**Animesh Parab T2-T21 88**

**ASSIGNMENT-9**

## AIM:- To understand AWS Lambda functions

## LO MAPPED: LO1, LO5

## THEORY:

AWS Lambda is a serverless compute service provided by Amazon Web Services (AWS) that enables you to run code in response to various events without the need to manage servers. It's a key component of AWS's serverless computing offerings. To understand the theory behind AWS Lambda functions, let's break it down into its core concepts:

**Serverless Computing:**

Serverless computing is a cloud computing model where cloud providers (like AWS) manage the infrastructure for you, allowing you to focus solely on your code.

**Lambda Function:**

A Lambda function is the fundamental unit of execution in AWS Lambda. It is a piece of code that can be executed in response to events such as HTTP requests, file uploads, database changes, etc. Lambda supports multiple programming languages, including Node.js, Python, Java, and more.

**Event Sources:**

Lambda functions are triggered by events. These events can come from various AWS services, like Amazon S3, Amazon DynamoDB, Amazon API Gateway, or custom events from your applications. Lambda listens to these event sources and automatically executes the code you've configured.

**Stateless Execution:**

Lambda functions are stateless, meaning they don't maintain any server-specific state between invocations. Each invocation of a Lambda function is independent and isolated from the others.

**Scaling and Concurrency:**

AWS Lambda automatically scales based on the number of incoming events. If there are more events, AWS will create more instances of your Lambda function to handle the load, and if there are fewer events, it will scale down accordingly. You pay only for the compute time your code consumes.

**Execution Environment:**

Each Lambda function runs in an execution environment provided by AWS. You can't control or manage this environment, but you can specify its configuration, including the amount of memory allocated to the function.

**Function Versioning and Aliases:**

You can create multiple versions of a Lambda function. This is useful for deploying and managing different versions of your code. You can also create aliases to point to specific versions, allowing you to easily switch between them.

**IAM Roles:**

Lambda functions can assume AWS Identity and Access Management (IAM) roles. These roles define what AWS services and resources the function can interact with, ensuring proper security and access control.

**Logging and Monitoring:**

AWS Lambda provides built-in logging to capture function execution details. You can also integrate it with AWS CloudWatch for monitoring and creating custom metrics.

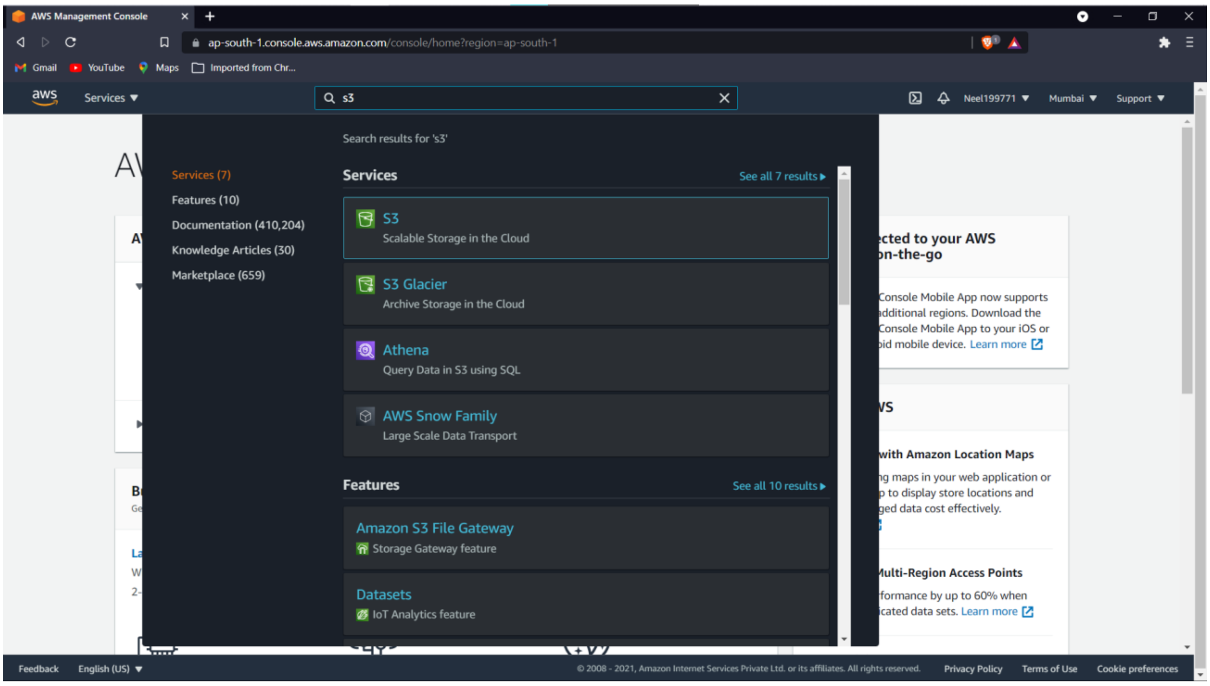
**Triggers and Destinations:**

Lambda can be triggered by various event sources and can send the results to destinations such as other AWS services, like S3, DynamoDB, SNS, and more.

