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Hashu Advani Memorial Complex, Collector Colony, Chembur East, Mumbai - 400074.

Department of Information Technology

A.Y. 2024-25

Advance DevOps Lab
Experiment 11

Aim: To understand AWS Lambda, its workflow, various functions and create your first Lambda functions using Python / Java / Nodejs.

Roll No.	44
Name	GANESH SANJAY PANDHRE
Class	D15B
Subject	Advance DevOps Lab
LO Mapped	LO1: To understand the fundamentals of Cloud Computing and be fully proficient with Cloud based DevOps solution deployment options to meet your business requirements. LO6: To engineer a composition of nano services using AWS Lambda and Step Functions with the Serverless Framework.
Grade:	

AIM : To understand AWS Lambda, its workflow, various functions and create your first Lambda functions using Python / Java / Nodejs.

THEORY :

AWS Lambda is a serverless computing service by AWS that allows you to run code without provisioning or managing servers. You create functions in supported languages like Python, Java, and Node.js, and these functions are executed in response to specific events such as API calls, file uploads to S3, or data changes in DynamoDB.

Key Features

- Automatic Scaling: Lambda automatically scales the infrastructure to handle incoming requests, reducing operational complexity.
- Cost-Efficiency: You only pay for the compute time you consume, with no upfront costs or server management fees.
- Security: Lambda integrates with AWS Identity and Access Management (IAM) to define roles and policies, ensuring secure execution.
- Fault Tolerance: AWS Lambda is designed to provide high availability and fault tolerance, handling server failures and maintaining continuous operation.

Execution Model

Lambda functions run in stateless containers fully managed by AWS. When an event triggers a function, AWS initiates a container to execute the function. If subsequent requests come in, additional containers are spun up to handle them. AWS may keep containers warm for a short period to reduce cold start latency.

Stateless Functions

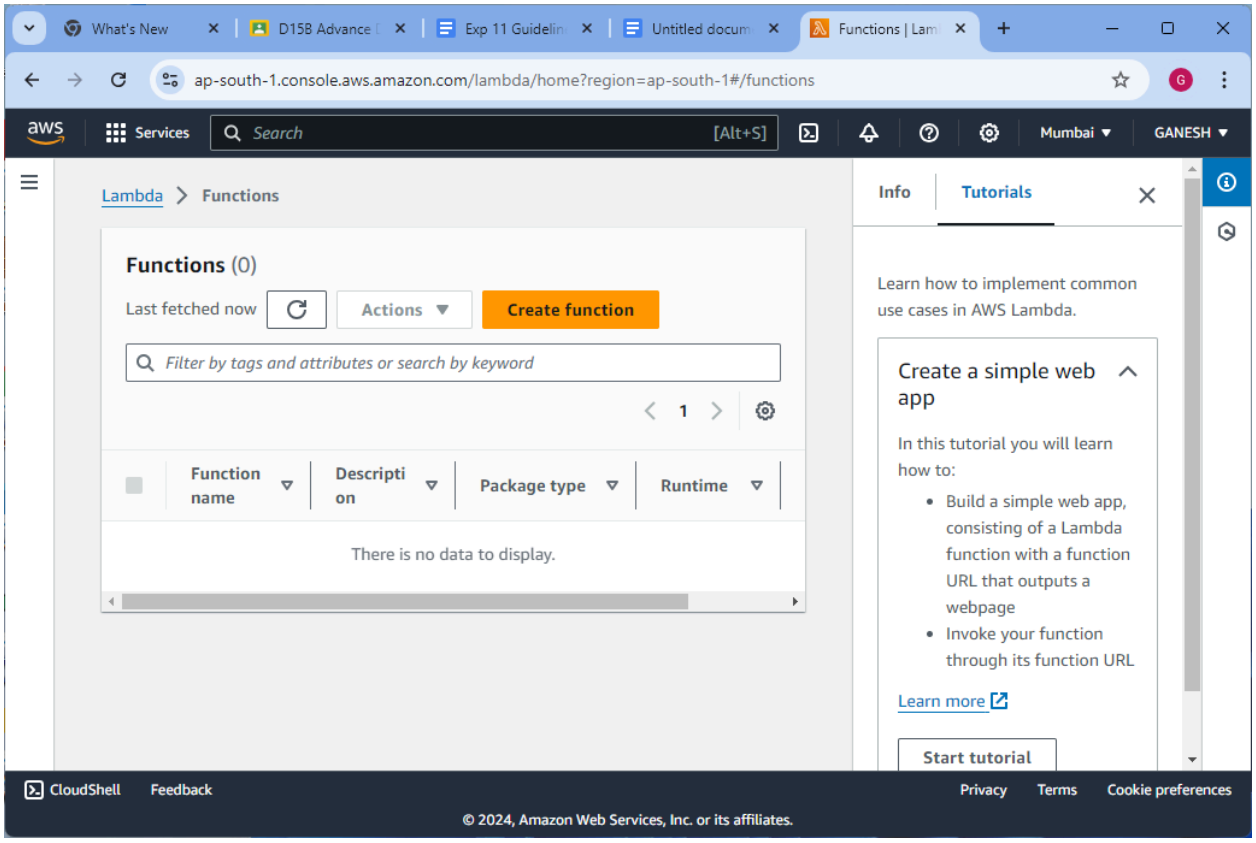
Due to the stateless nature of Lambda, each function invocation is independent, running in a fresh environment. Code outside the main handler function runs once per container lifecycle, while the handler itself runs on every invocation.

