St. Francis Institute of Technology, Mumbai-400 103
Department Of Information Technology

A.Y. 2021-2022
Class: TE-ITA/B, Semester: V

Subject: **Advanced DevOps Lab**

Experiment – 12: To create AWS Lambda function to log "an object has been added" on adding an object to s3 bucket.

1. Aim: To write the Lambda function to take specific action when invoked.
2. Objectives: Aim of this experiment is that, the students will learn:
- Serverless cloud concept
- To create Lambda function for specific application
- Configuring Lambda bucket as a Lambda event source.
- Trigger a Lambda function.
- Monitoring AWS Lambda

3. Outcomes: After study of this experiment, the students will learn following:
- Introduction to Serverless computing
- Creating Lambda function
- Testing Lambda function
- Monitoring and Logging Lambda function

4. Prerequisite: Knowledge of AWS S3, lambda functions and AWS console. **5. Requirements:** AWS account, browser, Personal Computer, Windows operating system, Internet Connection, Google Doc.
6. Pre-Experiment Exercise:
Brief Theory: Refer shared material
7. Laboratory Exercise
A. Procedure:
a. Answer the following:
- Explain AWS Lambda execution role?

A Lambda function's execution role is an AWS Identity and Access Management (IAM) role that grants the function permission to access AWS services and resources. You provide this role when you create a function, and Lambda assumes the role when your function is invoked. You can create an execution role for development that has permission to send logs to Amazon CloudWatch and to upload trace data to AWS X-Ray.

To view a function's execution role

1. Open the Functions page on the Lambda console.
2. Choose a function.
3. Choose Configuration and then choose Permissions.
4. Under Resource summary, view the services and resources that the function can access.

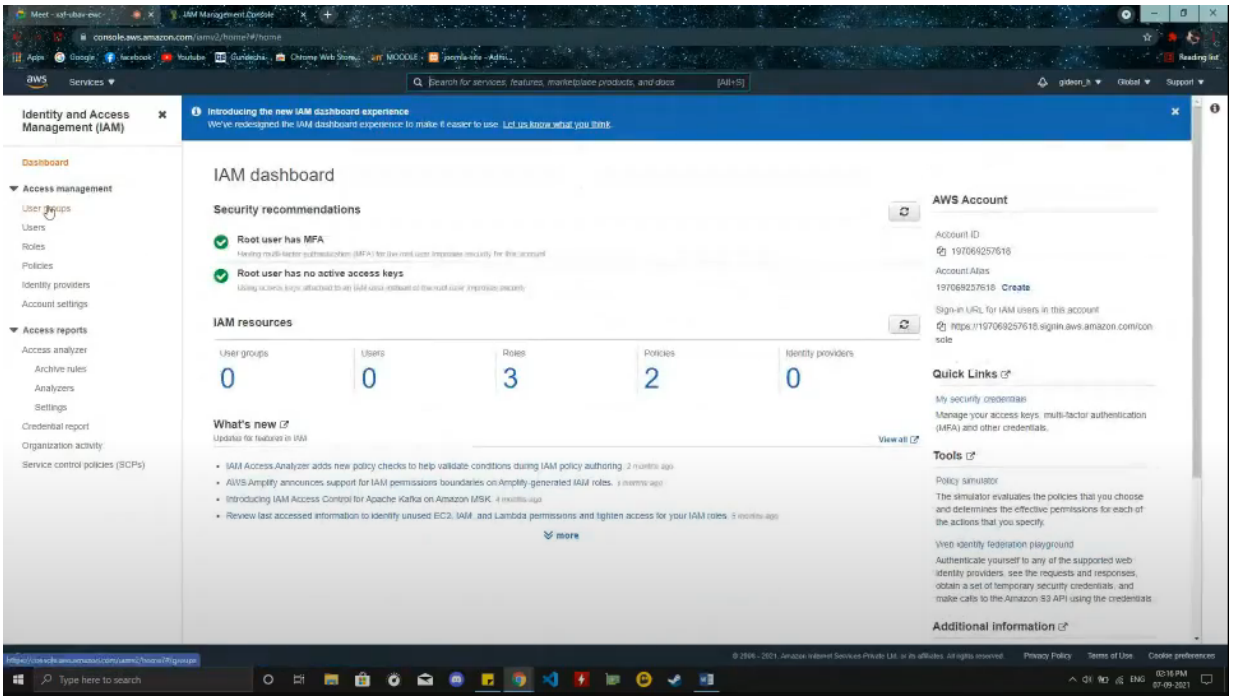
5. Choose a service from the dropdown list to see permissions related to that service.

You can add or remove permissions from a function's execution role at any time, or configure your function to use a different role. Add permissions for any services that your function calls with the AWS SDK, and for services that Lambda uses to enable optional features.
When you add permissions to your function, make an update to its code or configuration as well. This forces running instances of your function, which have out-of-date credentials, to stop and be replaced.

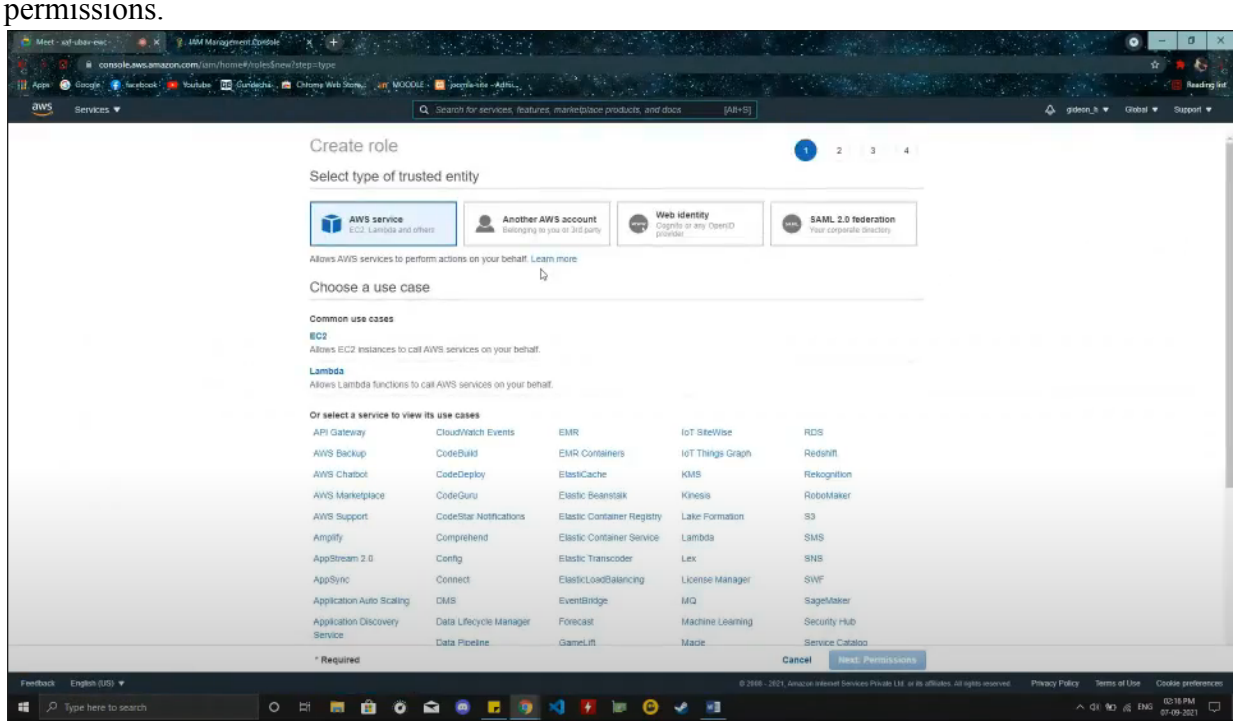
● What is serverless computing?
Serverless is a way to describe the services, practices, and strategies that enable you to build more agile applications so you can innovate and respond to change faster. With serverless computing, infrastructure management tasks like capacity provisioning and patching are handled by AWS, so you can focus on only writing code that serves your customers. Serverless services like AWS Lambda come with automatic scaling, built-in high availability, and a pay-for-value billing model. Lambda is an event-driven compute service that enables you to run code in response to events from over 200 natively-integrated AWS and SaaS sources - all without managing any servers.
Move from idea to market, faster
Lower your costs
Adapt at scale
Build better applications, easier
Serverless applications have built-in service integrations, so you can focus on building your application instead of configuring it.

b. Execute following and attach screenshots:

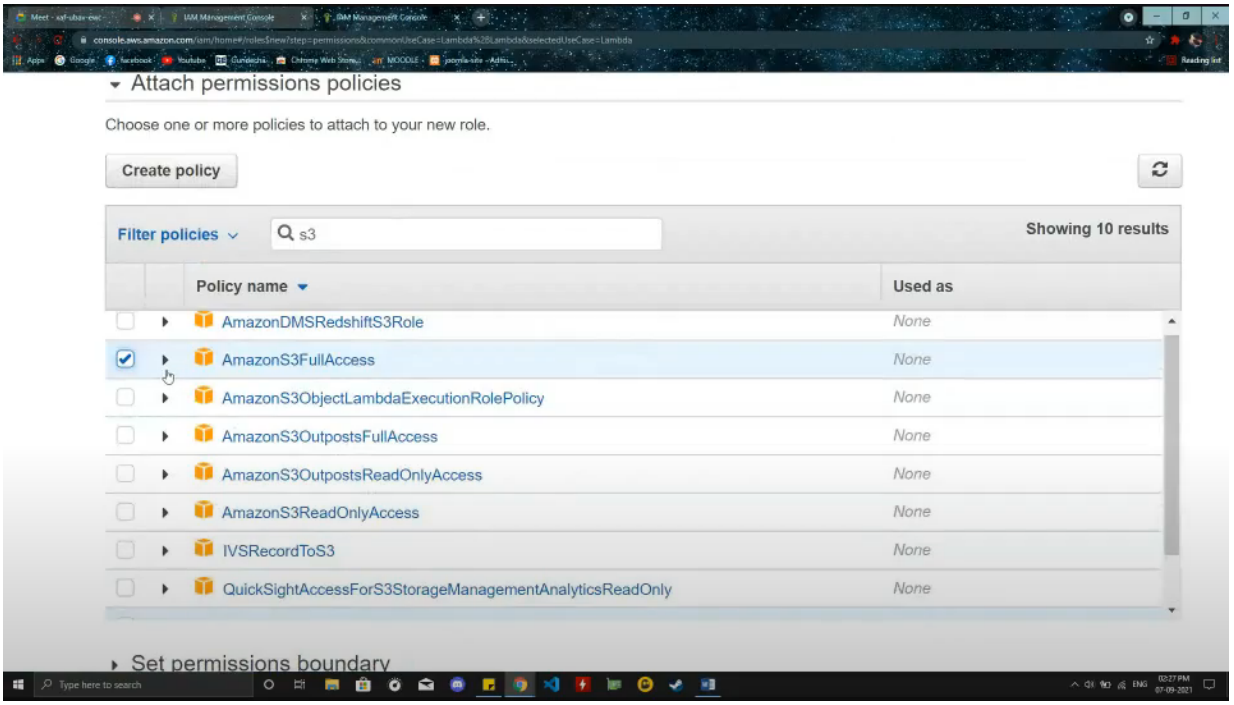
Step 1: Create an iam role with 3 policies: s3fullaccess,coludwatchfullaccess and AwsLambdaBasicExecutionRole