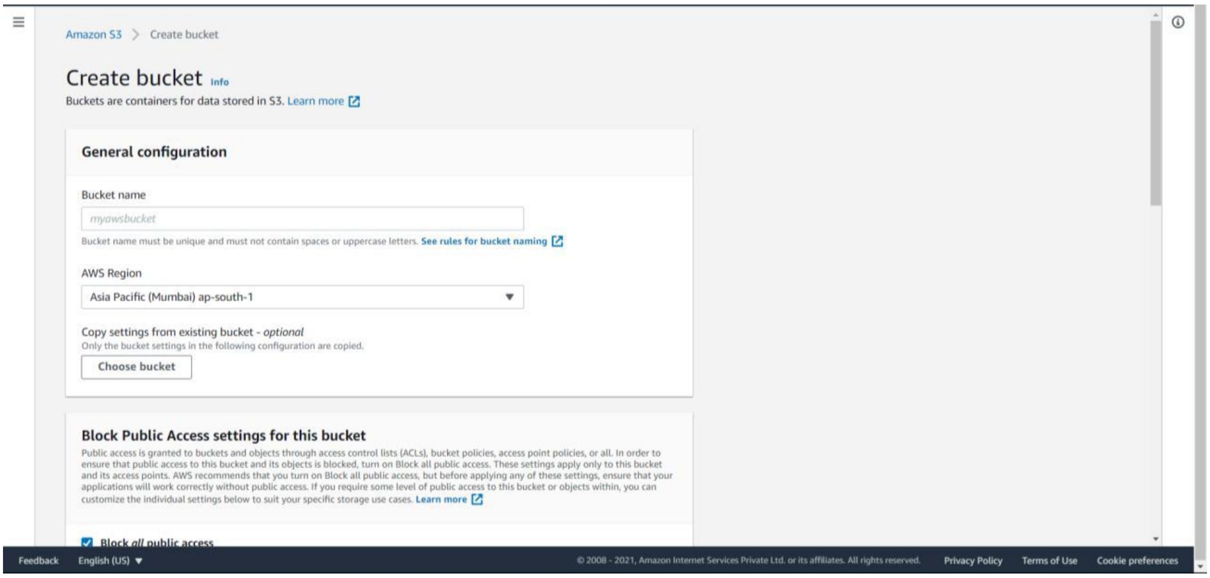
**STEPS:**

**Login to Aws account-**

**Search S3 ,click on the option below shown-**



**Create an S3 bucket by giving it a name**



Amazon S3 > Create bucket

Create bucket Info

Buckets are containers for data stored in S3. Learn more

General configuration

Bucket name

myawsbucket

Bucket name must be unique and must not contain spaces or uppercase letters. See rules for bucket naming

AWS Region

Asia Pacific (Mumbai) ap-south-1 ▼

Copy settings from existing bucket - *optional*

Only the bucket settings in the following configuration are copied.

Choose bucket

Block Public Access settings for this bucket

Public access is granted to buckets and objects through access control lists (ACLs), bucket policies, access point policies, or all. In order to ensure that public access to this bucket and its objects is blocked, turn on Block all public access. These settings apply only to this bucket and its access points. AWS recommends that you turn on Block all public access, but before applying any of these settings, ensure that your applications will work correctly without public access. If you require some level of public access to this bucket or objects within, you can customize the individual settings below to suit your specific storage use cases. Learn more

☑ Block *all* public access

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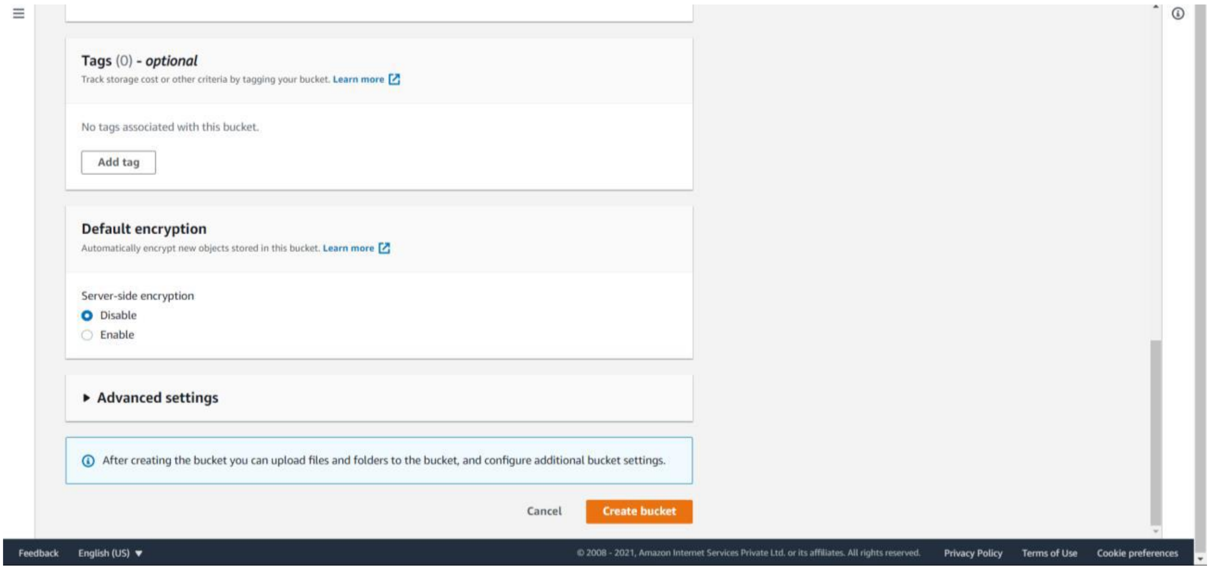

Tags (0) - *optional*

Track storage cost or other criteria by tagging your bucket. Learn more

No tags associated with this bucket.

Add tag

Default encryption

Automatically encrypt new objects stored in this bucket. Learn more

Server-side encryption

● Disable

○ Enable

▸ Advanced settings

After creating the bucket you can upload files and folders to the bucket, and configure additional bucket settings.