Common Use Cases

- Scalable APIs: Lambda is ideal for building APIs that need to scale according to demand. Each API request can be routed to a specific Lambda function, and the service automatically adjusts to handle varying workloads.
- Event-Driven Data Processing: Lambda excels in scenarios like real-time data processing, where functions are triggered by events from sources like S3 or DynamoDB, making it suitable for tasks like data transformation, analytics, and notifications.

Packaging and Deployment

Lambda functions, along with their dependencies, are packaged and uploaded to AWS, often using an S3 bucket. AWS Lambda then uses this package to execute the function when an event occurs. Tools like the Serverless Stack Framework (SST) can simplify this process.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1
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Package type
Runtime
There is no data to display.
Info
Tutorials
Learn how to implement common use cases in AWS Lambda.
Create a simple web app
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Build a simple web app, consisting of a Lambda function with a function URL that outputs a webpage
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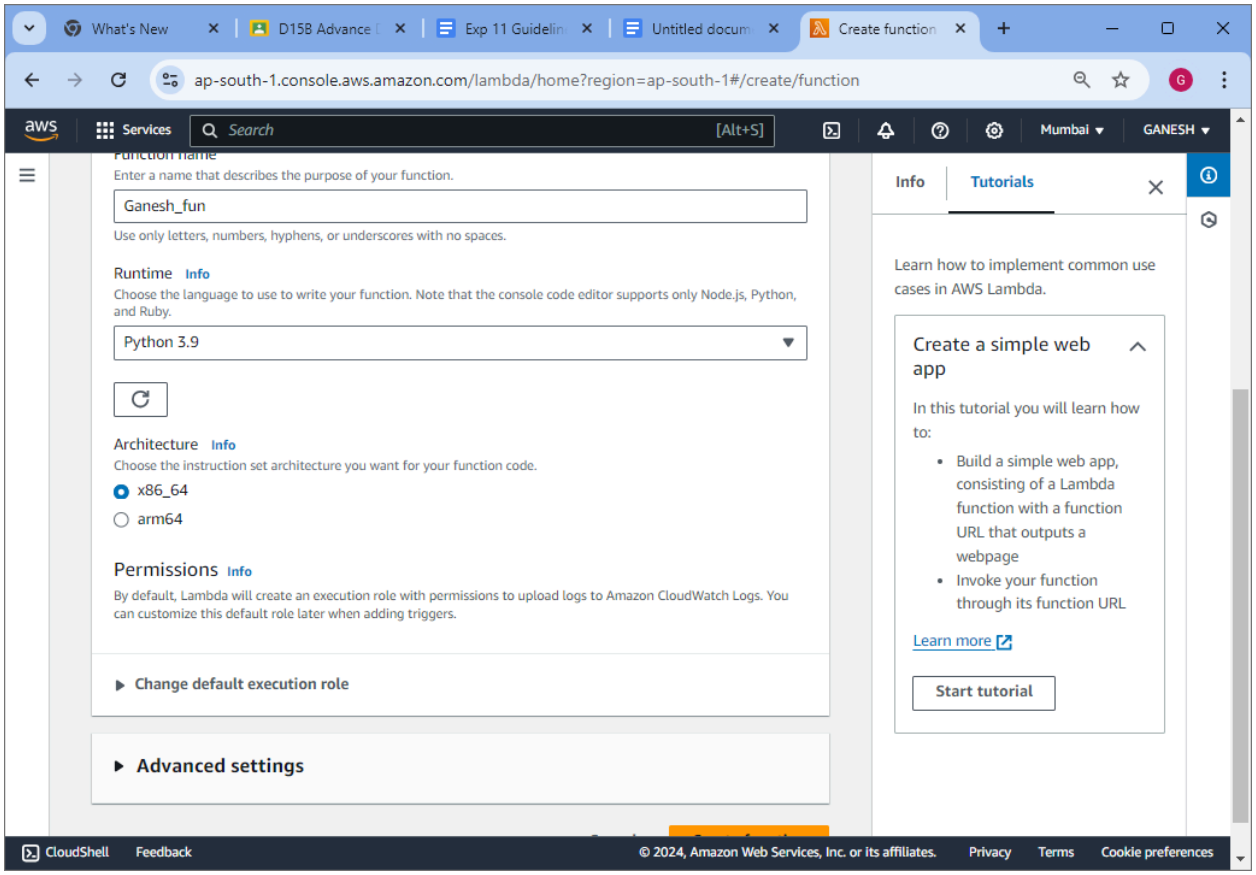
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Create function
ap-south-1.console.aws.amazon.com/lambda/home?region=ap-south-1#/create/function
aws
Services
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Mumbai
GANESH
Enter a name that describes the purpose of your function.
Ganesh_fun
Use only letters, numbers, hyphens, or underscores with no spaces.
Runtime Info
Choose the language to use to write your function. Note that the console code editor supports only Node.js, Python, and Ruby.
Python 3.9
Architecture Info
Choose the instruction set architecture you want for your function code.
x86_64
arm64
Permissions Info
By default, Lambda will create an execution role with permissions to upload logs to Amazon CloudWatch Logs. You can customize this default role later when adding triggers.
