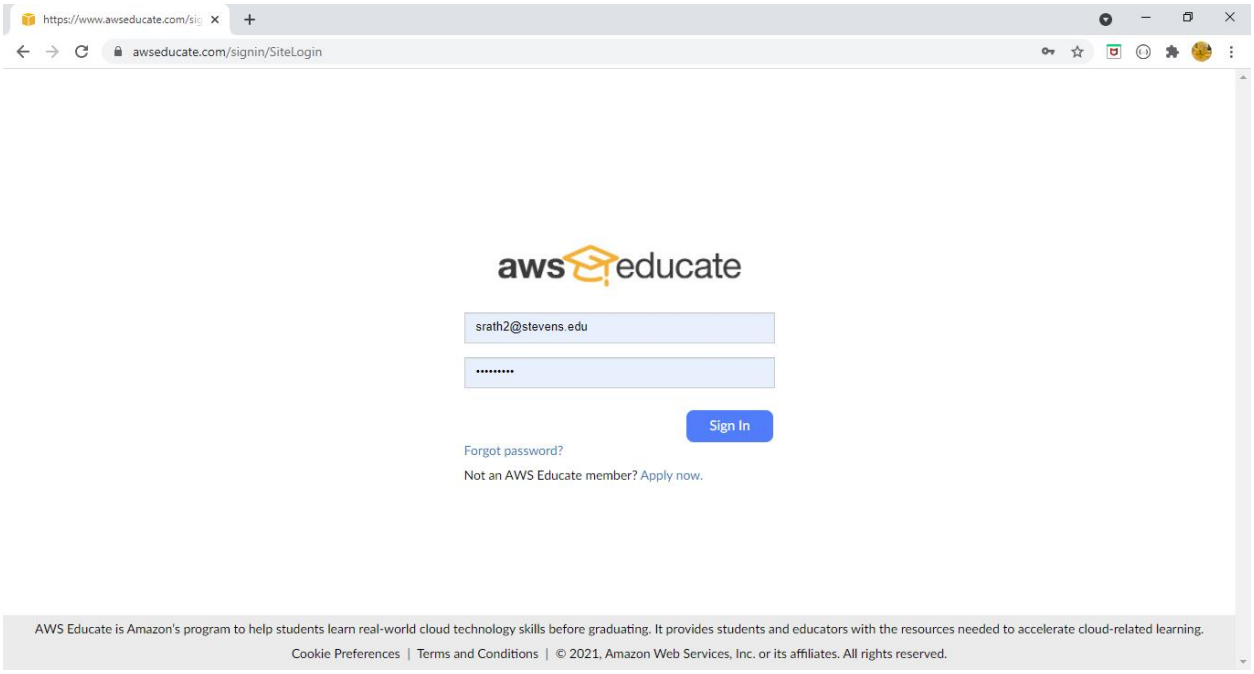
Microservice architecture – a variant of the service-oriented architecture (SOA) structural style – arranges an application as a collection of loosely coupled services. In a microservices architecture, services are fine-grained and the protocols are lightweight.
This concept (i.e.,a separate “small” *service* for each “simple” task *)* has been under consideration since early SOA times.

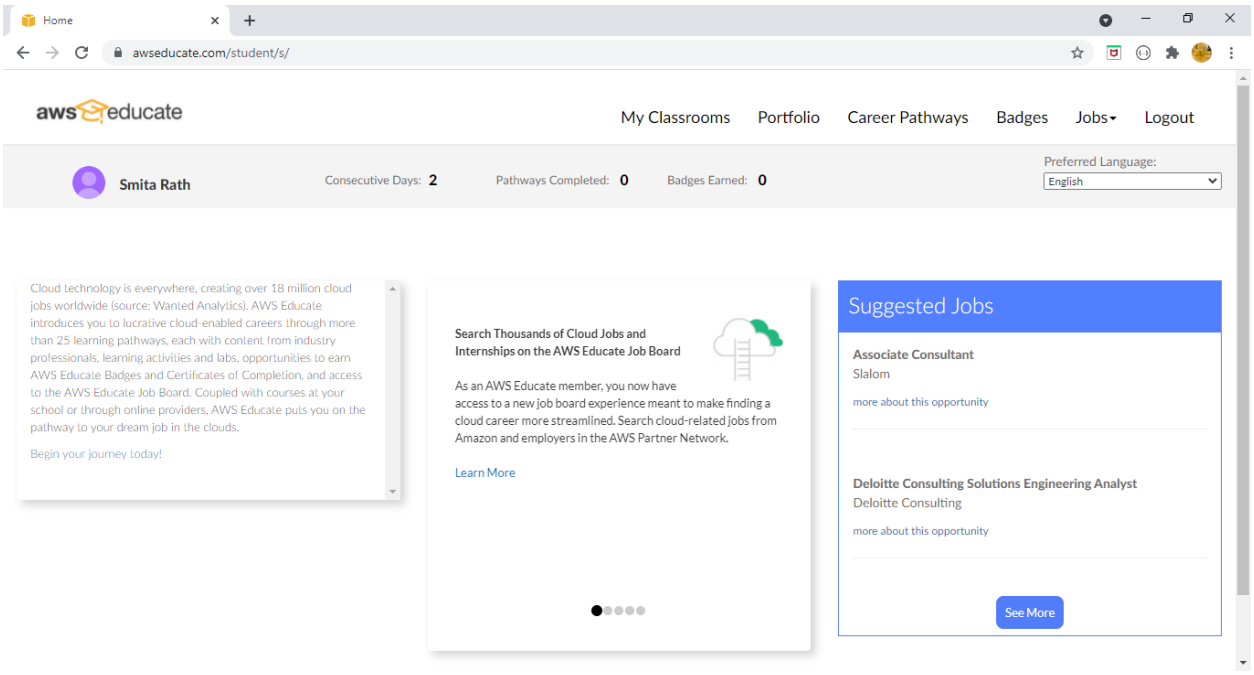
Application programming interface (**API**) is an interface that defines interactions between multiple software applications or mixed hardware-software intermediaries.[1] It defines the kinds of calls or requests that can be made, how to make them, the data formats that should be used, the conventions to follow, etc. It can also provide extension mechanisms so that users can extend existing functionality in various ways and to varying degrees.

A **REST API** (also known as RESTful API) is an application programming interface (API or web API) that conforms to the constraints of REST architectural style and allows for interaction with RESTful web services.