Cancel
Create bucket
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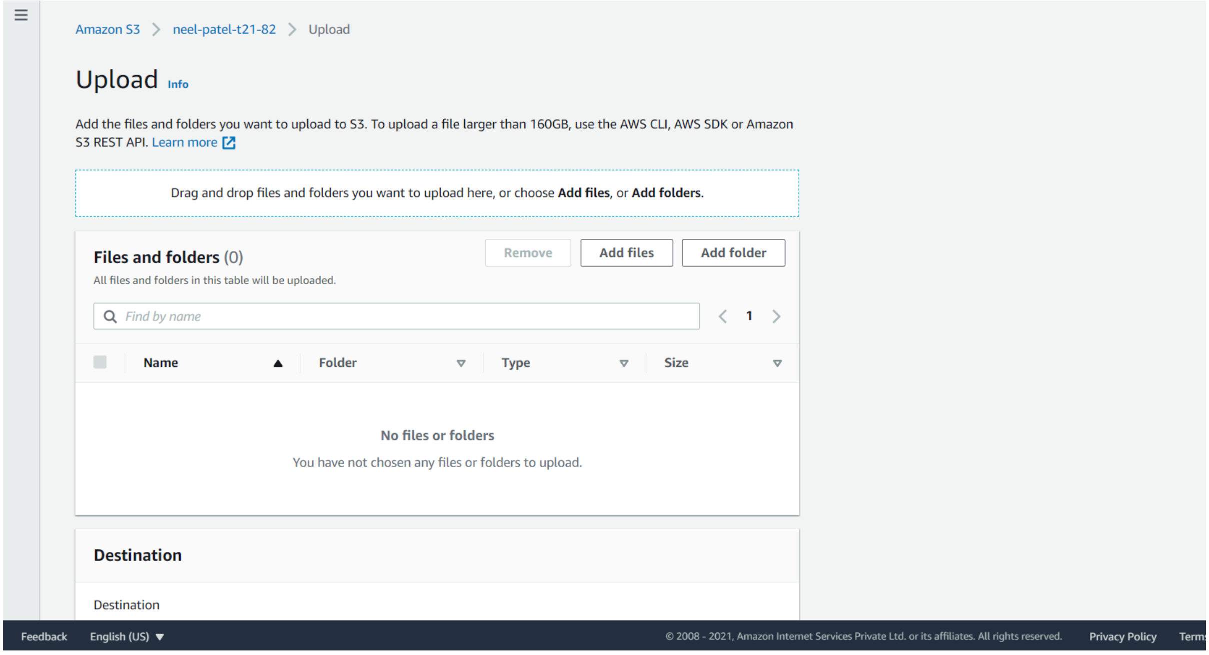
**Click on upload button after the s3 bucket is created in the object section**



Upload Info

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDK or Amazon S3 REST API. Learn more

Drag and drop files and folders you want to upload here, or choose **Add files**, or **Add folders**.

**Files and folders** (0)

All files and folders in this table will be uploaded.

| □ | Name | Folder | Type | Size |
|---|---|---|---|---|

**No files or folders**

You have not chosen any files or folders to upload.

**Destination**

Destination

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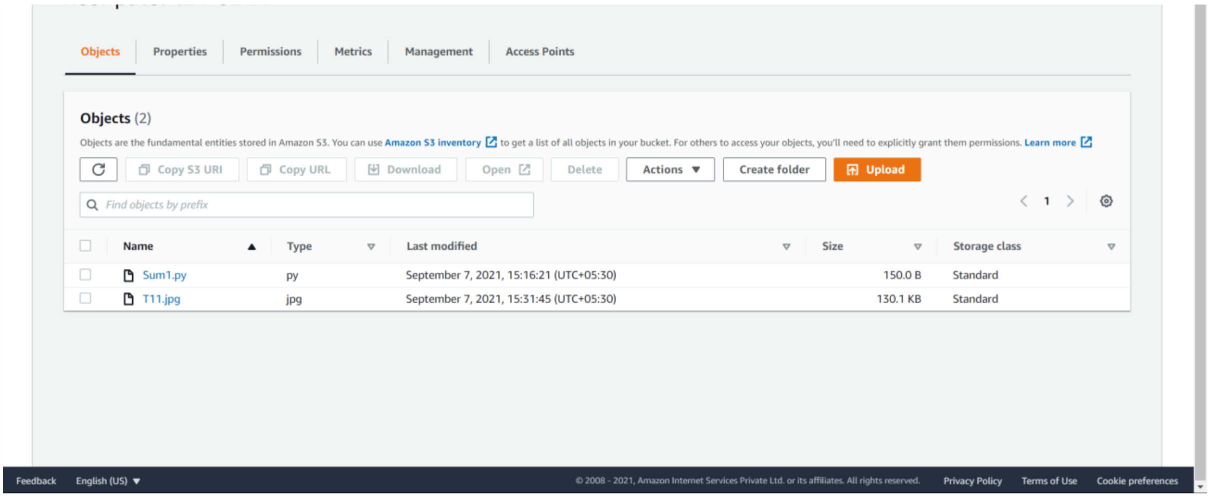
# Add any .py or .java extenstion file and click on upload Now search



**Objects** (2)

Objects are the fundamental entities stored in Amazon S3. You can use **Amazon S3 inventory** to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. **Learn more**

| □ | Name | Type | Last modified | Size | Storage class |
|---|---|---|---|---|---|
| □ | Sum1.py | py | September 7, 2021, 15:16:21 (UTC+05:30) | 150.0 B | Standard |
| □ | T11.jpg | jpg | September 7, 2021, 15:31:45 (UTC+05:30) | 130.1 KB | Standard |

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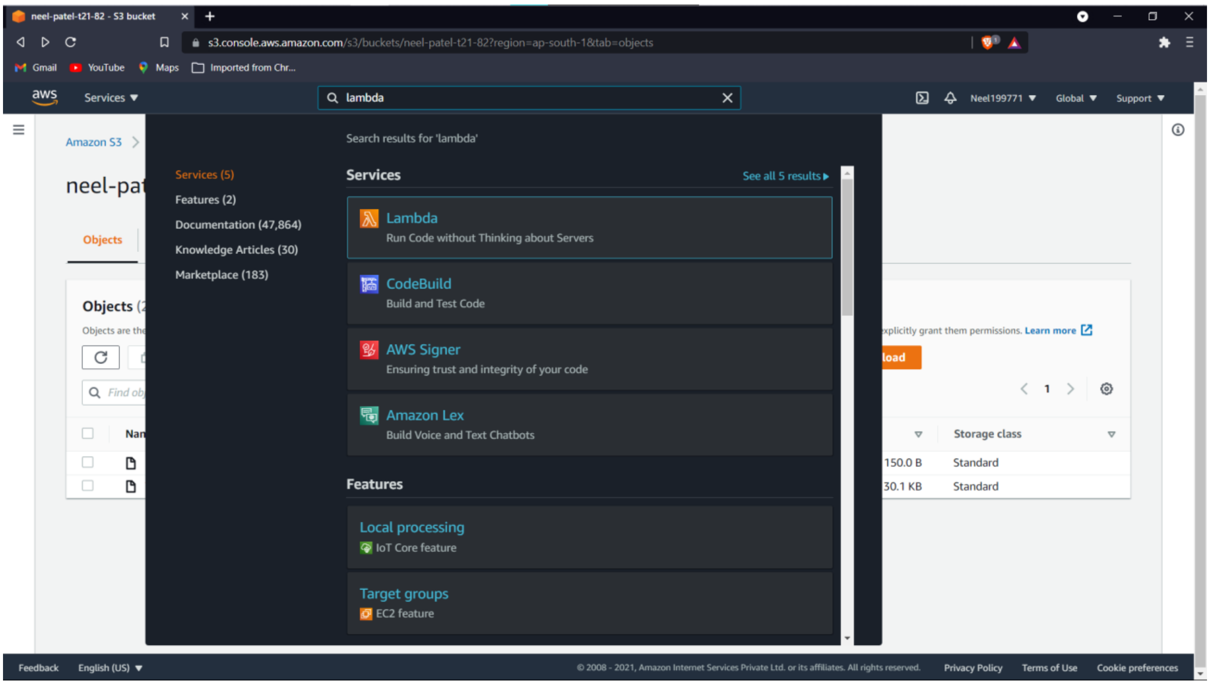
# Now search Lamda