Change default execution role
Advanced settings
Info
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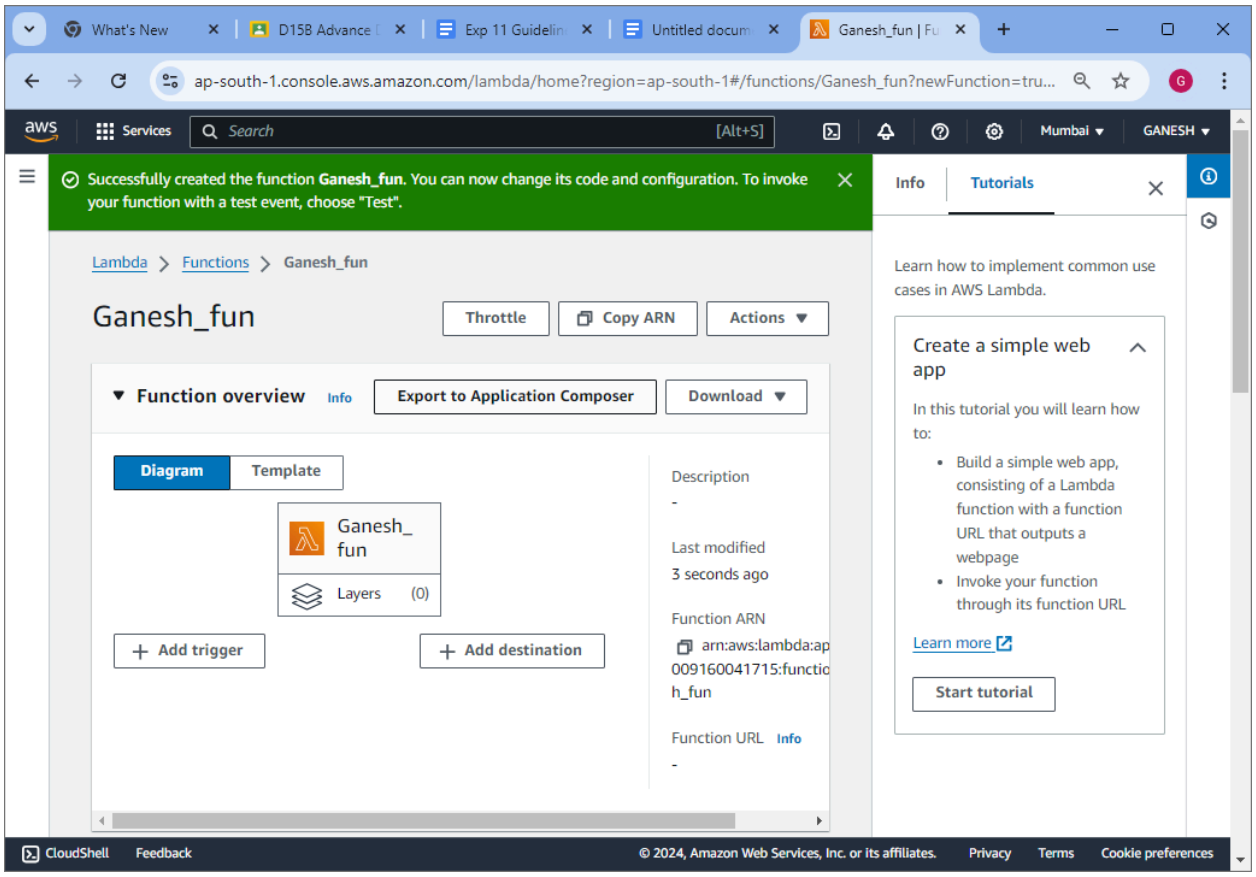
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Successfully created the function Ganesh_fun. You can now change its code and configuration. To invoke your function with a test event, choose "Test".
Info
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Lambda > Functions > Ganesh_fun
Ganesh_fun
Throttle
Copy ARN
Actions
Function overview Info
Export to Application Composer
Download
Diagram
Template
Ganesh_ fun
Layers (0)
+ Add trigger
+ Add destination
Description
-
Last modified
3 seconds ago
Function ARN
arn:aws:lambda:ap
009160041715:functio
h_fun
Function URL Info
-
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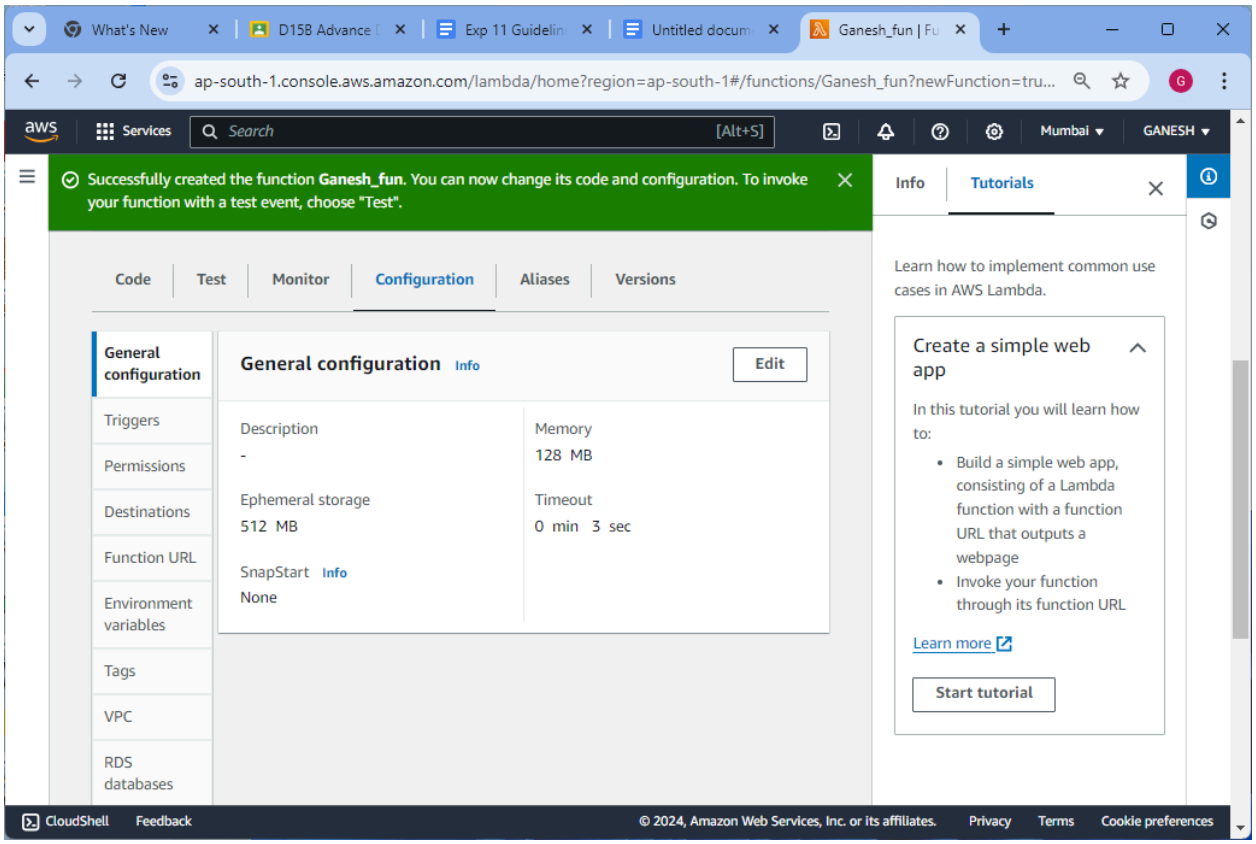
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Destinations