To create AWS lambda function I have performed below steps

Login into AWS educate account




Home
awseducate.com/student/s/
aws educate
My Classrooms
Portfolio
Career Pathways
Badges
Jobs
Logout
Smita Rath
Consecutive Days: 2
Pathways Completed: 0
Badges Earned: 0
Preferred Language:
English
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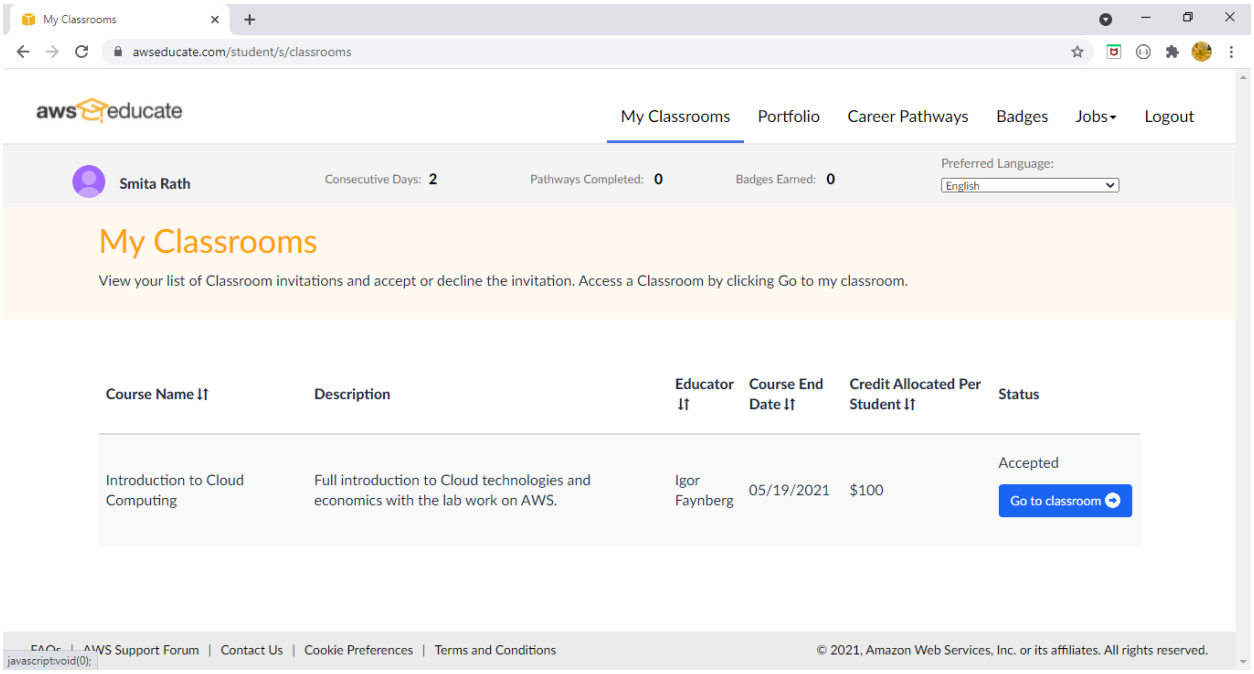
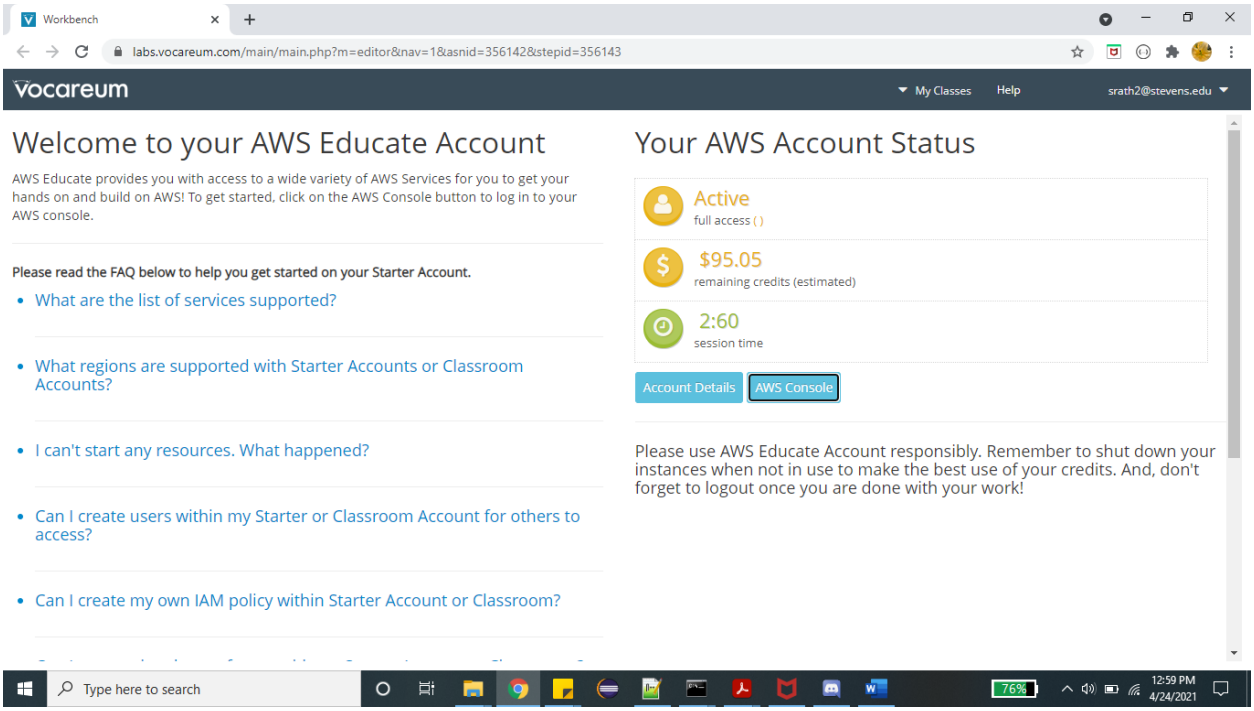
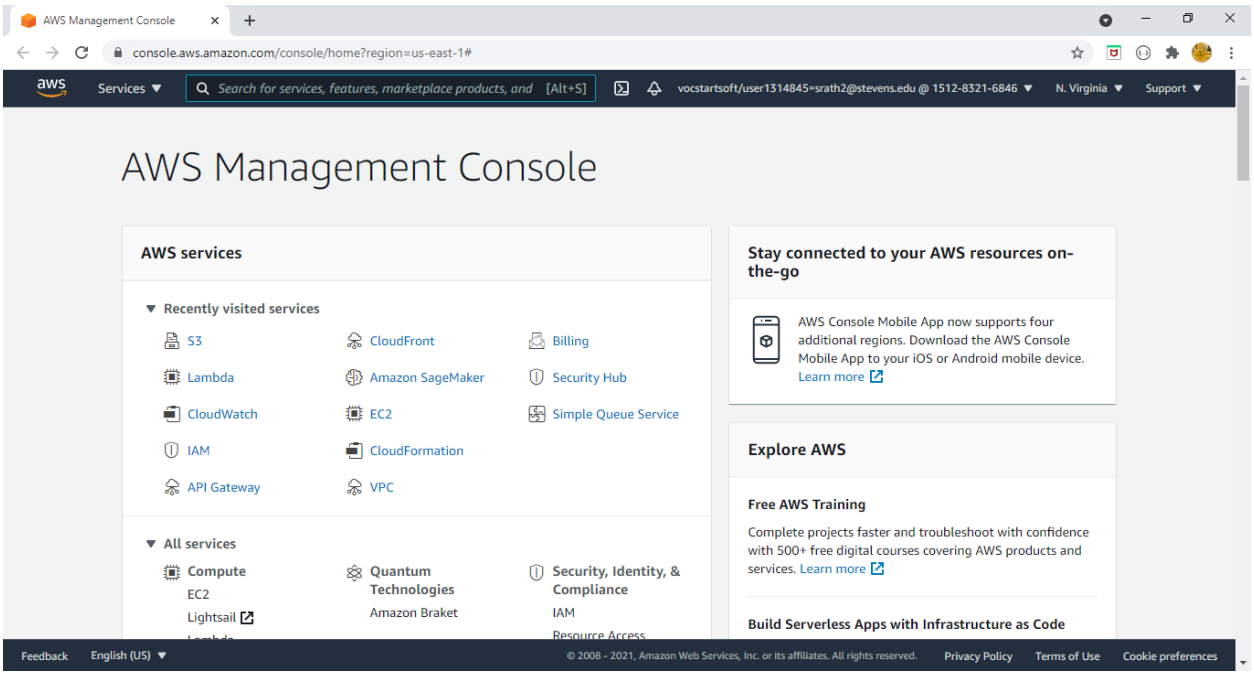
See More