neel-patel-t21-82 - S3 bucket

s3.console.aws.amazon.com/s3/buckets/neel-patel-t21-82?region=ap-south-1&tab=objects

Gmail YouTube Maps Imported from Chr...

aws Services ▼ lambda Neel199771 ▼ Global ▼ Support ▼

Amazon S3 > neel-pat Objects

Objects ( Objects are th Find obj Nam

Search results for 'lambda'

Services (5)
Features (2)
Documentation (47,864)
Knowledge Articles (30)
Marketplace (183)

Services See all 5 results ▸

Lambda
Run Code without Thinking about Servers

CodeBuild
Build and Test Code

AWS Signer
Ensuring trust and integrity of your code

Amazon Lex
Build Voice and Text Chatbots

Features

Local processing
IoT Core feature

Target groups
EC2 feature

xplicitly grant them permissions. Learn more

load

Storage class

| | |
|---|---|
| 150.0 B | Standard |
| 30.1 KB | Standard |

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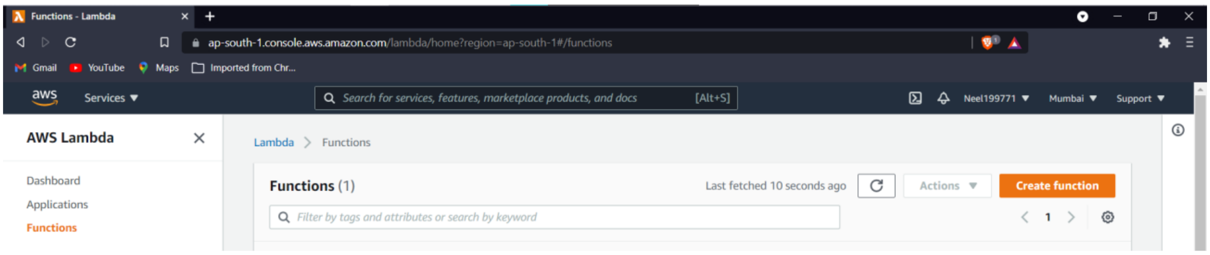
## Click create function



Functions - Lambda

ap-south-1.console.aws.amazon.com/lambda/home?region=ap-south-1#/functions

Gmail YouTube Maps Imported from Chr...

aws Services ▼ Search for services, features, marketplace products, and docs [Alt+S] Neel199771 ▼ Mumbai ▼ Support ▼

AWS Lambda

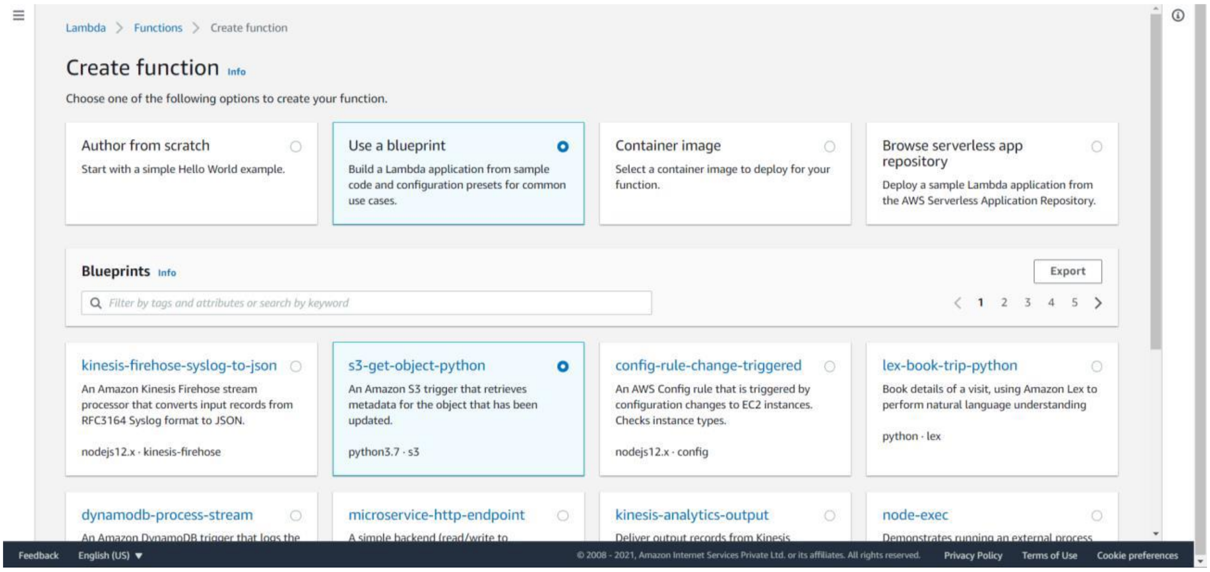
Dashboard
Applications
Functions

Lambda > Functions

Functions (1) Last fetched 10 seconds ago Actions ▼ Create function

Filter by tags and attributes or search by keyword

## Click on below options and click on configure



Lambda > Functions > Create function

Create function Info

Choose one of the following options to create your function.

○ Author from scratch
Start with a simple Hello World example.

● Use a blueprint
Build a Lambda application from sample code and configuration presets for common use cases.

○ Container image
Select a container image to deploy for your function.