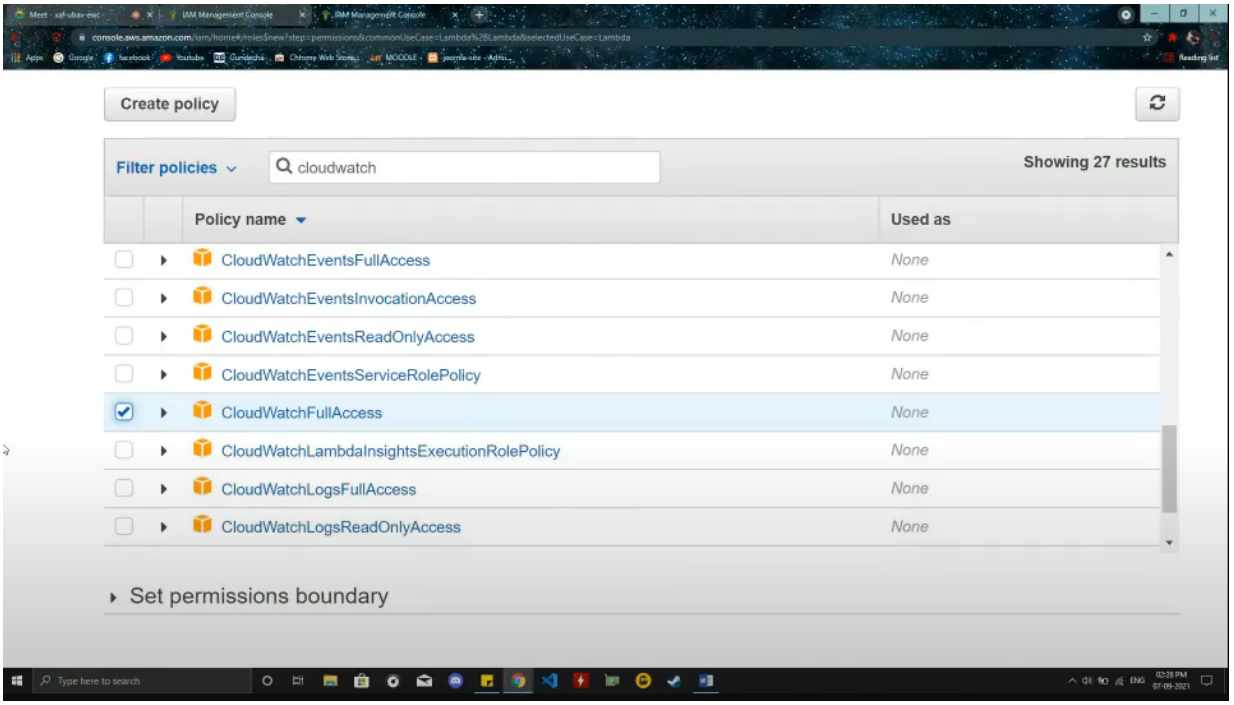


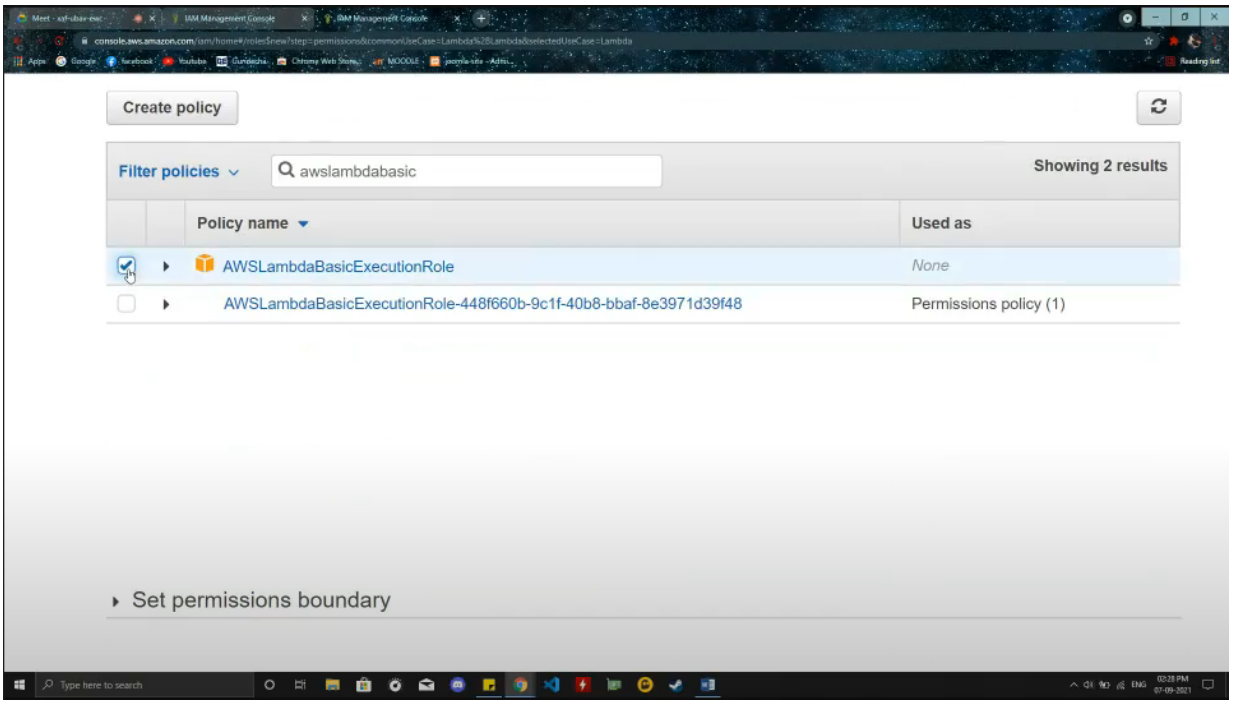
Click on roles.Click on Create Role and choose a use case as Lambda and click on next permissions.



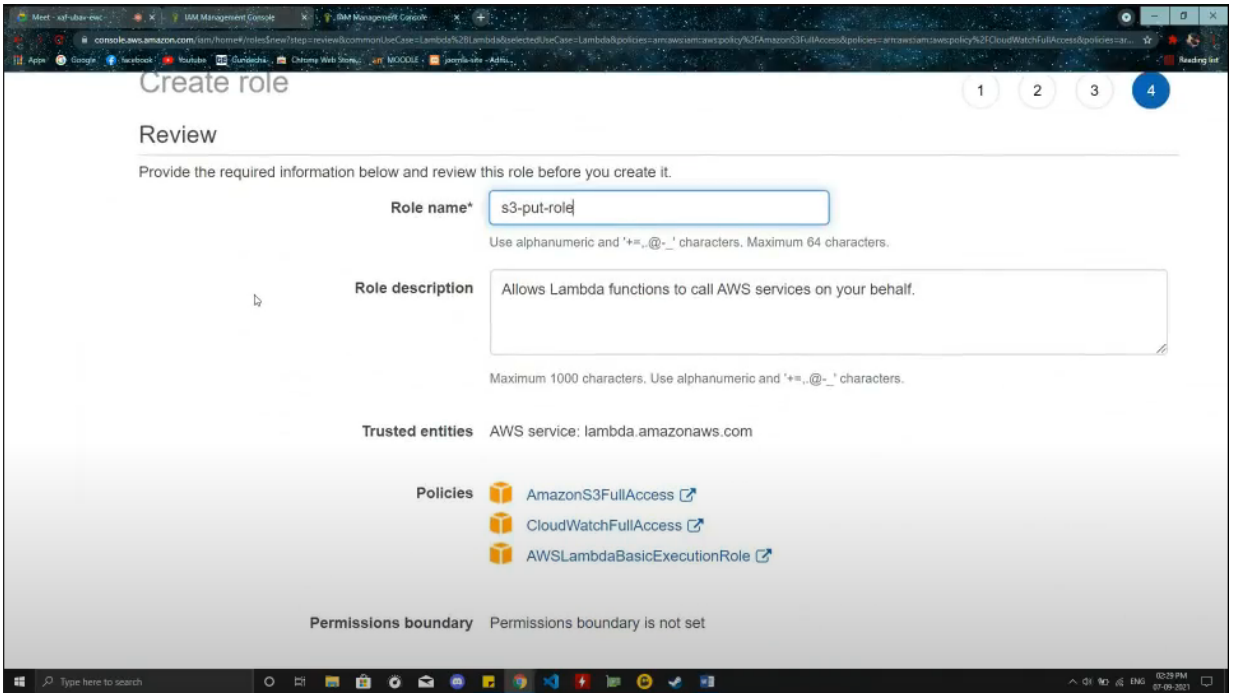
Select policies : AWSLambdaBasicExecutionRole and CloudWatchFull Aceess and AmazonS3Full access.