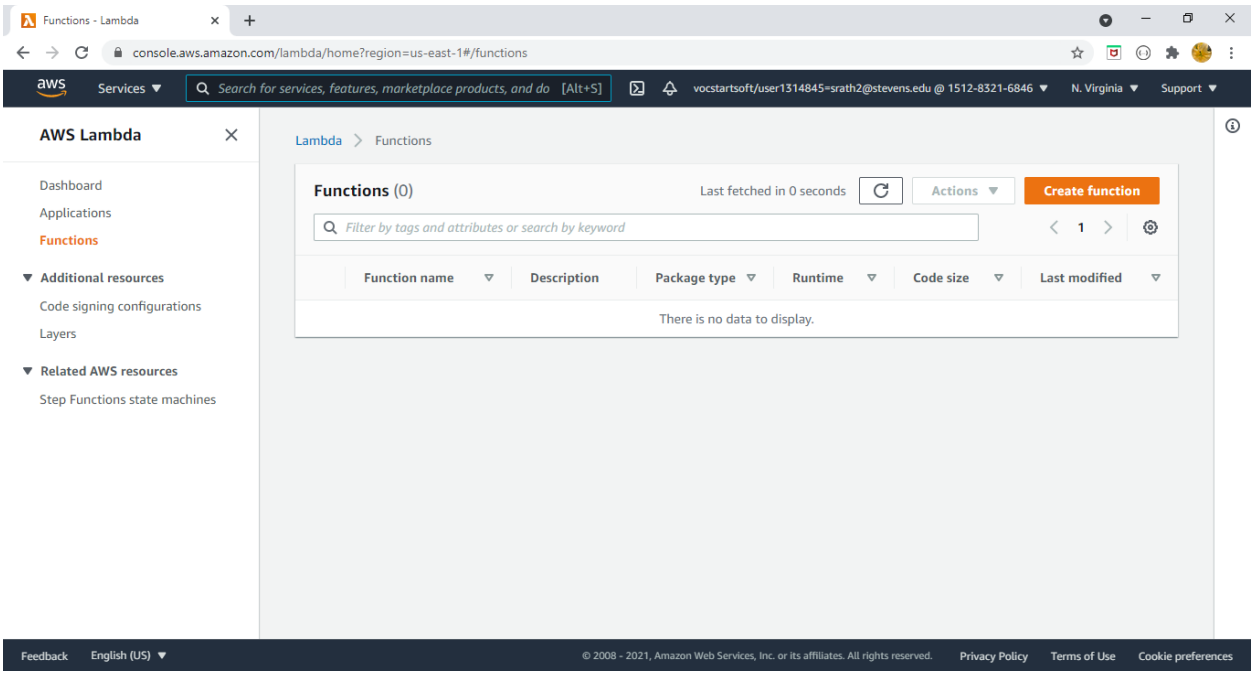

My Classrooms
awseducate.com/student/s/classrooms
aws educate
My Classrooms
Portfolio
Career Pathways
Badges
Jobs
Logout
Smita Rath
Consecutive Days: 2
Pathways Completed: 0
Badges Earned: 0
Preferred Language:
English
My Classrooms
View your list of Classroom invitations and accept or decline the invitation. Access a Classroom by clicking Go to my classroom.
Course Name
Description
Educator
Course End Date
Credit Allocated Per Student
Status
Introduction to Cloud Computing
Full introduction to Cloud technologies and economics with the lab work on AWS.
Igor Faynberg
05/19/2021
$100
Accepted
Go to classroom
AWS Support Forum | Contact Us | Cookie Preferences | Terms and Conditions
© 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved.
javascript:void(0);



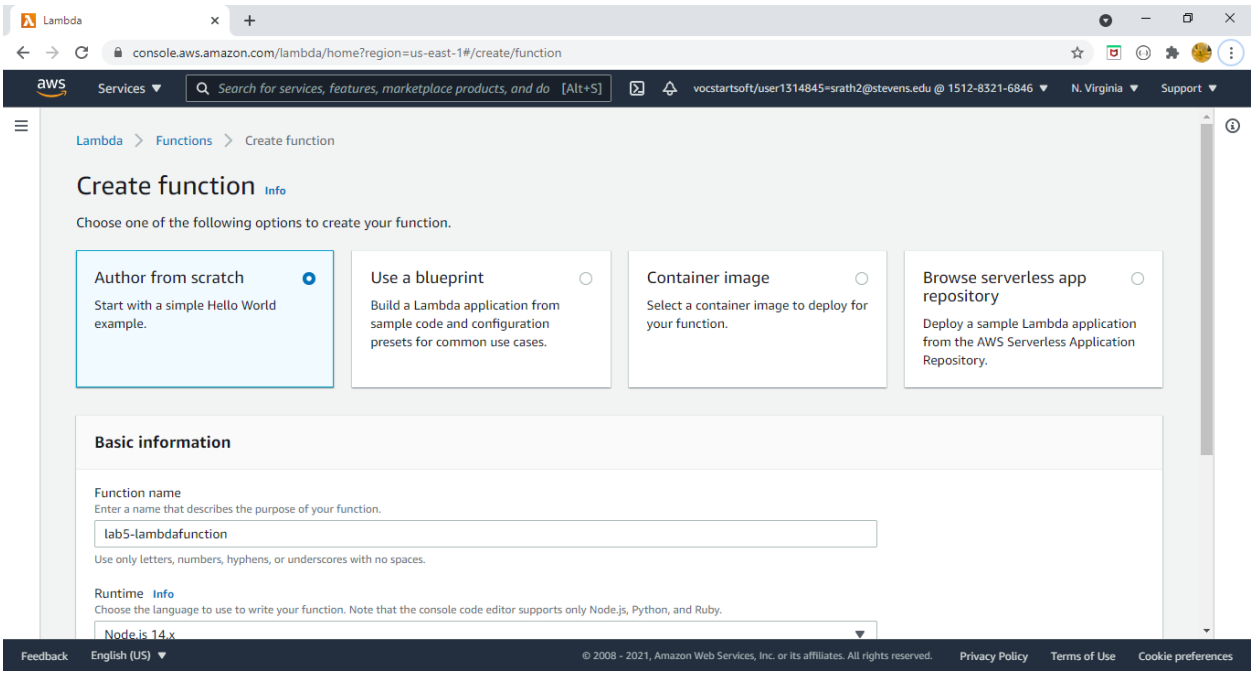
Go to AWS management console and select Lambda