○ Browse serverless app repository
Deploy a sample Lambda application from the AWS Serverless Application Repository.

Blueprints Info Export

Filter by tags and attributes or search by keyword

< 1 2 3 4 5 >

○ kinesis-firehose-syslog-to-json
An Amazon Kinesis Firehose stream processor that converts input records from RFC3164 Syslog format to JSON.
nodejs12.x · kinesis-firehose

● s3-get-object-python
An Amazon S3 trigger that retrieves metadata for the object that has been updated.
python3.7 · s3

○ config-rule-change-triggered
An AWS Config rule that is triggered by configuration changes to EC2 instances. Checks instance types.
nodejs12.x · config

○ lex-book-trip-python
Book details of a visit, using Amazon Lex to perform natural language understanding
python · lex

○ dynamodb-process-stream
An Amazon DynamoDB trigger that logs the

○ microservice-http-endpoint
A simple backend (read/write to

○ kinesis-analytics-output
Deliver output records from Kinesis

○ node-exec
Demonstrates running an external process

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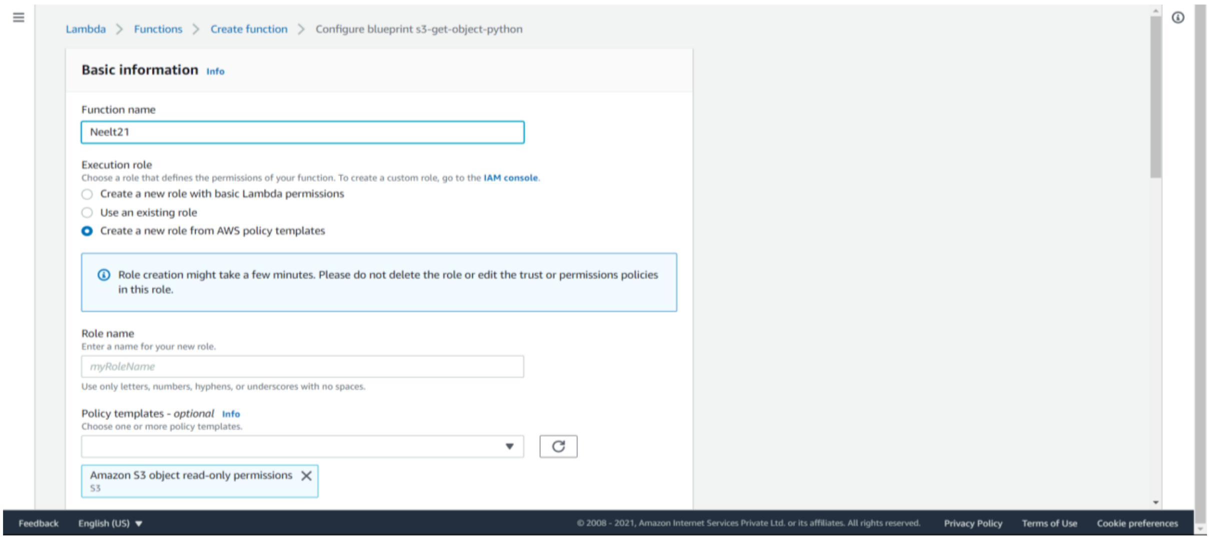

Lambda > Functions > Create function > Configure blueprint s3-get-object-python

**Basic information** Info

Function name

Neelt21

Execution role

Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console.

○ Create a new role with basic Lambda permissions

○ Use an existing role

● Create a new role from AWS policy templates

Role creation might take a few minutes. Please do not delete the role or edit the trust or permissions policies in this role.

Role name

Enter a name for your new role.

myRoleName

Use only letters, numbers, hyphens, or underscores with no spaces.

Policy templates - *optional* Info

Choose one or more policy templates.

Amazon S3 object read-only permissions
S3

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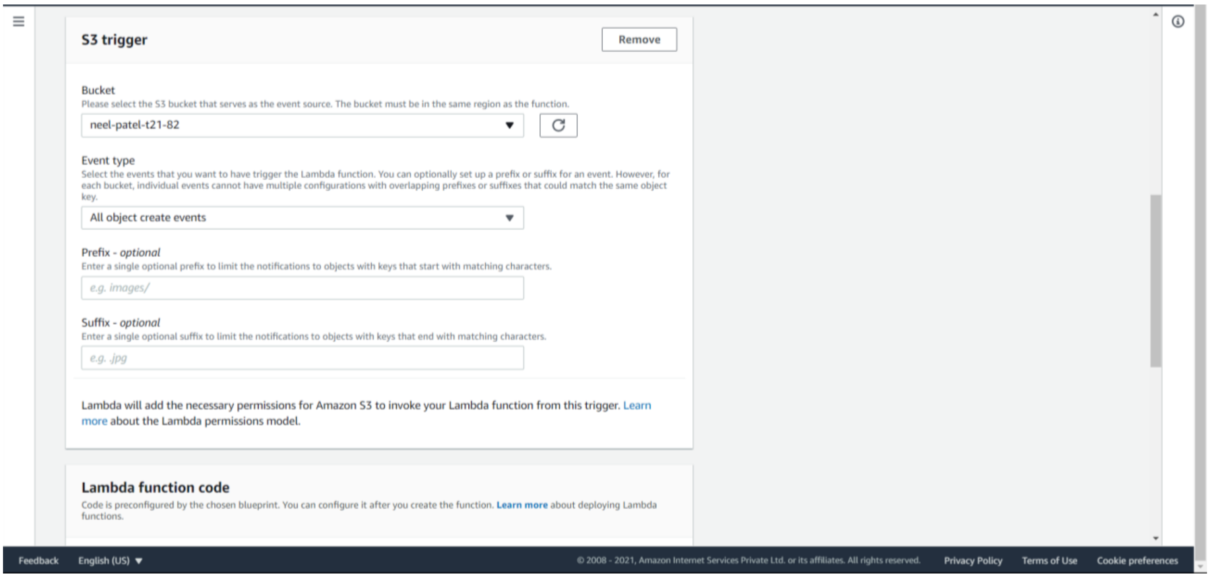
**Select the bucket created and create trigger ,click on create function-**
**Check the given trigger is created**
**Click on**



**S3 trigger** Remove

Bucket

Please select the S3 bucket that serves as the event source. The bucket must be in the same region as the function.

neel-patel-t21-82

Event type

Select the events that you want to have trigger the Lambda function. You can optionally set up a prefix or suffix for an event. However, for each bucket, individual events cannot have multiple configurations with overlapping prefixes or suffixes that could match the same object key.