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Tags
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RDS databases
General configuration Info
Edit
Description
-
Memory
128 MB
Ephemeral storage
512 MB
Timeout
0 min 3 sec
SnapStart Info
None
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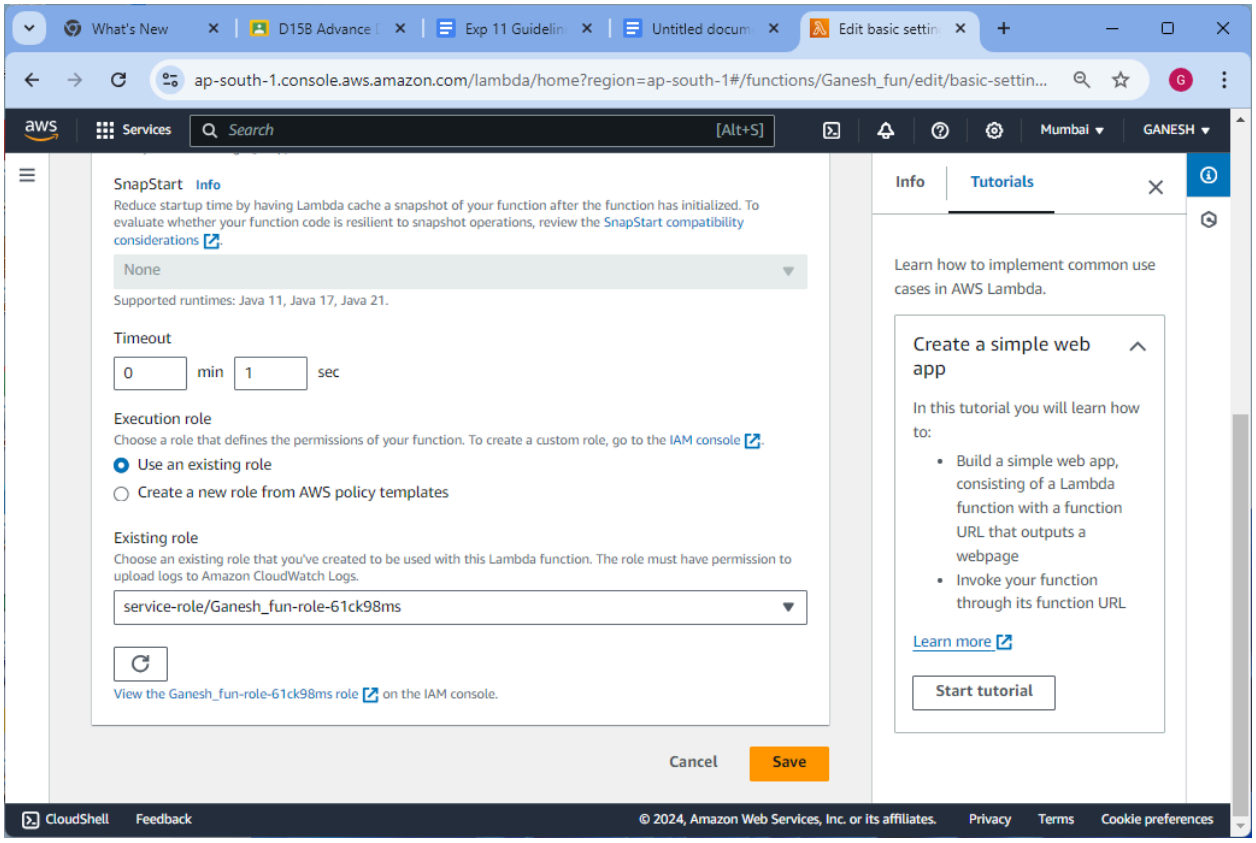
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ap-south-1.console.aws.amazon.com/lambda/home?region=ap-south-1#/functions/Ganesh_fun/edit/basic-settin...
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SnapStart Info
Reduce startup time by having Lambda cache a snapshot of your function after the function has initialized. To evaluate whether your function code is resilient to snapshot operations, review the SnapStart compatibility considerations.
None
Supported runtimes: Java 11, Java 17, Java 21.
Timeout
0 min 1 sec
Execution role
Choose a role that defines the permissions of your function. To create a custom role, go to the IAM console.
Use an existing role