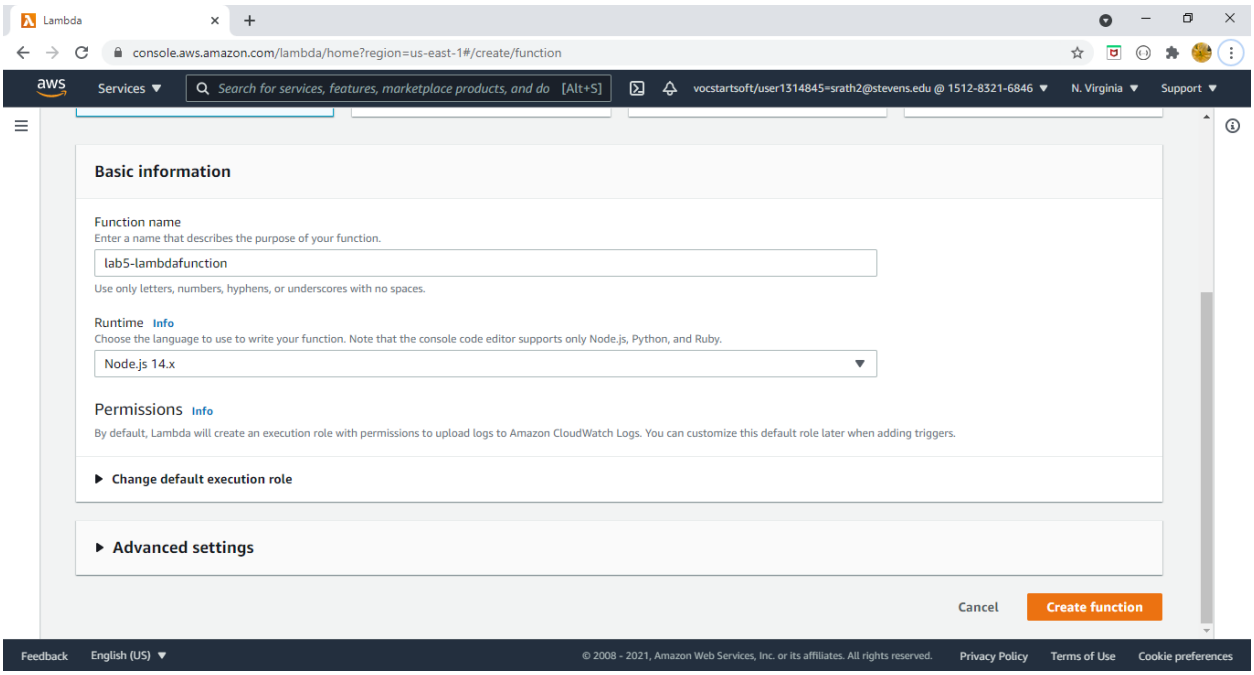
Click on click lambda



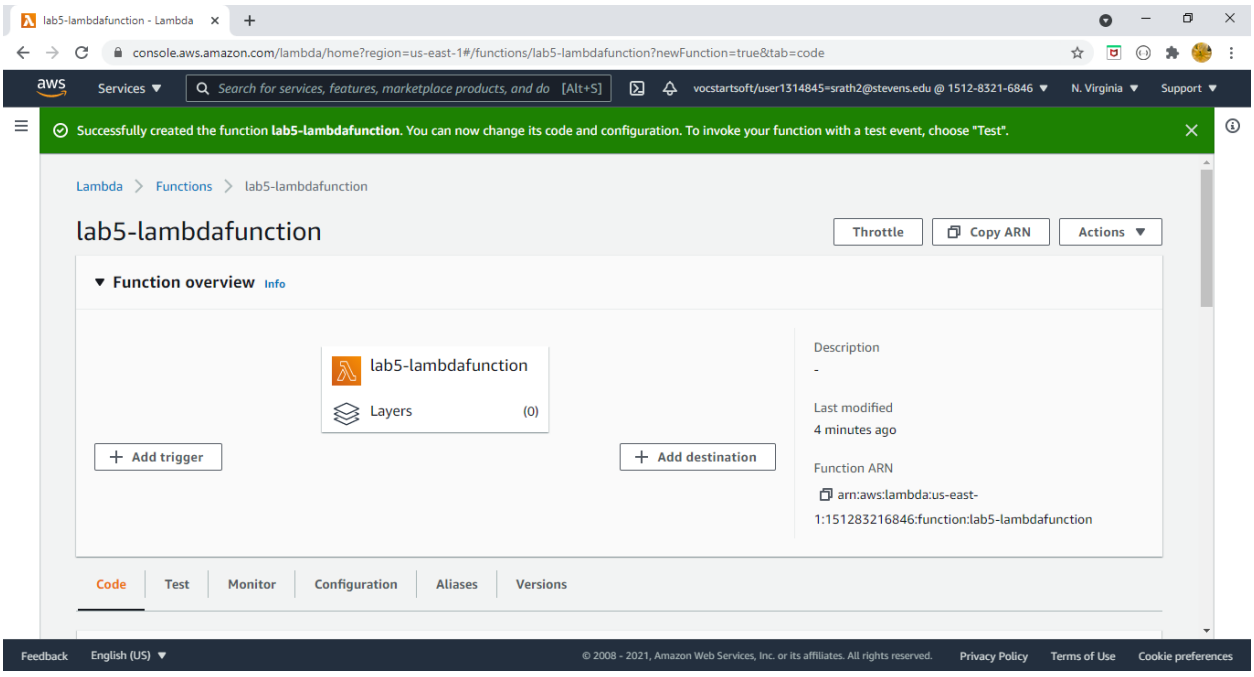
Different options available for creation I chose author from scratch and provided the function name



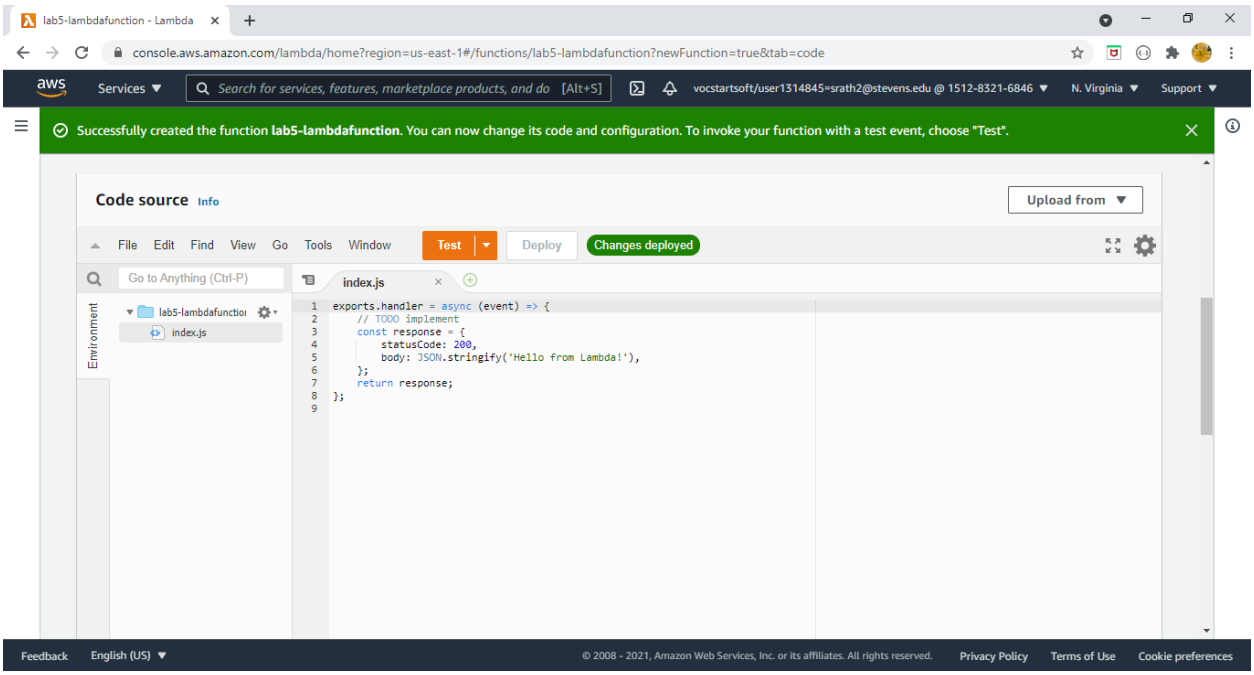
Click on create function.