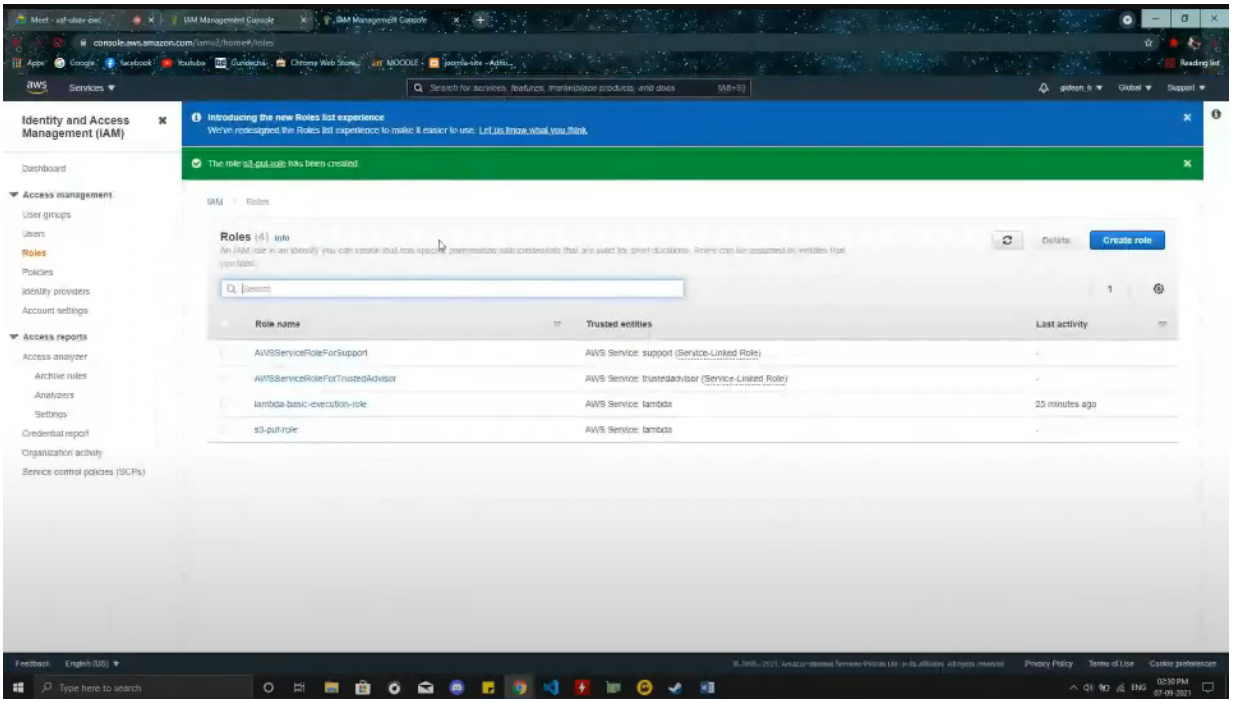




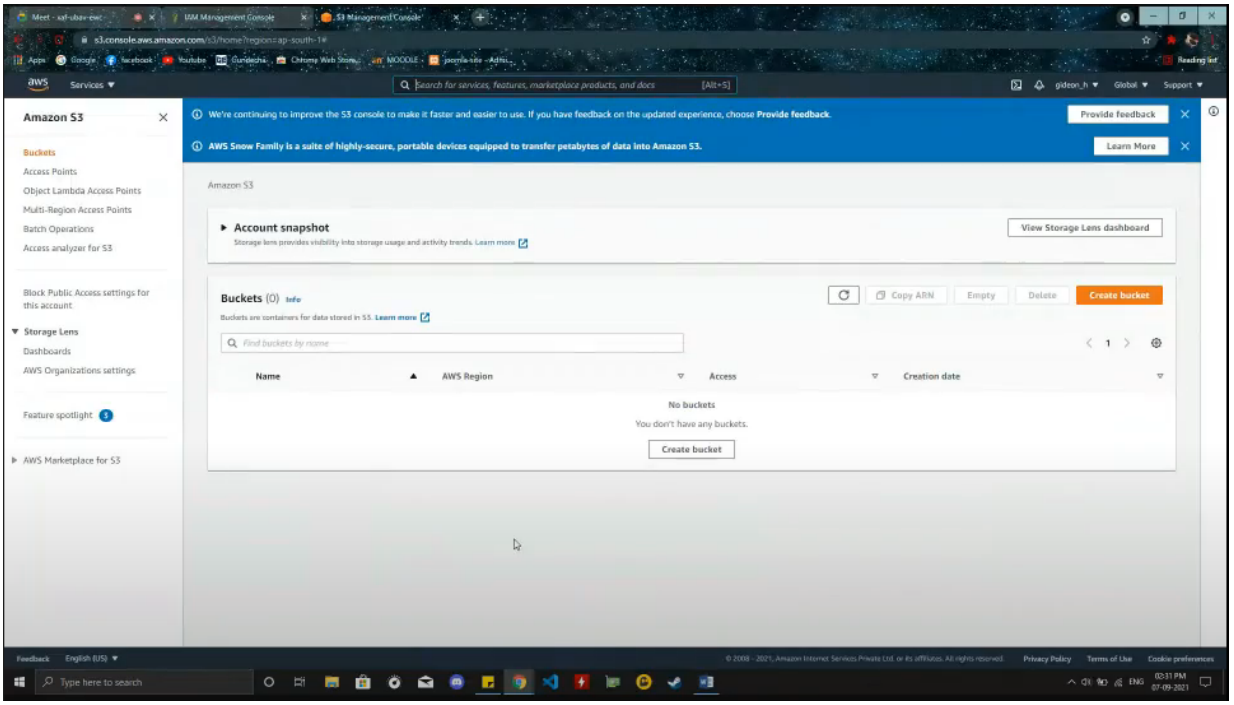
Give Role Name: s3-put-role

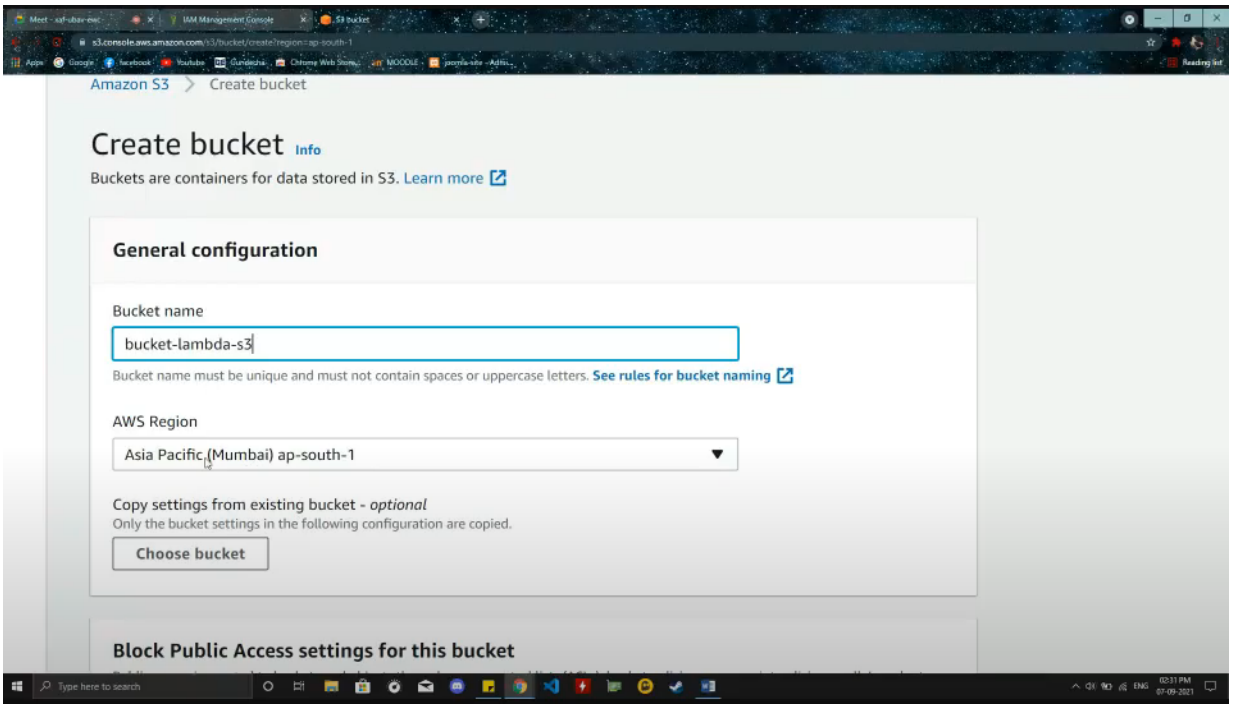


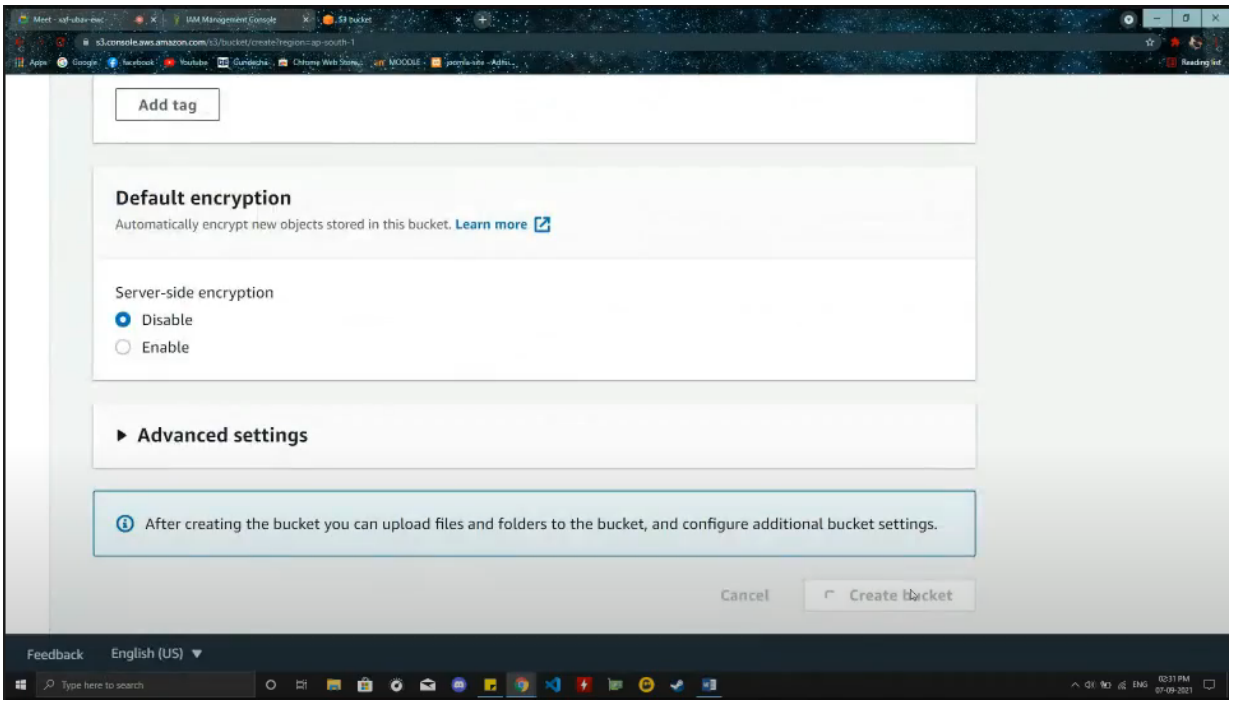
Role s3_put_object_role has been created successfully. Step 1 done.