All object create events

Prefix - *optional*

Enter a single optional prefix to limit the notifications to objects with keys that start with matching characters.

e.g. images/

Suffix - *optional*

Enter a single optional suffix to limit the notifications to objects with keys that end with matching characters.

e.g. .jpg

Lambda will add the necessary permissions for Amazon S3 to invoke your Lambda function from this trigger. Learn more about the Lambda permissions model.

**Lambda function code**

Code is preconfigured by the chosen blueprint. You can configure it after you create the function. Learn more about deploying Lambda functions.

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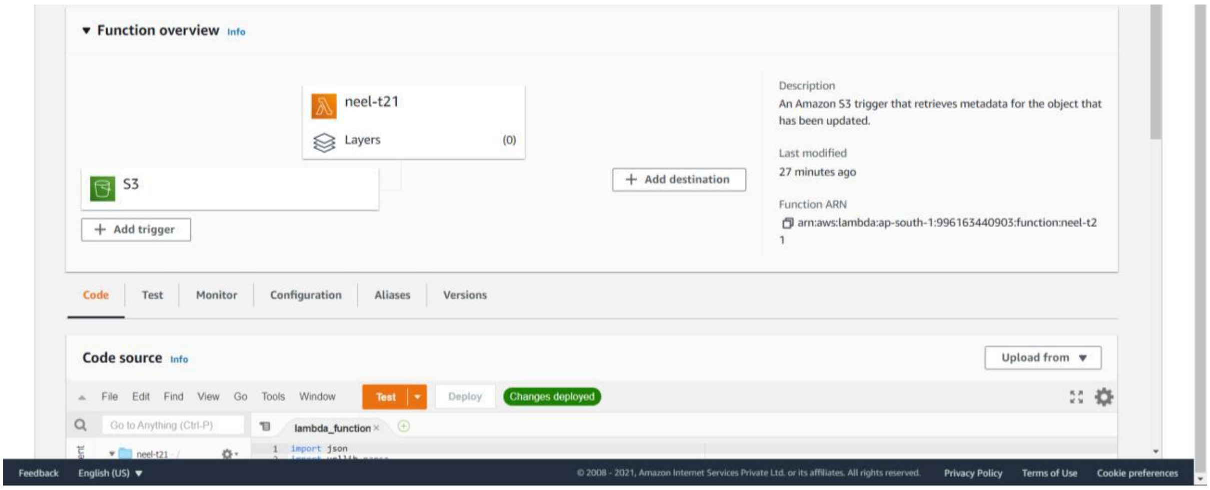
**Check the given trigger is created**
**Click on**

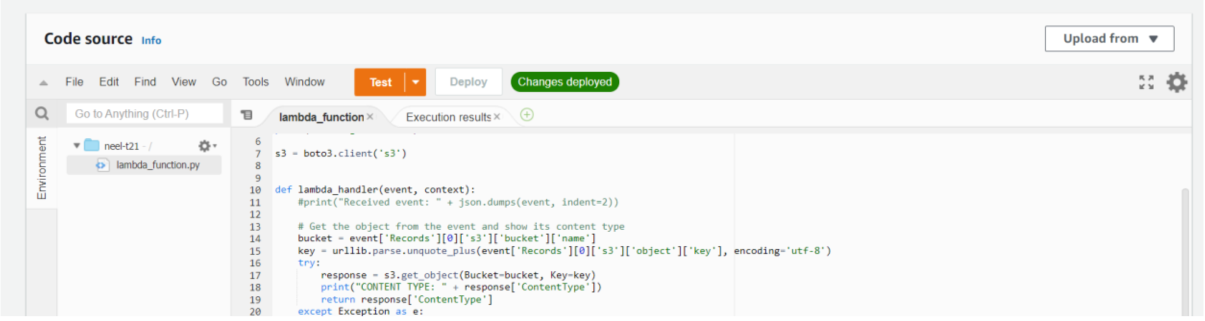


Description
An Amazon S3 trigger that retrieves metadata for the object that has been updated.

Last modified
27 minutes ago

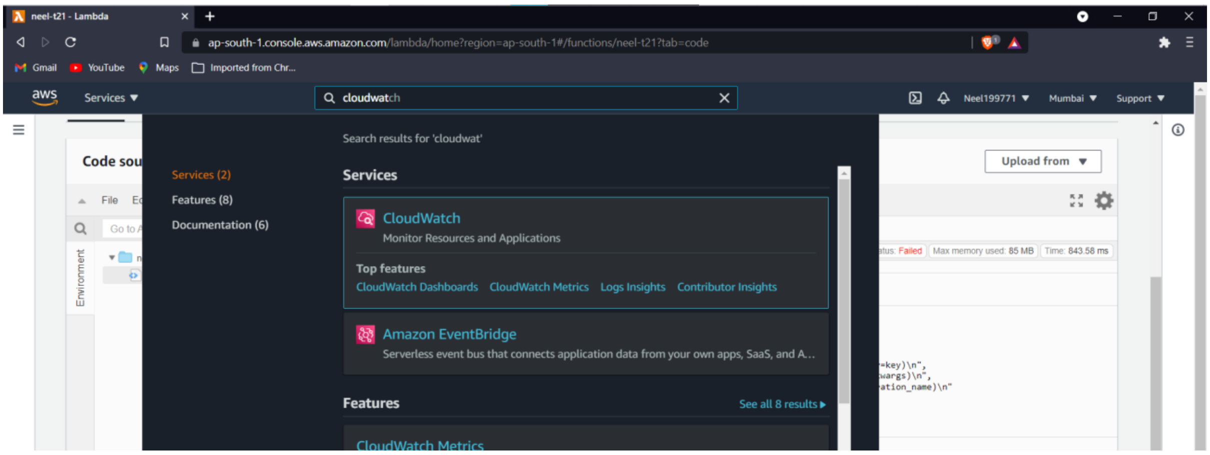
Function ARN
arn:aws:lambda:ap-south-1:996163440903:function:neel-t21