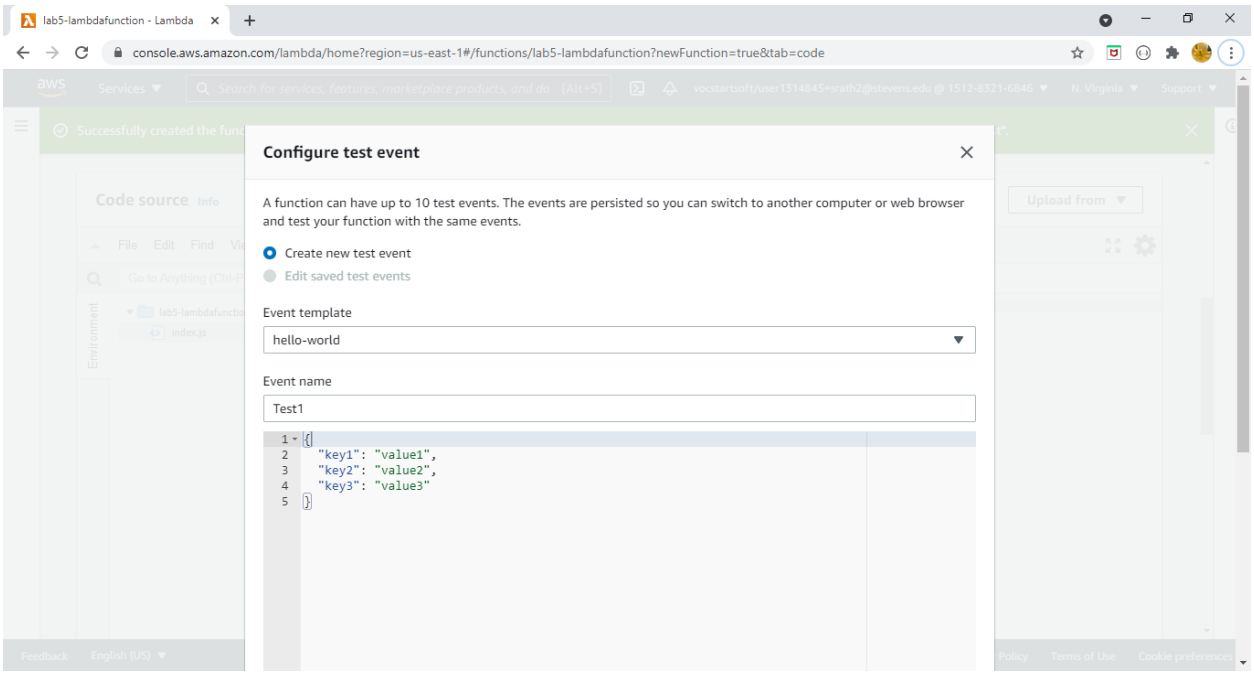
Lambda function created

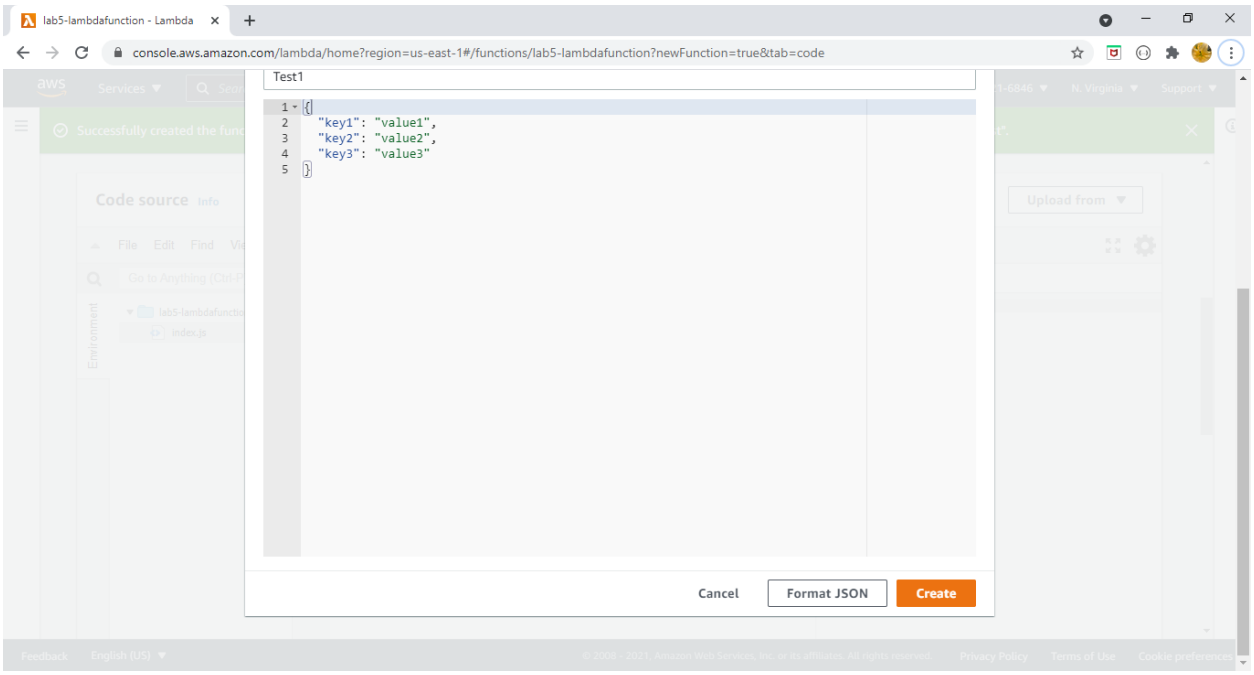


In the code source, code can be edited to changes the lambda function functionality