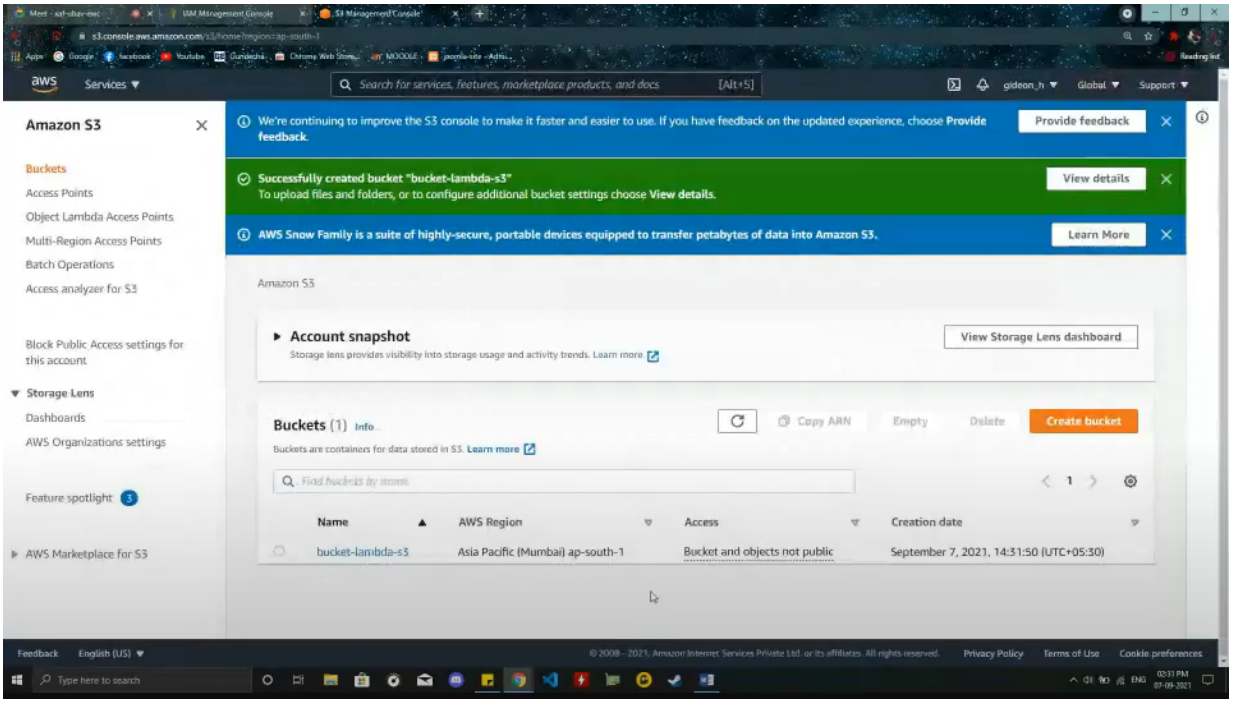
Step 2: Create an empty bucket using s3.
Go to services , s3, give globally unique bucket name, bucket versioning enable, create bucket.

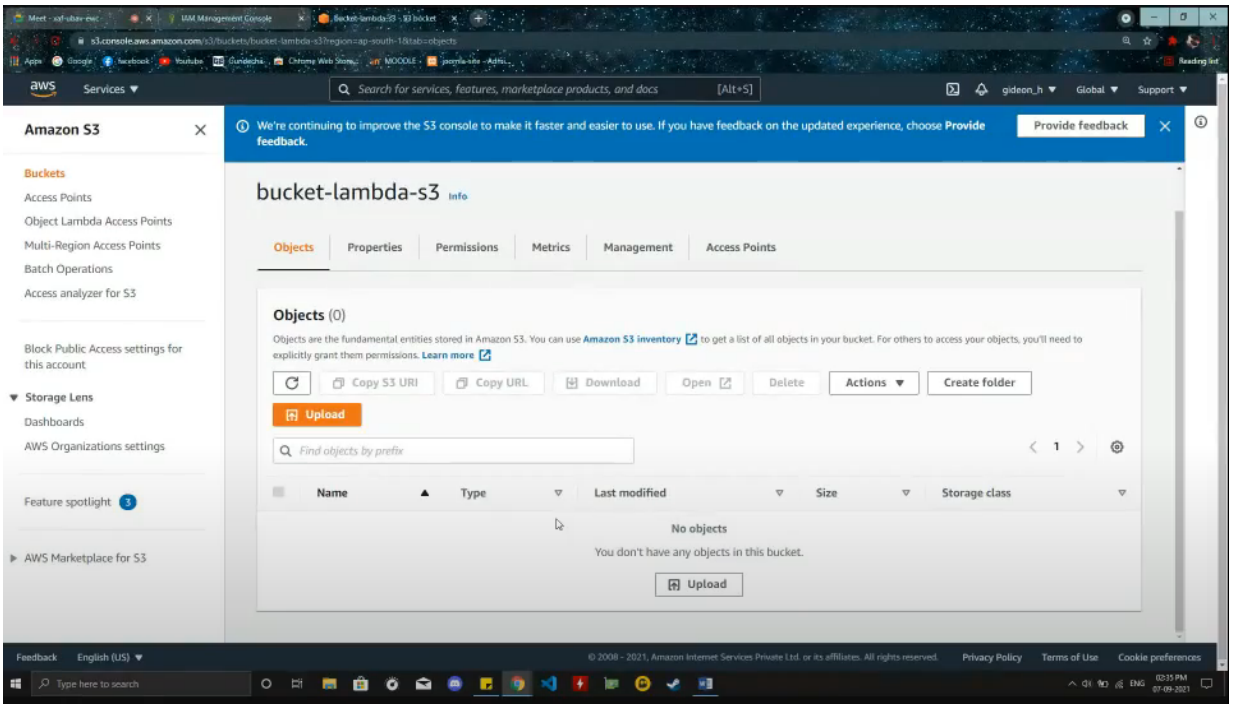



Amazon S3 > Create bucket
Create bucket Info
Buckets are containers for data stored in S3. Learn more
General configuration
Bucket name
bucket-lambda-s3
Bucket name must be unique and must not contain spaces or uppercase letters. See rules for bucket naming
AWS Region
Asia Pacific (Mumbai) ap-south-1
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

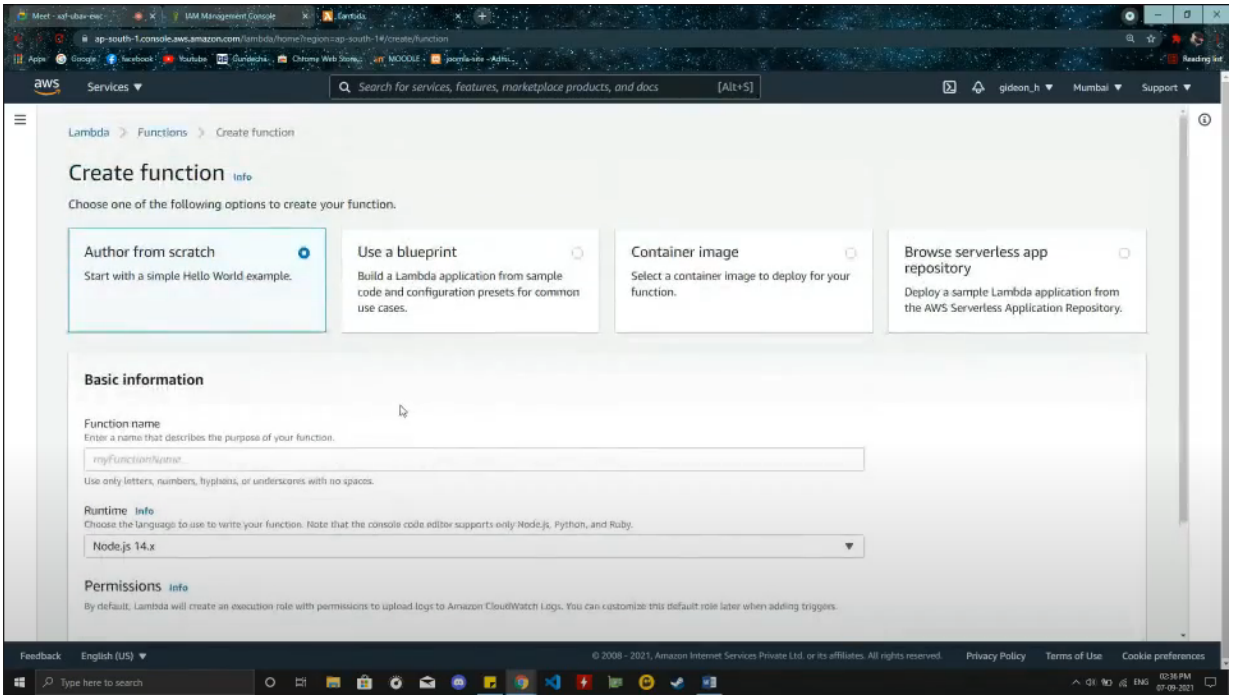

Add tag
Default encryption
Automatically encrypt new objects stored in this bucket. Learn more
Server-side encryption
Disable
Enable
Advanced settings
After creating the bucket you can upload files and folders to the bucket, and configure additional bucket settings.
Cancel
Create bucket
Feedback
English (US)