Create a new role from AWS policy templates
Existing role
Choose an existing role that you've created to be used with this Lambda function. The role must have permission to upload logs to Amazon CloudWatch Logs.
service-role/Ganesh_fun-role-61ck98ms
View the Ganesh_fun-role-61ck98ms role on the IAM console.
Cancel
Save
Info
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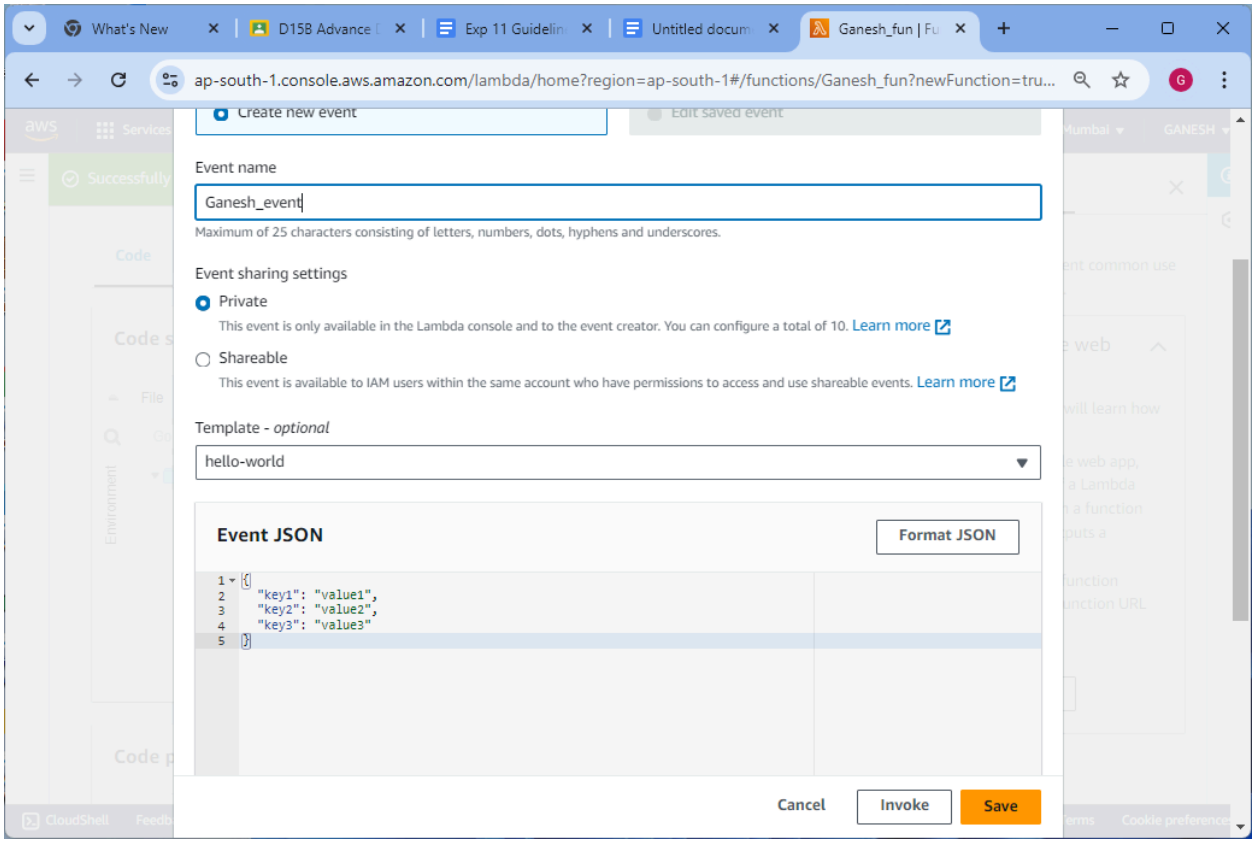
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Ganesh_fun | Fu
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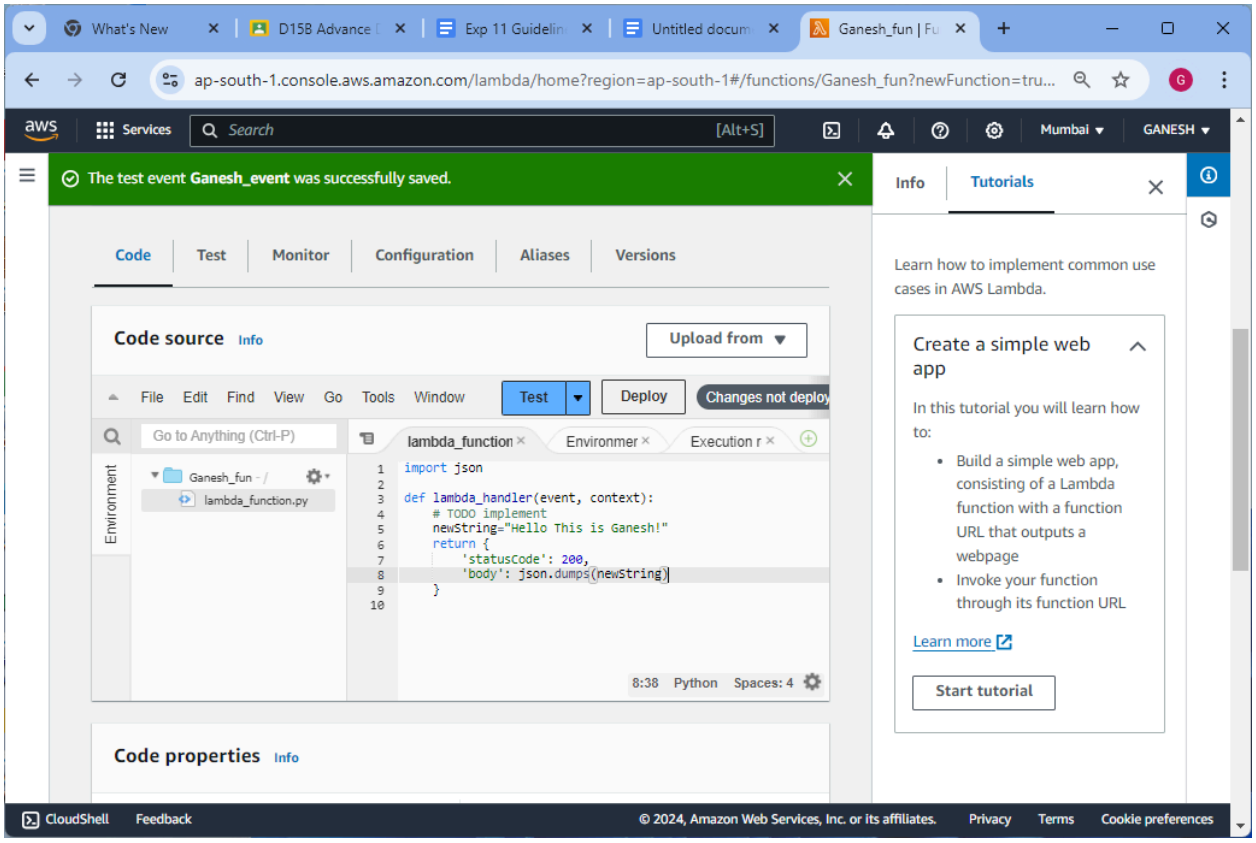
Create new event
Edit saved event
Event name
Ganesh_event
Maximum of 25 characters consisting of letters, numbers, dots, hyphens and underscores.
Event sharing settings
Private
This event is only available in the Lambda console and to the event creator. You can configure a total of 10. Learn more
Shareable
This event is available to IAM users within the same account who have permissions to access and use shareable events. Learn more