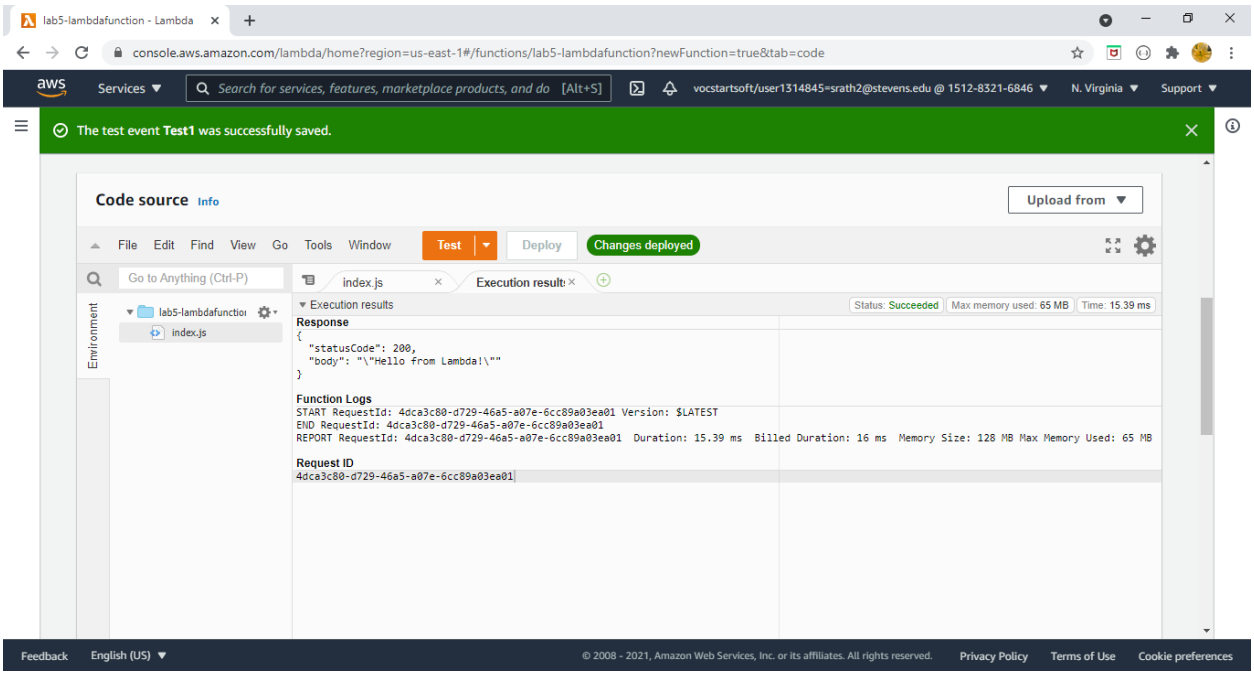


Under test, test event can be create to invoke the lambda function

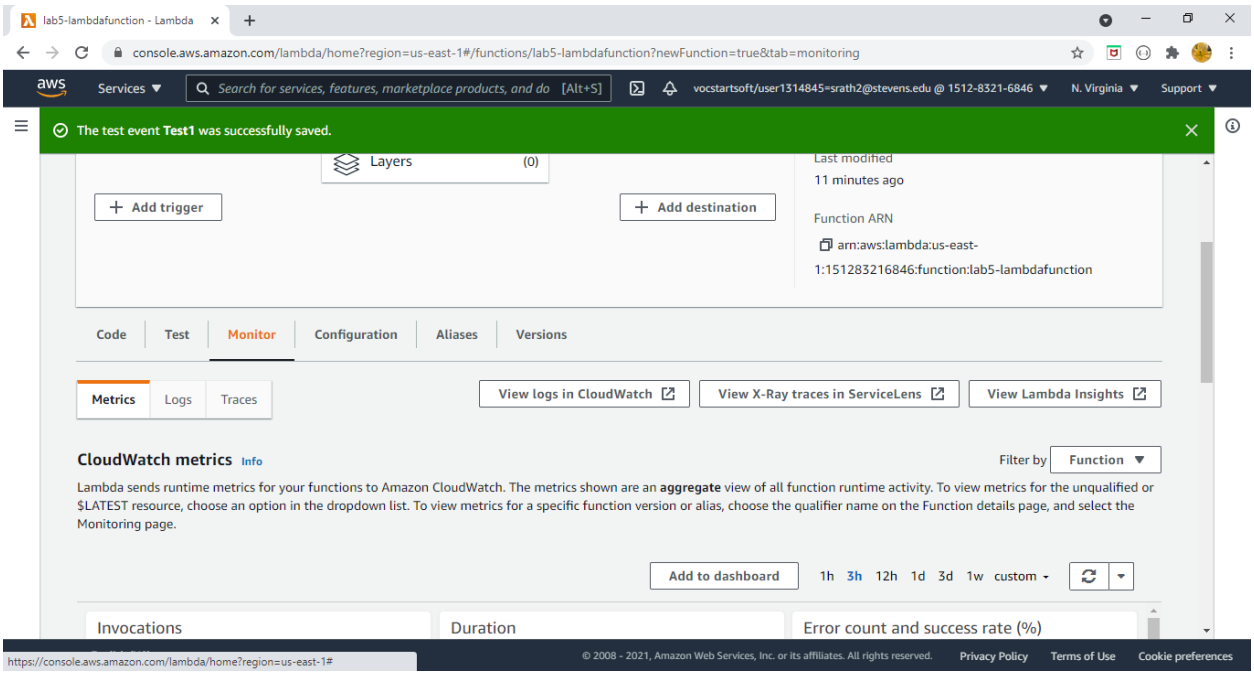




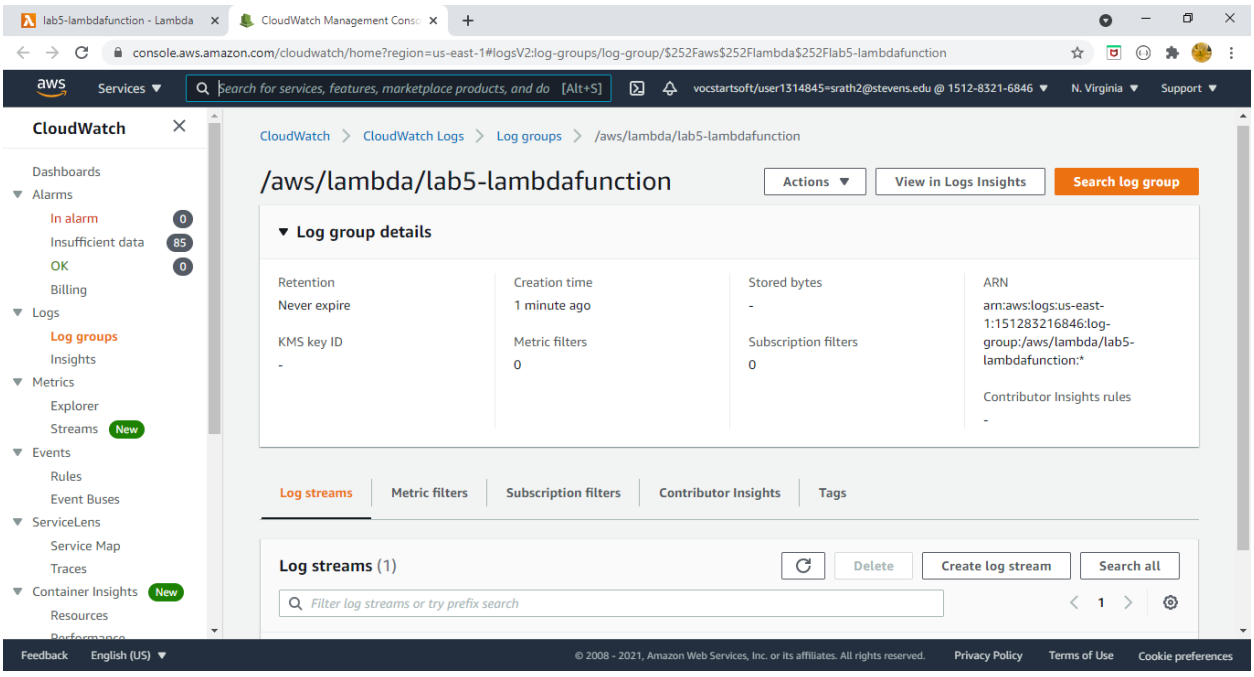
After clicking on test, we can see the response of the test whether it is succeeded or not.