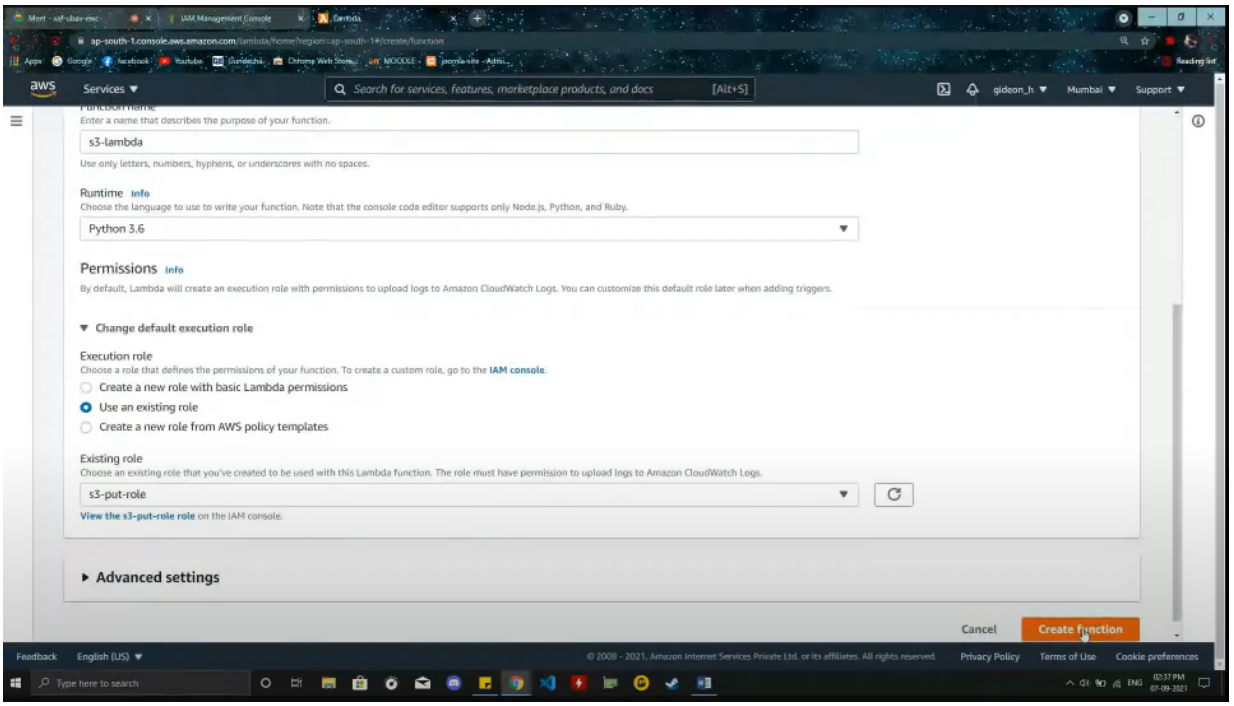
Step 2 done i.e. empty Bucket created successfully.