Template - optional
hello-world
Event JSON
Format JSON
{
"key1": "value1",
"key2": "value2",
"key3": "value3"
}
Cancel
Invoke
Save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The test event Ganesh_event was successfully saved.
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Versions
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Changes not deploy
Go to Anything (Ctrl-P)
lambda_function
Environmer
Execution r
Environment
Ganesh_fun - /
lambda_function.py
import json
def lambda_handler(event, context):
# TODO implement
newString="Hello This is Ganesh!"
return {
'statusCode': 200,
'body': json.dumps(newString)
}
8:38 Python Spaces: 4
Code properties Info
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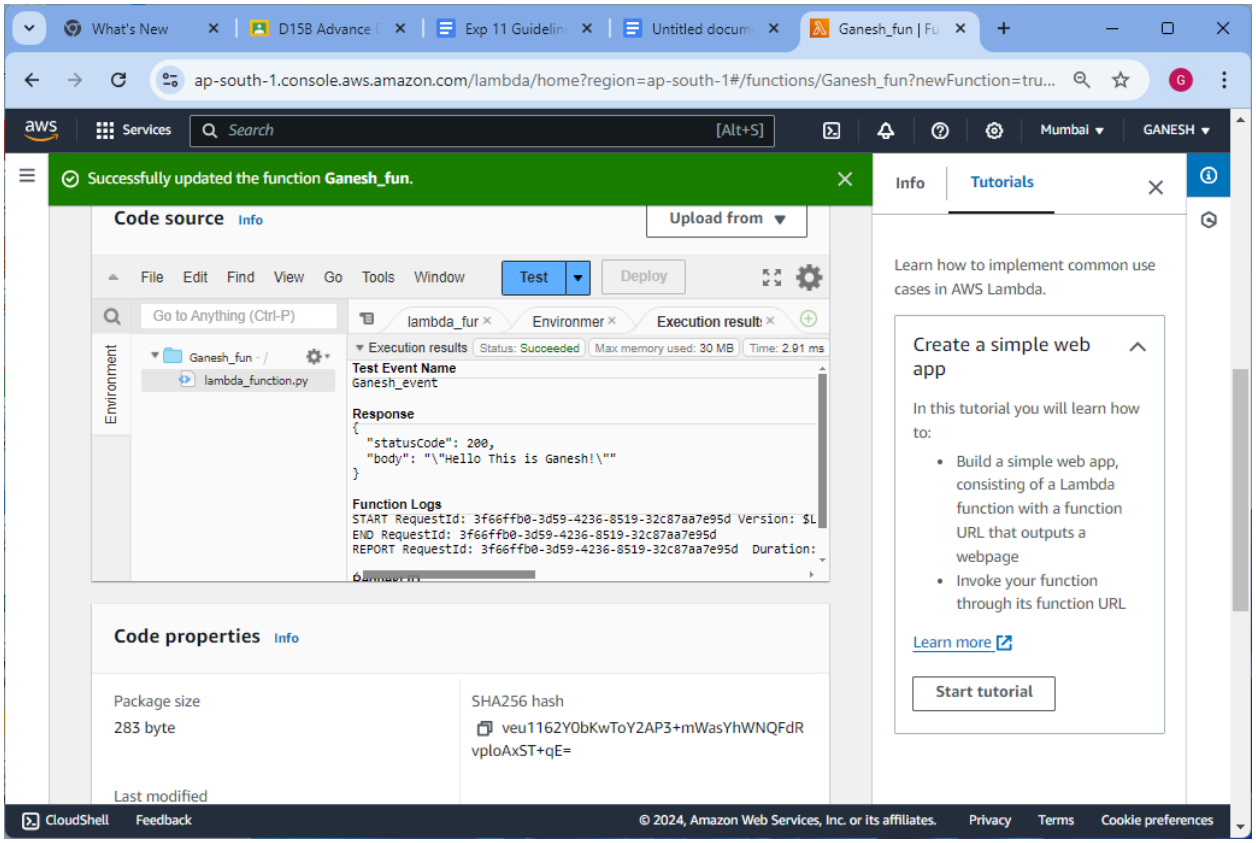
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Successfully updated the function Ganesh_fun.
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Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Go to Anything (Ctrl-P)
lambda_fur
Environmer
Execution result
Environment
Ganesh_fun - /
lambda_function.py
Execution results
Status: Succeeded
Max memory used: 30 MB
Time: 2.91 ms
Test Event Name
Ganesh_event
Response
{
"statusCode": 200,
"body": "\"Hello This is Ganesh!\""
}
Function Logs
START RequestId: 3f66ffb0-3d59-4236-8519-32c87aa7e95d Version: $L
END RequestId: 3f66ffb0-3d59-4236-8519-32c87aa7e95d
REPORT RequestId: 3f66ffb0-3d59-4236-8519-32c87aa7e95d Duration:
Code properties Info
Package size
283 byte
SHA256 hash
veu1162Y0bKwToY2AP3+mWasYhWNQFdR
vploAxST+qE=
Last modified
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CONCLUSION :

AWS Lambda simplifies the process of running code in the cloud by handling server management, scaling, and security for you. Its flexibility and cost-efficiency make it an ideal choice for a wide range of applications, from scalable APIs to real-time data processing. By leveraging AWS Lambda, you can focus on writing code while AWS takes care of the rest.