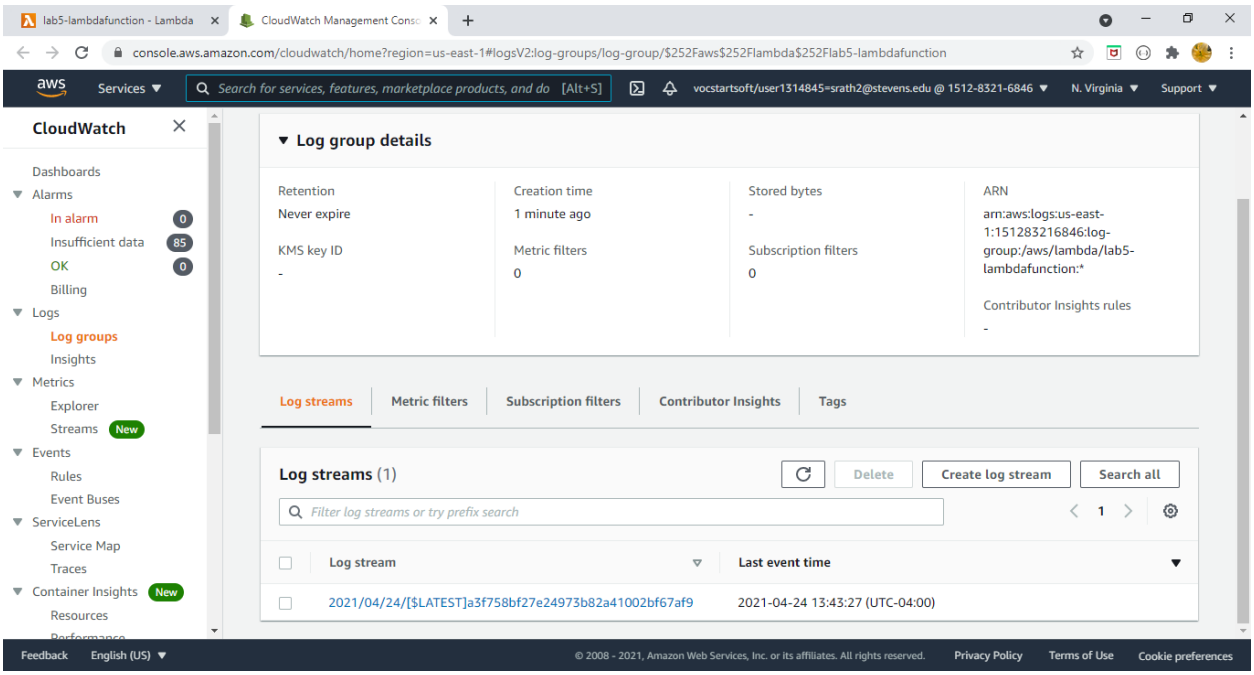


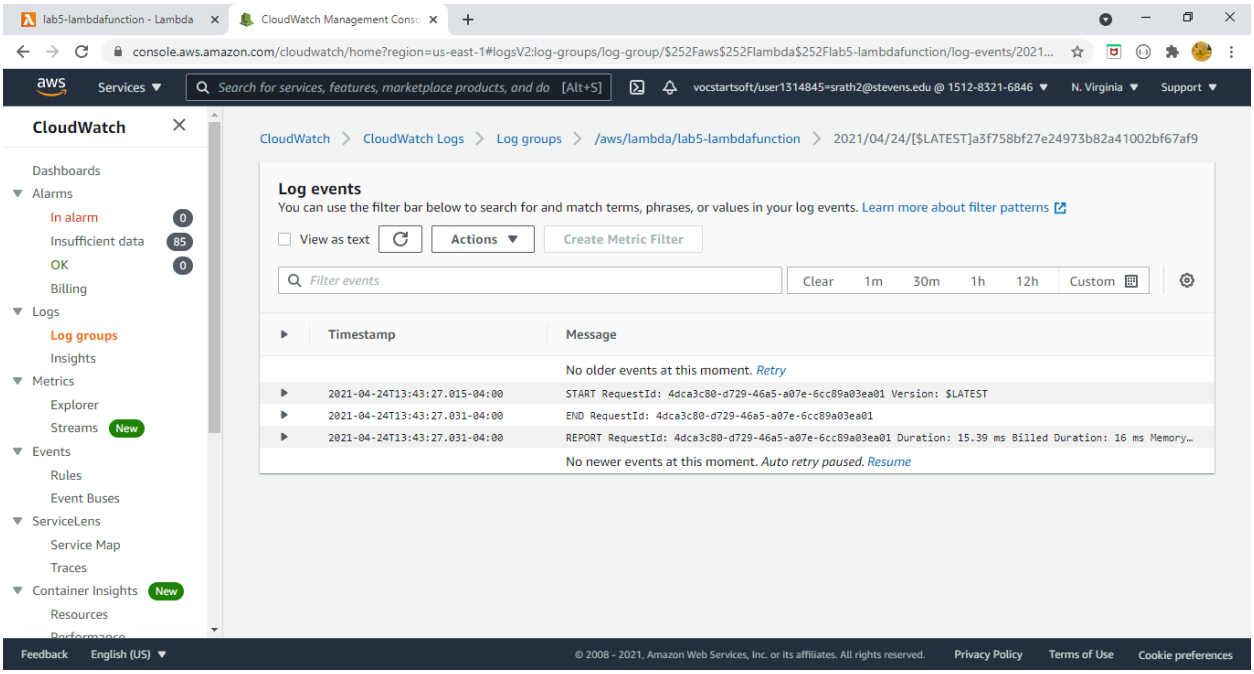
Then we can see the logs under view logs in CloudWatch



