApplyMapping
Change Schema (App...
Data target - S3 bucket
Amazon S3
Node properties
Data target properties - S3
Output schema
Data preview
Format
JSON
Compression Type
None
S3 Target Location
Choose an S3 location in the format s3://bucket/prefix/object/ with a trailing slash (/).
s3://bucket/prefix/object
View
Browse S3
Data Catalog update options Info
Choose how you want to update the Data Catalog table's schema and partitions. These options will only apply if the Data Catalog table is an S3 backed source.
Do not update the Data Catalog
Create a table in the Data Catalog and on subsequent runs, update the schema and add new partitions
Create a table in the Data Catalog and on subsequent runs, keep existing schema and add new partitions
Partition keys - optional
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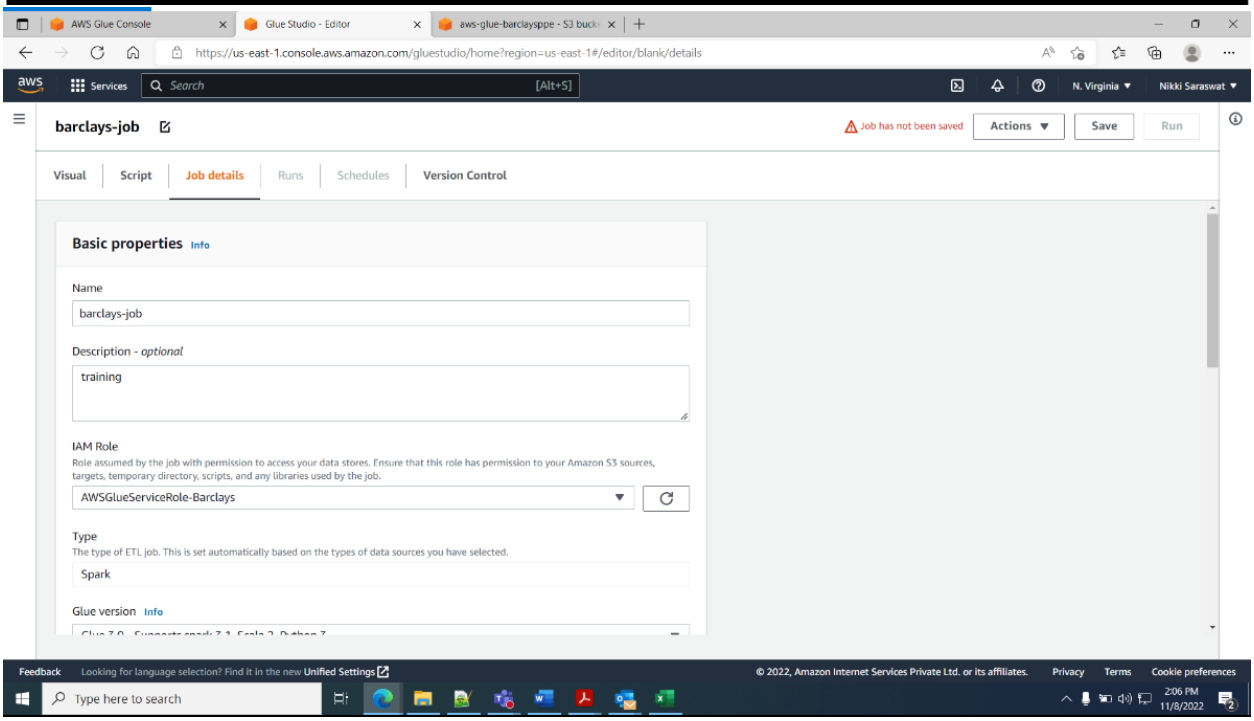
AWS Glue Console
Glue Studio - Editor
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barclays-job
Job has not been saved
Actions
Save
Run
Visual
Script
Job details
Runs
Schedules
Version Control
Basic properties Info
Name
barclays-job
Description - optional
training
IAM Role
Role assumed by the job with permission to access your data stores. Ensure that this role has permission to your Amazon S3 sources, targets, temporary directory, scripts, and any libraries used by the job.
AWSGlueServiceRole-Barclays
Type
The type of ETL job. This is set automatically based on the types of data sources you have selected.