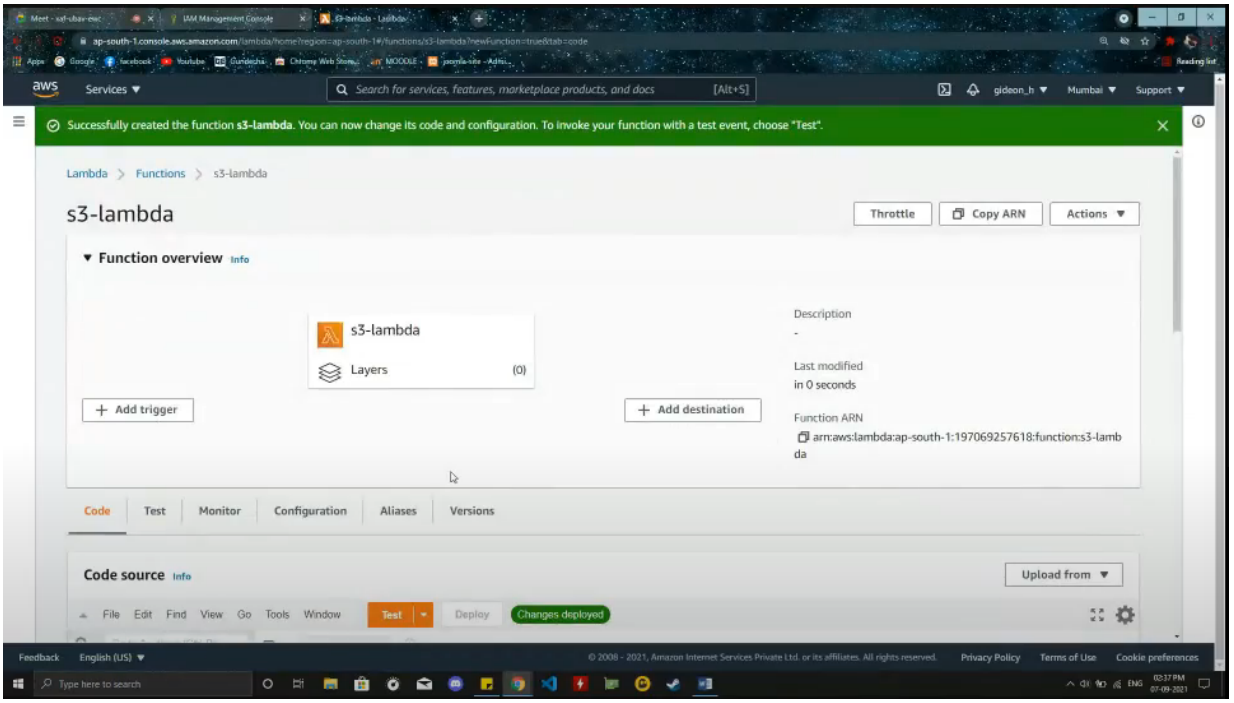


Step 3: Create a Lambda Function

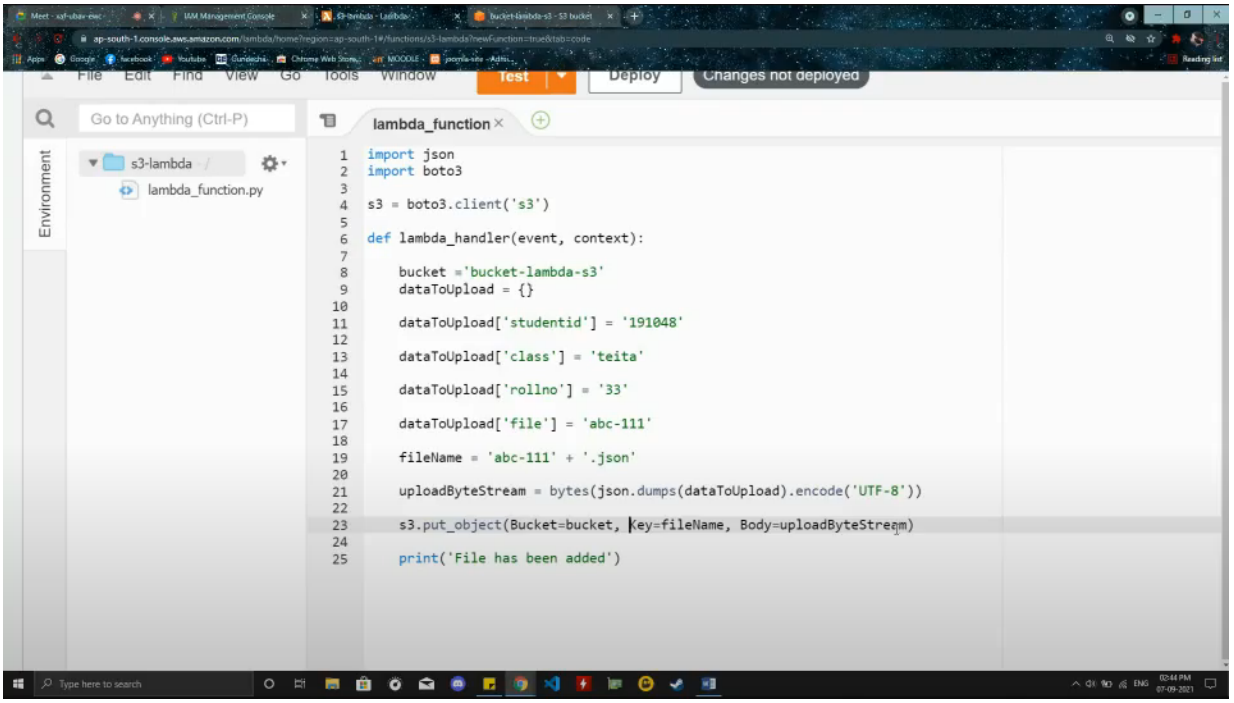




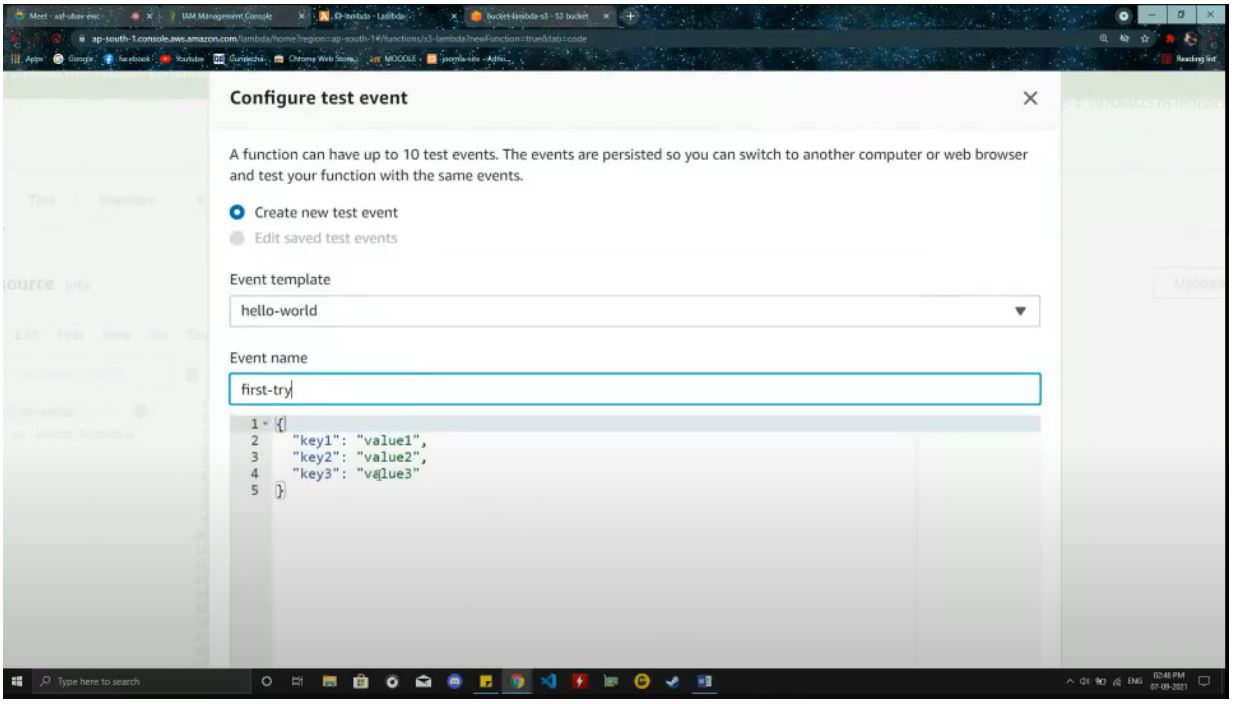
Successfully created a function



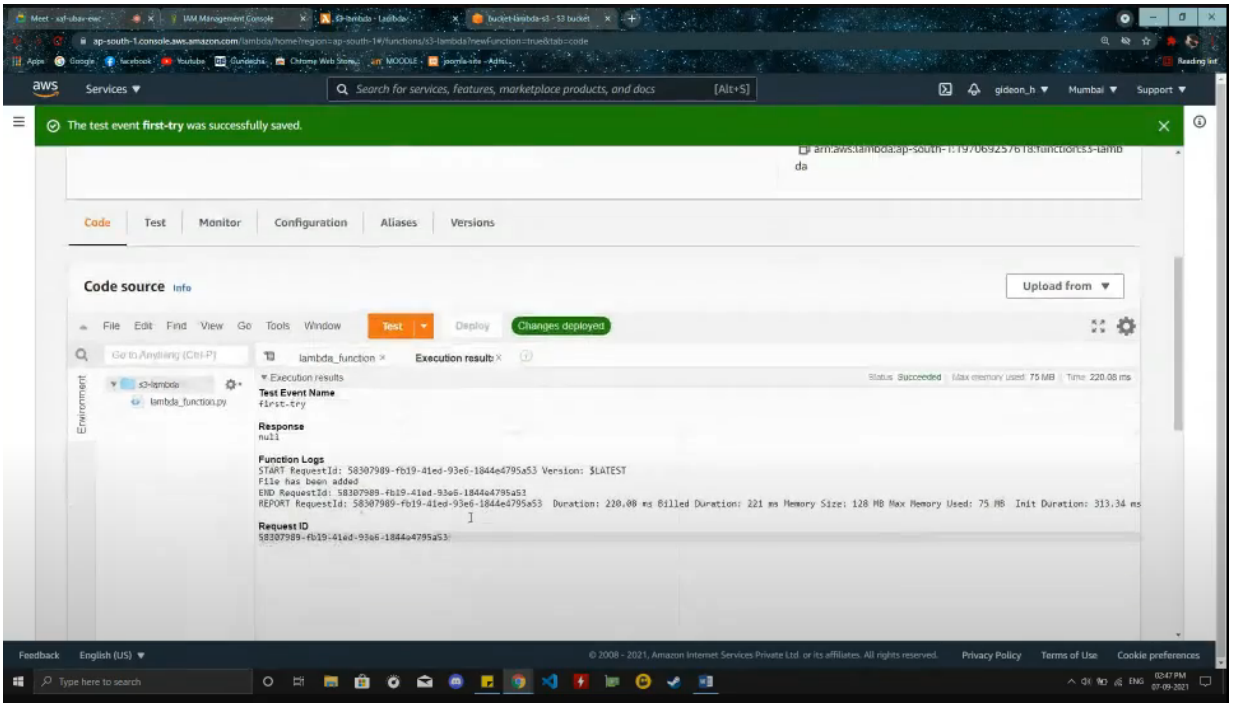
Write following script as lambda function



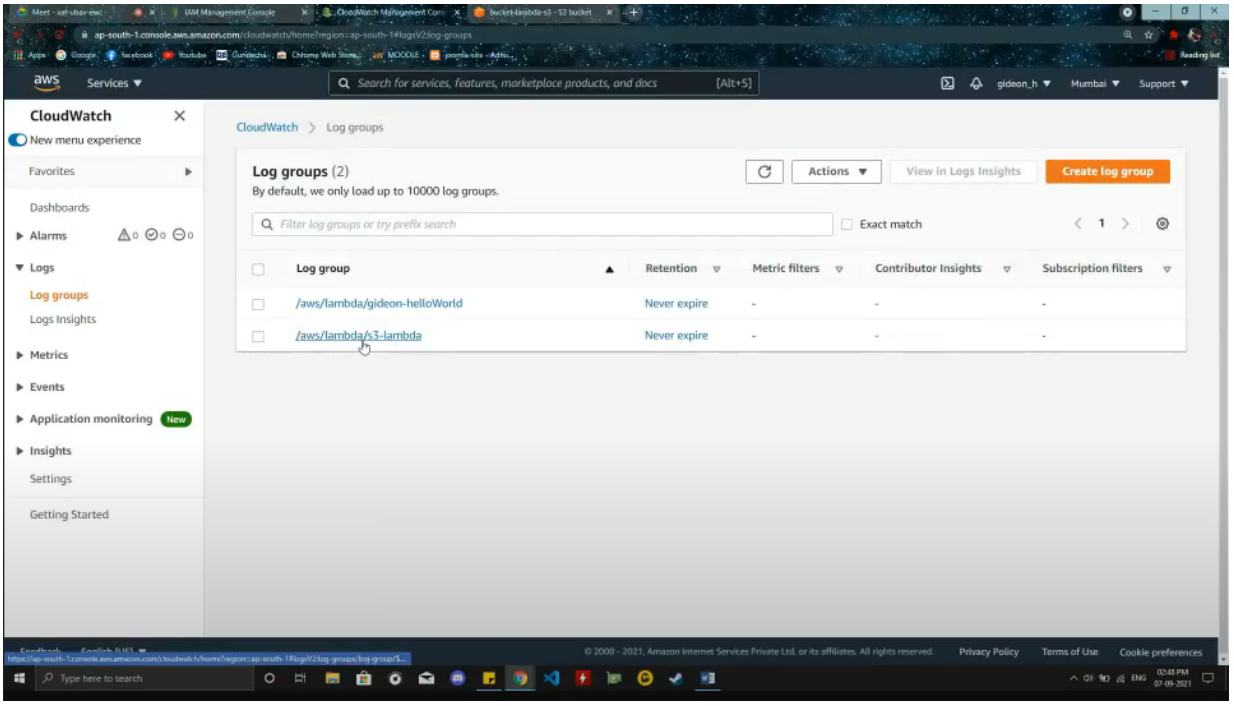
Go to File save and then click on deploy.
Now click on Test and give the event name as secondary.



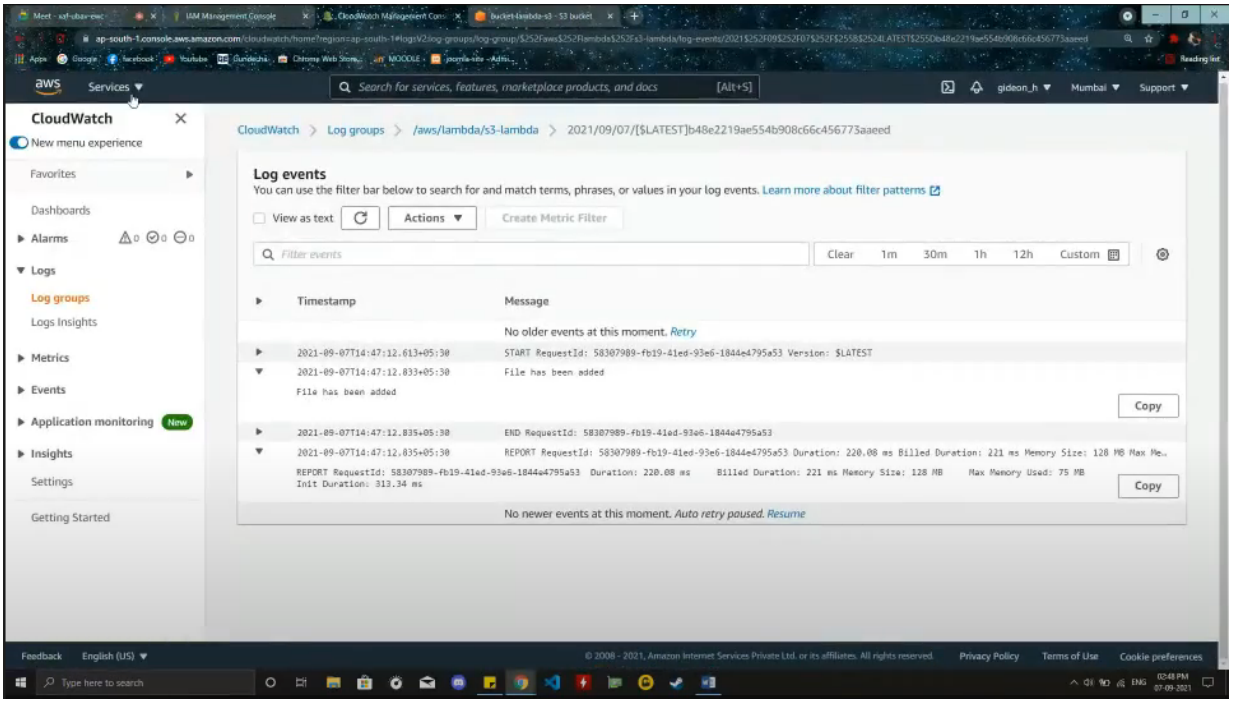
Click again on Test , it will generate an execution report of function.



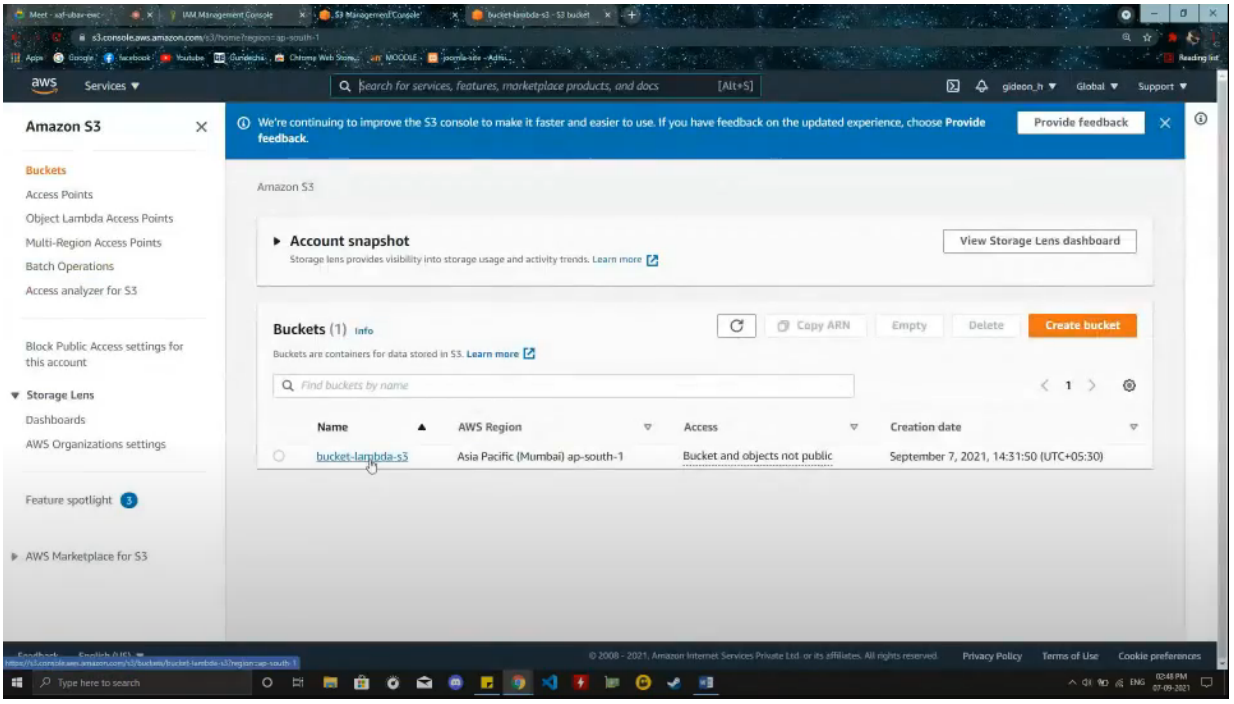
Step 4: Services, go to cloudwatch,logs,log groups. Click on the log group. Click on the latest log stream and check the output.