## Click on the orange test button-

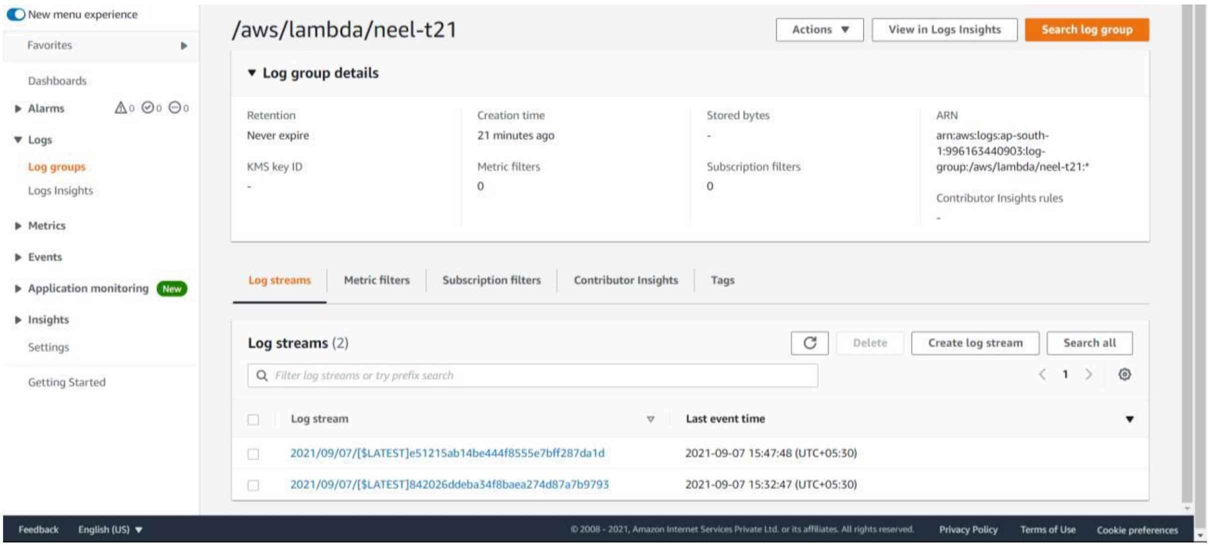


```
s3 = boto3.client('s3')


def lambda_handler(event, context):
    #print("Received event: " + json.dumps(event, indent=2))

    # Get the object from the event and show its content type
    bucket = event['Records'][0]['s3']['bucket']['name']
    key = urllib.parse.unquote_plus(event['Records'][0]['s3']['object']['key'], encoding='utf-8')
    try:
        response = s3.get_object(Bucket=bucket, Key=key)
        print("CONTENT TYPE: " + response['ContentType'])
        return response['ContentType']
    except Exception as e:
```

## Now,



## Check the logs of the test-



/aws/lambda/neel-t21

Log group details

| | | | |
|---|---|---|---|
| Retention<br>Never expire | Creation time<br>21 minutes ago | Stored bytes<br>- | ARN<br>arn:aws:logs:ap-south-1:996163440903:log-group:/aws/lambda/neel-t21:* |
| KMS key ID<br>- | Metric filters<br>0 | Subscription filters<br>0 | Contributor Insights rules<br>- |

Log streams (2)

| Log stream | Last event time |
|---|---|
| 2021/09/07/[$LATEST]e51215ab14be444f8555e7bff287da1d | 2021-09-07 15:47:48 (UTC+05:30) |
| 2021/09/07/[$LATEST]842026ddeba34f8baea274d87a7b9793 | 2021-09-07 15:32:47 (UTC+05:30) |

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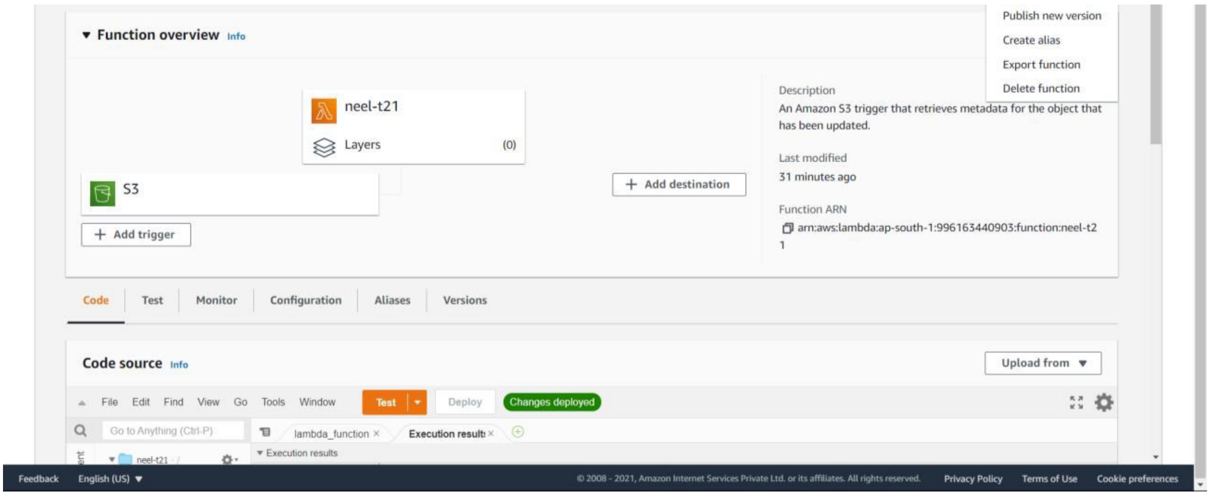
## Now terminate-
## Click on delete function.



Description
An Amazon S3 trigger that retrieves metadata for the object that has been updated.