Spark
Glue version Info
Feedback
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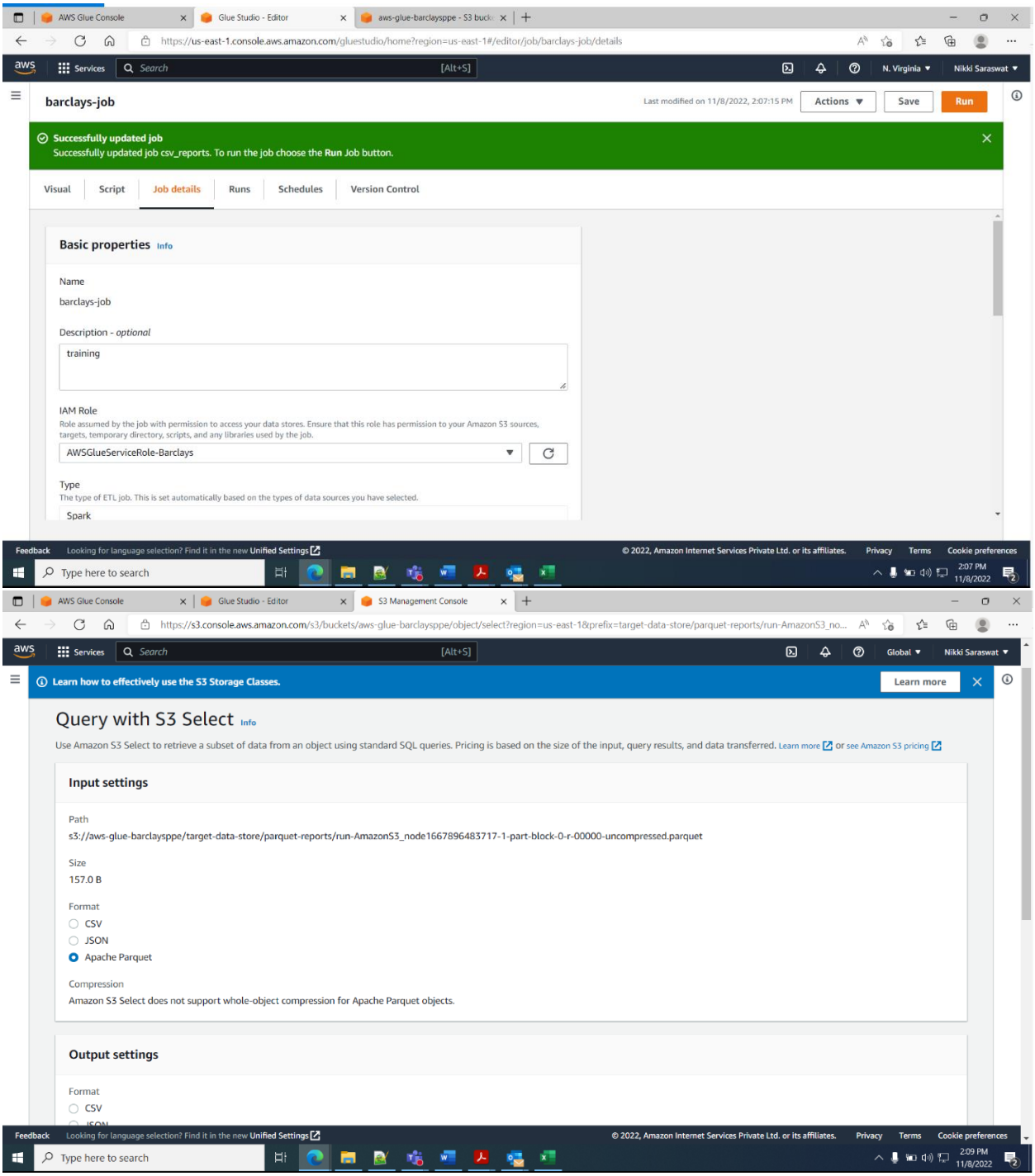
AWS Glue Console
Glue Studio - Editor
aws-glue-barclayspe - S3 buck
https://us-east-1.console.aws.amazon.com/gluestudio/home?region=us-east-1#/editor/job/barclays-job/details
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barclays-job
Last modified on 11/8/2022, 2:07:15 PM
Actions
Save
Run
Successfully updated job
Successfully updated job csv_reports. To run the job choose the Run Job button.
Visual
Script
Job details
Runs
Schedules
Version Control
Basic properties Info
Name
barclays-job
Description - optional
training
IAM Role
Role assumed by the job with permission to access your data stores. Ensure that this role has permission to your Amazon S3 sources, targets, temporary directory, scripts, and any libraries used by the job.
AWSGlueServiceRole-Barclays
Type
The type of ETL job. This is set automatically based on the types of data sources you have selected.
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S3 Management Console
https://s3.console.aws.amazon.com/s3/buckets/aws-glue-barclayspe/object/select?region=us-east-1&prefix=target-data-store/parquet-reports/run-AmazonS3_no...
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Learn how to effectively use the S3 Storage Classes.