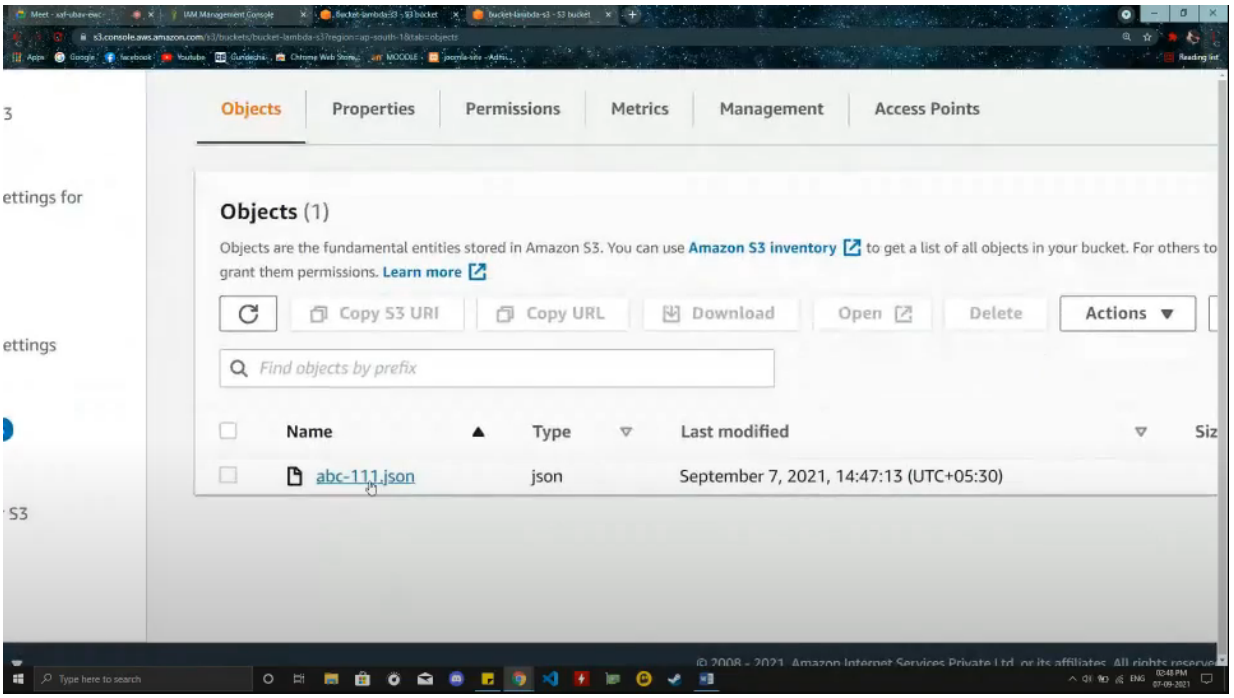
Now we have to check bucket



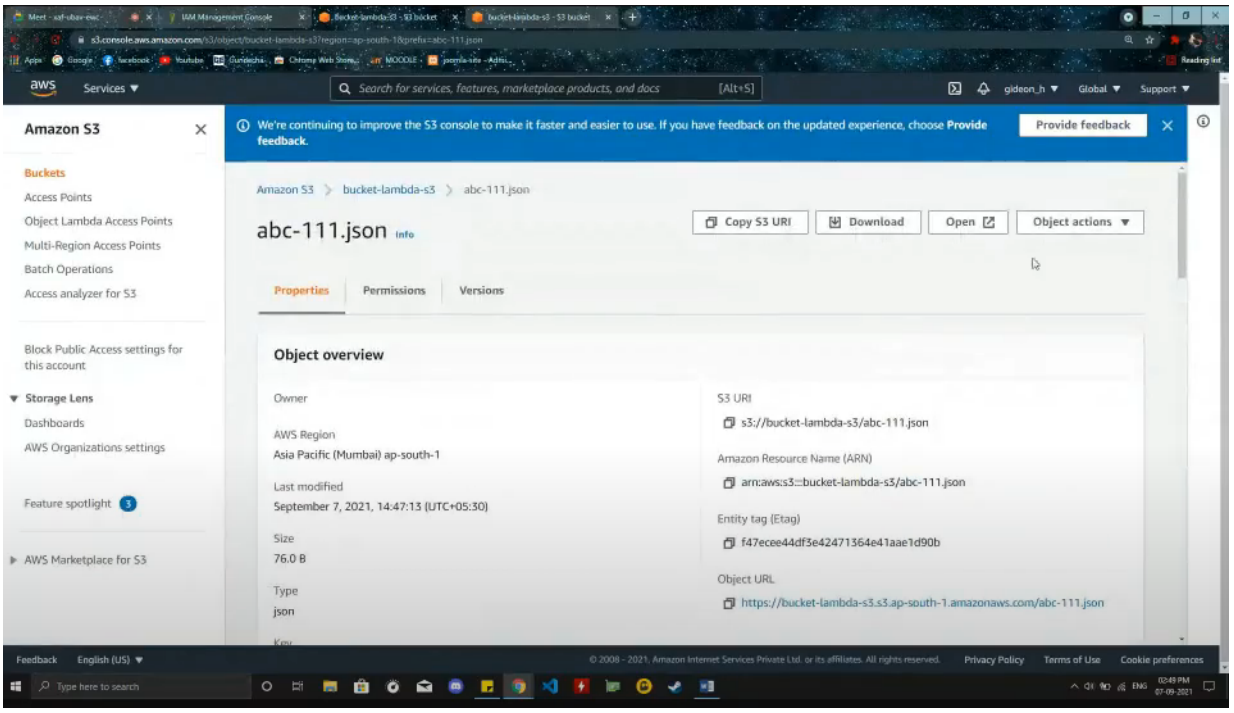
Step 5 : Go to s3…now check our created empty bucket. abc-111.json object is there in our bucket.

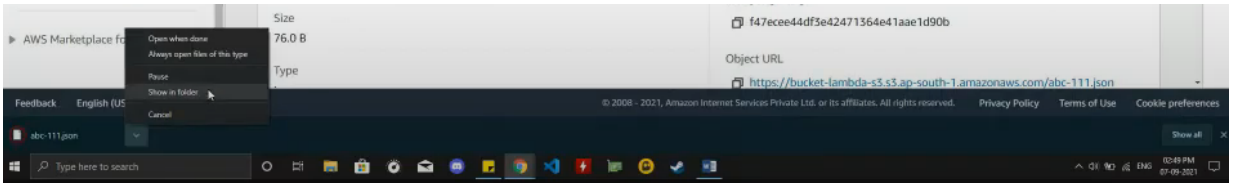


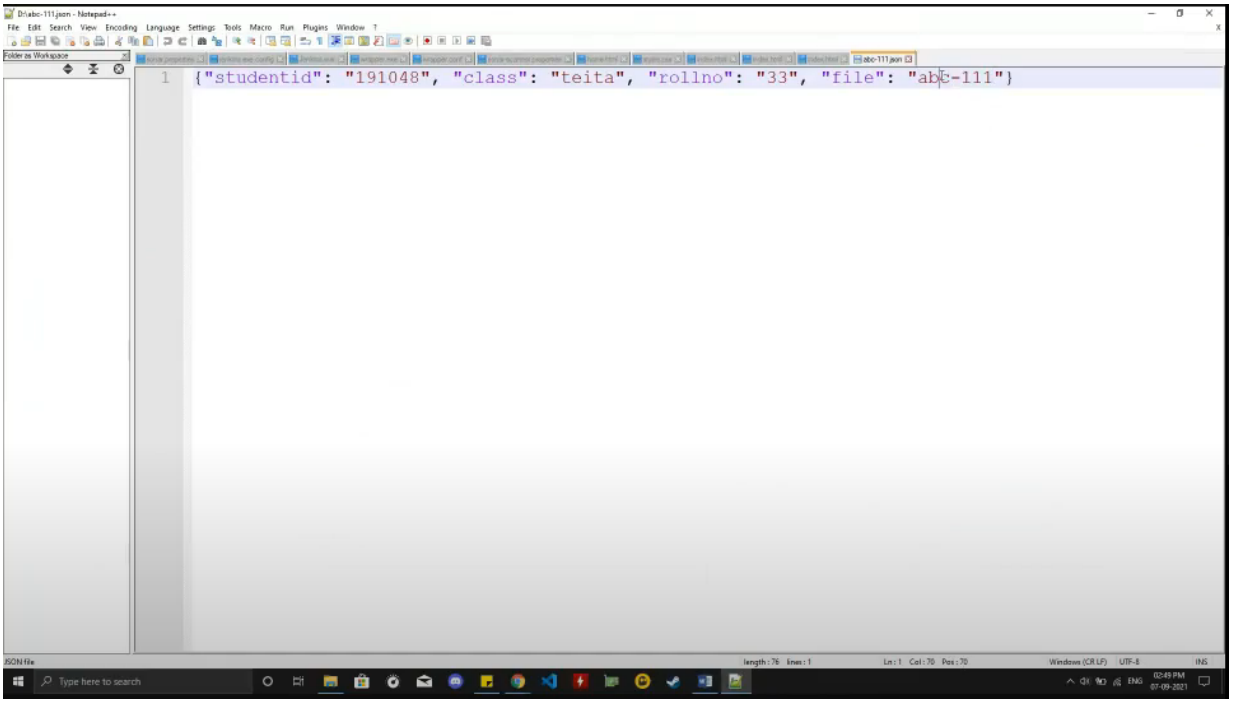
Click on object abc-111 and right most corner , click on open
It will start downloading and open that file with notepad …check the output…all fields will have values.