Last modified
31 minutes ago

Function ARN
arn:aws:lambda:ap-south-1:996163440903:function:neel-t21

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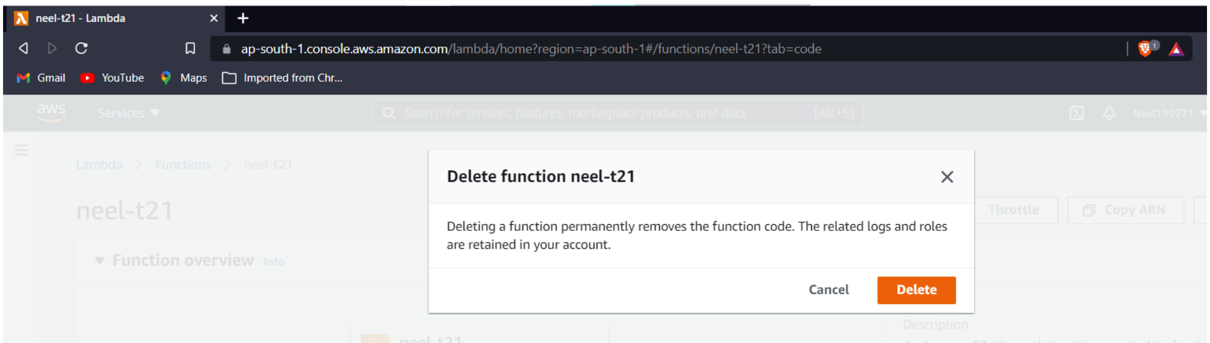
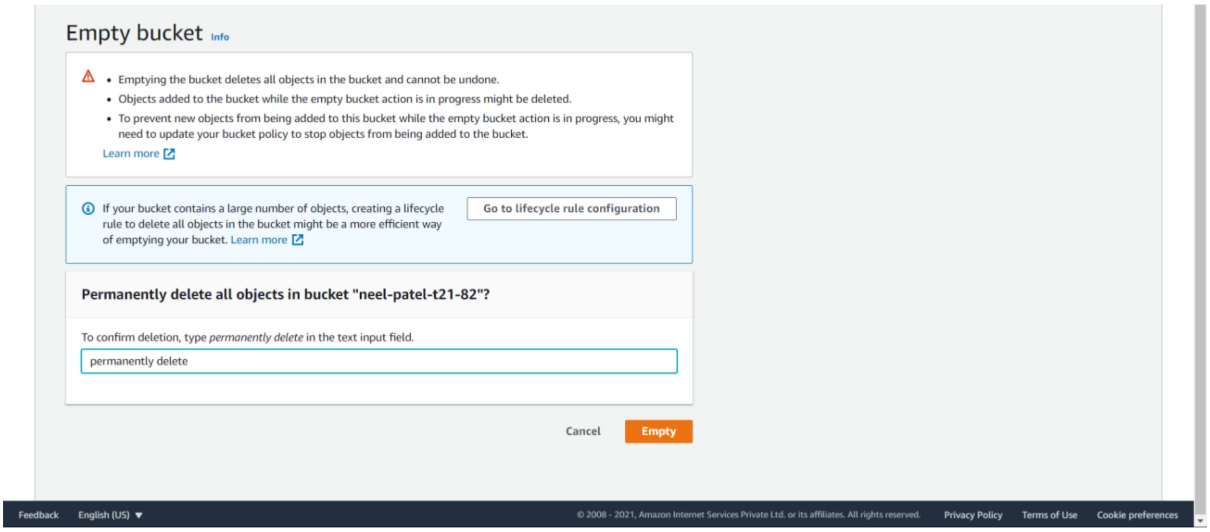

neel-t21 - Lambda
ap-south-1.console.aws.amazon.com/lambda/home?region=ap-south-1#/functions/neel-t21?tab=code
Gmail
YouTube
Maps
Imported from Chr...
Lambda > Functions > neel-t21
neel-t21
Function overview Info
Throttle
Copy ARN
Cancel
Delete

Delete function neel-t21

Deleting a function permanently removes the function code. The related logs and roles are retained in your account.

## Empty bucket



Empty bucket Info

- Emptying the bucket deletes all objects in the bucket and cannot be undone.
- Objects added to the bucket while the empty bucket action is in progress might be deleted.
- To prevent new objects from being added to this bucket while the empty bucket action is in progress, you might need to update your bucket policy to stop objects from being added to the bucket.

Learn more

If your bucket contains a large number of objects, creating a lifecycle rule to delete all objects in the bucket might be a more efficient way of emptying your bucket. Learn more

Permanently delete all objects in bucket "neel-patel-t21-82"?

To confirm deletion, type *permanently delete* in the text input field.

permanently delete

Go to lifecycle rule configuration
Cancel
Empty
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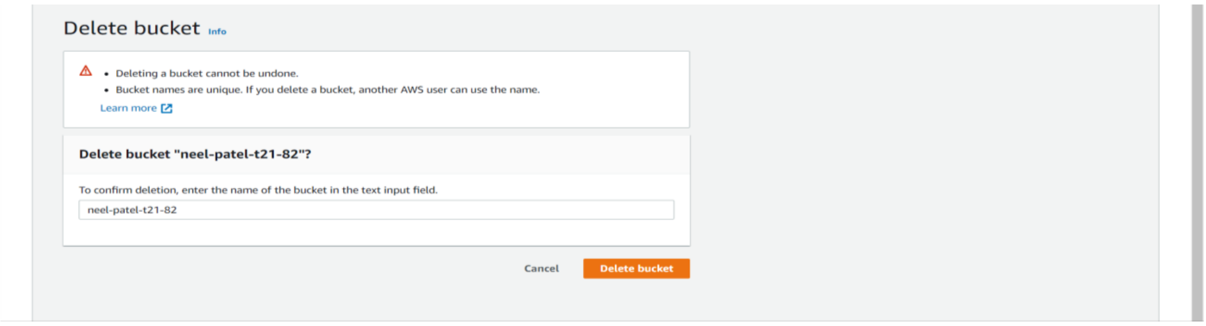
## Delete bucket-



Delete bucket Info

- Deleting a bucket cannot be undone.
- Bucket names are unique. If you delete a bucket, another AWS user can use the name.

Learn more

Delete bucket "neel-patel-t21-82"?

To confirm deletion, enter the name of the bucket in the text input field.

neel-patel-t21-82

## CONCLUSION:

In this assignment, we covered the core concepts and terminologies of AWS Lambda, explored its practical applications, and gained an understanding of how it integrates with various AWS services.