Learn more
Query with S3 Select Info
Use Amazon S3 Select to retrieve a subset of data from an object using standard SQL queries. Pricing is based on the size of the input, query results, and data transferred. Learn more or see Amazon S3 pricing
Input settings
Path
s3://aws-glue-barclayspe/target-data-store/parquet-reports/run-AmazonS3_node1667896483717-1-part-block-0-r-00000-uncompressed.parquet
Size
157.0 B
Format
CSV
JSON
Apache Parquet
Compression
Amazon S3 Select does not support whole-object compression for Apache Parquet objects.
Output settings
Format
CSV
Feedback
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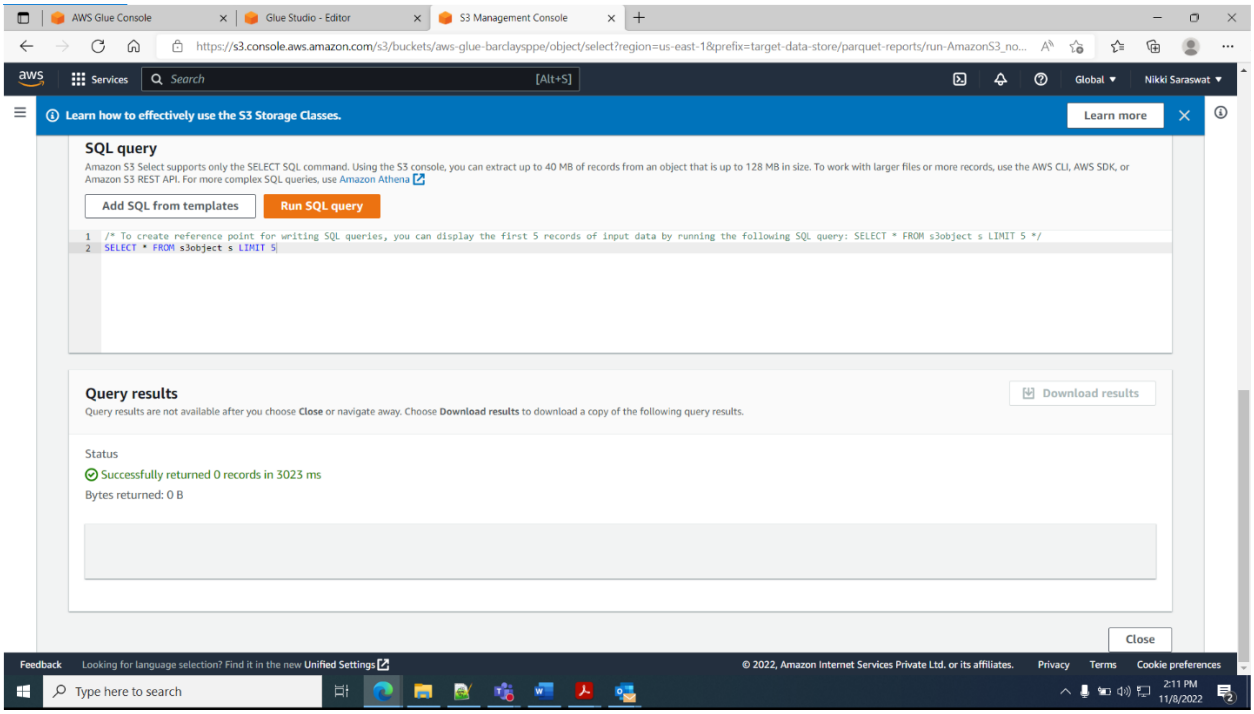
AWS Glue Console
Glue Studio - Editor
S3 Management Console
https://s3.console.aws.amazon.com/s3/buckets/aws-glue-barclaysppe/object/select?region=us-east-1&prefix=target-data-store/parquet-reports/run-AmazonS3_no...
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Learn how to effectively use the S3 Storage Classes.
Learn more
SQL query
Amazon S3 Select supports only the SELECT SQL command. Using the S3 console, you can extract up to 40 MB of records from an object that is up to 128 MB in size. To work with larger files or more records, use the AWS CLI, AWS SDK, or Amazon S3 REST API. For more complex SQL queries, use Amazon Athena
Add SQL from templates
Run SQL query
1 /* To create reference point for writing SQL queries, you can display the first 5 records of input data by running the following SQL query: SELECT * FROM s3object s LIMIT 5 */
2 SELECT * FROM s3object s LIMIT 5
Query results
Query results are not available after you choose Close or navigate away. Choose Download results to download a copy of the following query results.
Download results
Status
Successfully returned 0 records in 3023 ms
Bytes returned: 0 B
Close
Feedback
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Type here to search
2:11 PM
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