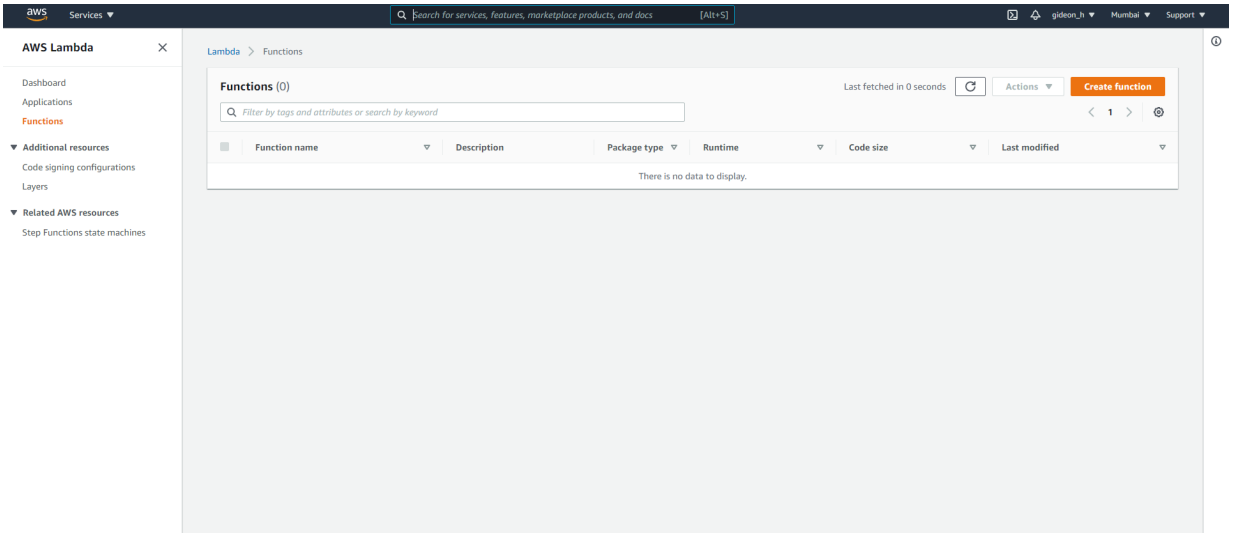
Name: Gideon Harpanahalli **Class**:TE ITA **RollNo**:33 **PID**:191048







Now delete lambda functions,s3 bucket and free up all other resources.



8. Post-Experiments Exercise

A. Extended Theory:

Nil

B. Questions:

GIDEON HARPANAHALLI

AWS ADL EXP 12 TEITA [33]

B] Questions

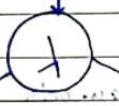
(1). Building Blocks of Lambda

Ans: The components are as follows:-

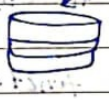
→ Event source
→ Functions
→ Services

Event Source

- Request to API endpoint
- change in data state
- Change in resource state

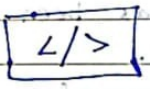


Function



Services

Databases

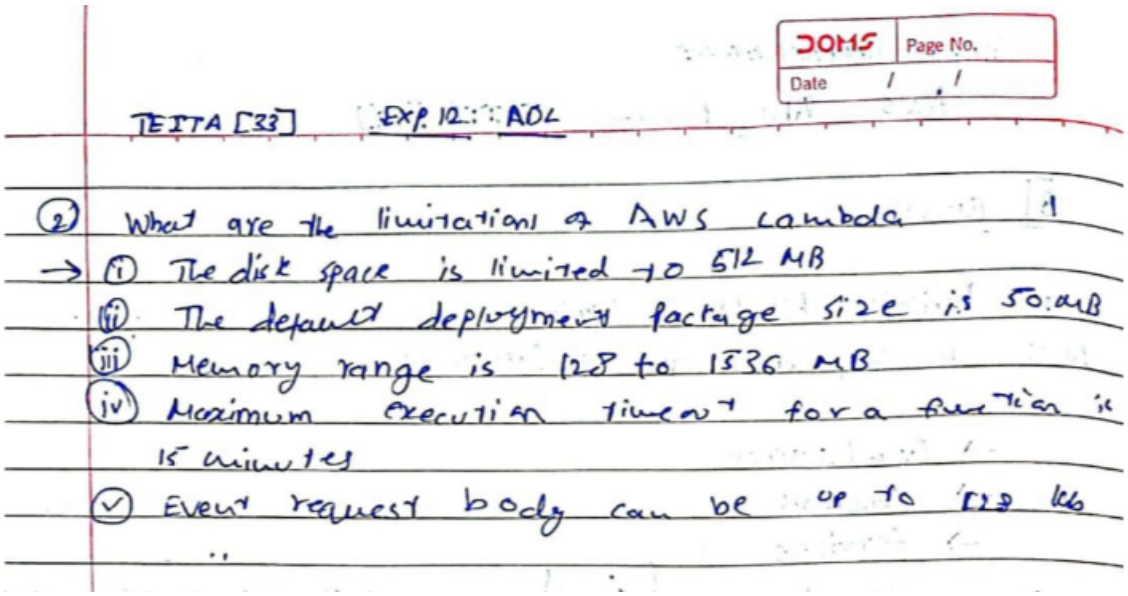


AWS or 3rd party service.

(i) Event Source :- They are known as trigger. It is the starting point of an AWS serverless flow.

(ii) Lambda Function :- It is the core component of an AWS serverless architecture.

(iii) Services :- A Lambda function is not sufficient to fulfill the needs of a business use case. It requires services like dB, auth, queues and third party system.



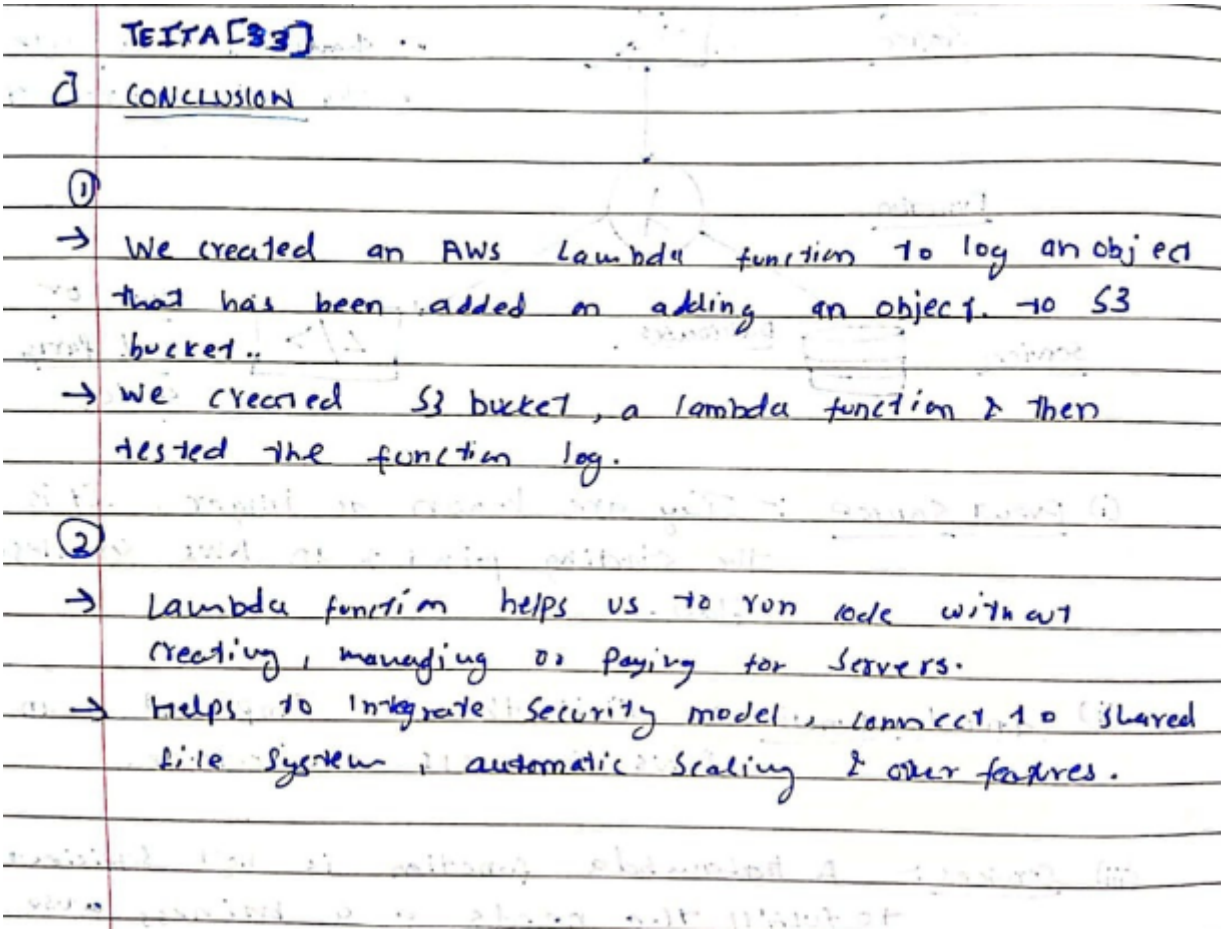
TE ITA [33] Exp. 12 :: AOL

(2) What are the limitations of AWS Lambda

→ (i) The disk space is limited to 512 MB
(ii) The default deployment package size is 50 MB
(iii) Memory range is 128 to 1536 MB
(iv) Maximum execution time out for a function is 15 minutes
(v) Event request body can be up to 128 kb

C. Conclusion:

- Write what was performed in the experiment.
- Write the significance of the topic studied in the experiment.



TE ITA [33]

CONCLUSION

(1)

→ We created an AWS Lambda function to log an object that has been added on adding an object to S3 bucket.

→ We created S3 bucket, a lambda function & then tested the function log.

(2)

→ Lambda function helps us to run code without creating, managing or paying for servers.

→ Helps to integrate security model, connect to shared file system, automatic scaling & other features.

D. References:

https://intellipaat.com/blog/tutorial/amazon-web-services-aws-tutorial/aws-lambda-tutorial/