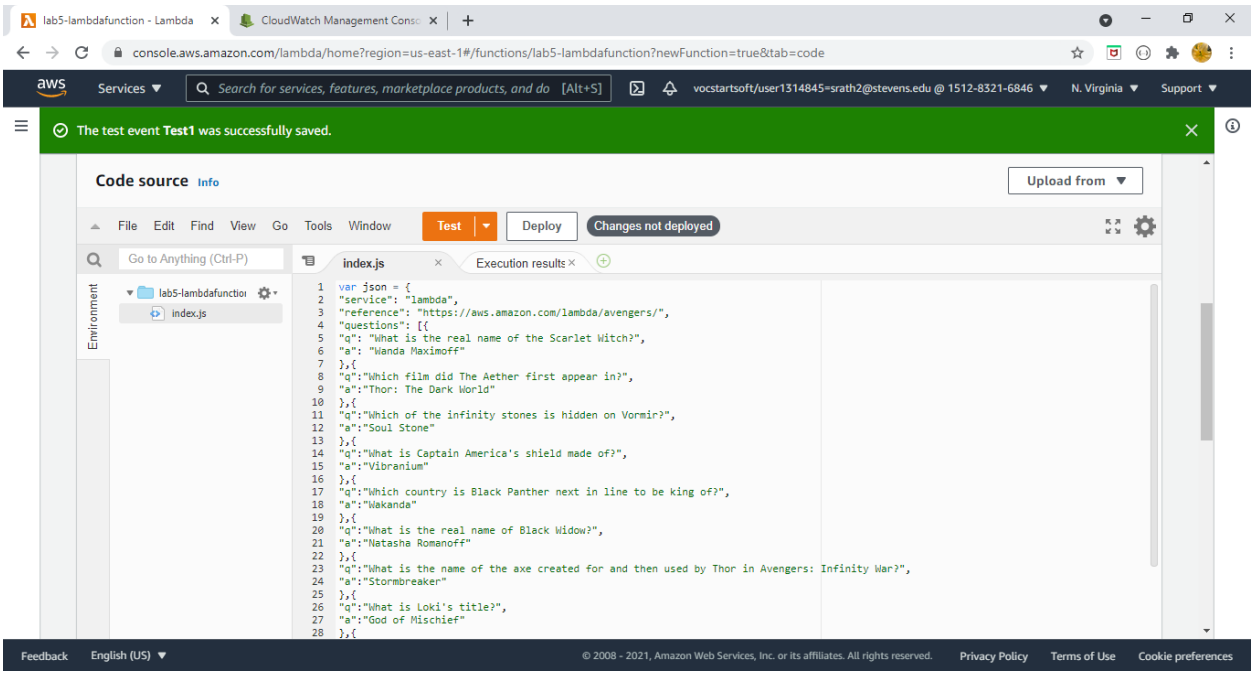
Once I clicked on view logs in CloudWatch, it will give the details for request and response.







Under code source I copied the provided code and deployed the changes.


lab5-lambdafunction - Lambda
CloudWatch Management Conso
console.aws.amazon.com/lambda/home?region=us-east-1#/functions/lab5-lambdafunction?newFunction=true&tab=code
Services
Search for services, features, marketplace products, and do [Alt+S]
vocstartsoft/user1314845=srath2@stevens.edu @ 1512-8321-6846
N. Virginia
Support
The test event Test1 was successfully saved.
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Changes not deployed
Go to Anything (Ctrl-P)
index.js
Execution results
Environment
lab5-lambdafunctio
index.js
var json = {
"service": "lambda",
"reference": "https://aws.amazon.com/lambda/avengers/",
"questions": [{
"q": "What is the real name of the Scarlet Witch?",
"a": "Wanda Maximoff"
},{
"q":"Which film did The Aether first appear in?",
"a":"Thor: The Dark World"
},{
"q":"Which of the infinity stones is hidden on Vormir?",
"a":"Soul Stone"
},{
"q":"What is Captain America's shield made of?",
"a":"Vibranium"
},{
"q":"Which country is Black Panther next in line to be king of?",
"a":"Wakanda"
},{
"q":"What is the real name of Black Widow?",
"a":"Natasha Romanoff"
},{
"q":"What is the name of the axe created for and then used by Thor in Avengers: Infinity War?",
"a":"Stormbreaker"
},{
"q":"What is Loki's title?",
"a":"God of Mischief"
},{
Feedback
English (US)
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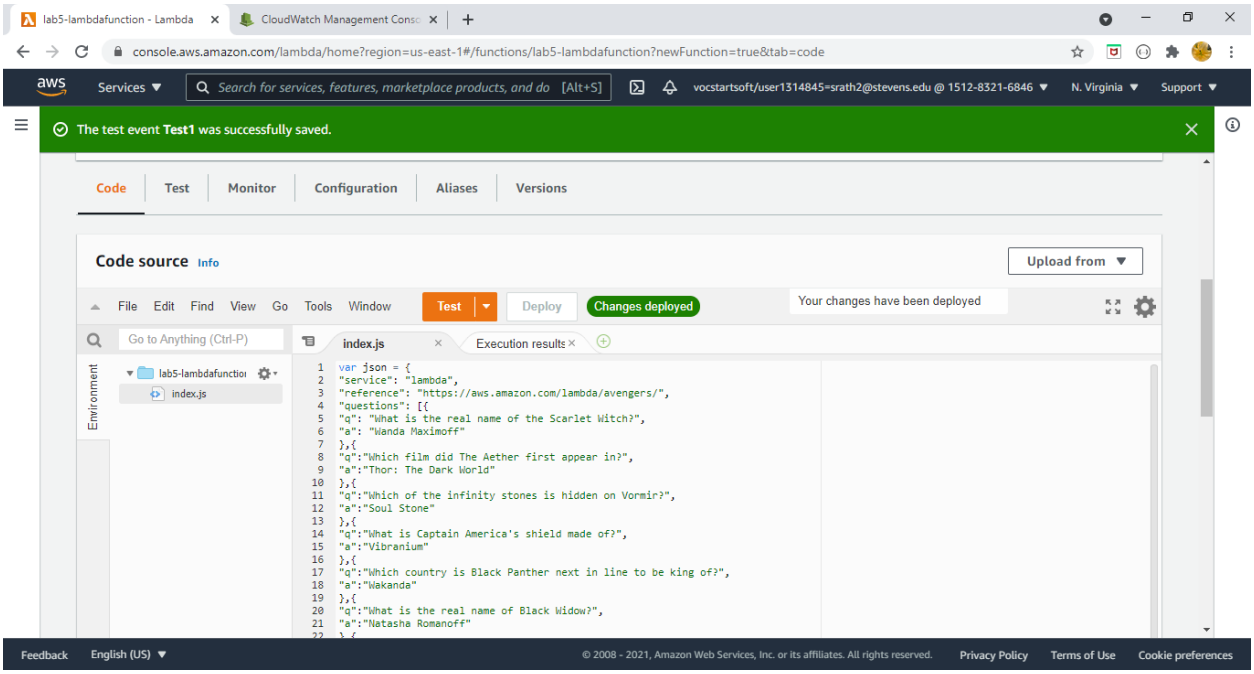
lab5-lambdafunction - Lambda
CloudWatch Management Conso
console.aws.amazon.com/lambda/home?region=us-east-1#/functions/lab5-lambdafunction?newFunction=true&tab=code
Services
Search for services, features, marketplace products, and do [Alt+S]
vocstartsoft/user1314845=srath2@stevens.edu @ 1512-8321-6846
N. Virginia
Support
The test event Test1 was successfully saved.
Code
Test
Monitor
Configuration
Aliases
Versions
Code source Info
Upload from
File Edit Find View Go Tools Window
Test
Deploy
Changes deployed
Your changes have been deployed
Go to Anything (Ctrl-P)
index.js
Execution results
Environment
lab5-lambdafunctio
index.js
var json = {
"service": "lambda",
"reference": "https://aws.amazon.com/lambda/avengers/",
"questions": [{
"q": "What is the real name of the Scarlet Witch?",
"a": "Wanda Maximoff"
},{
"q":"Which film did The Aether first appear in?",
"a":"Thor: The Dark World"
},{
"q":"Which of the infinity stones is hidden on Vormir?",
"a":"Soul Stone"
},{
"q":"What is Captain America's shield made of?",
"a":"Vibranium"
},{
"q":"Which country is Black Panther next in line to be king of?",
"a":"Wakanda"
},{
"q":"What is the real name of Black Widow?",
"a":"Natasha Romanoff"
Feedback
English (US)
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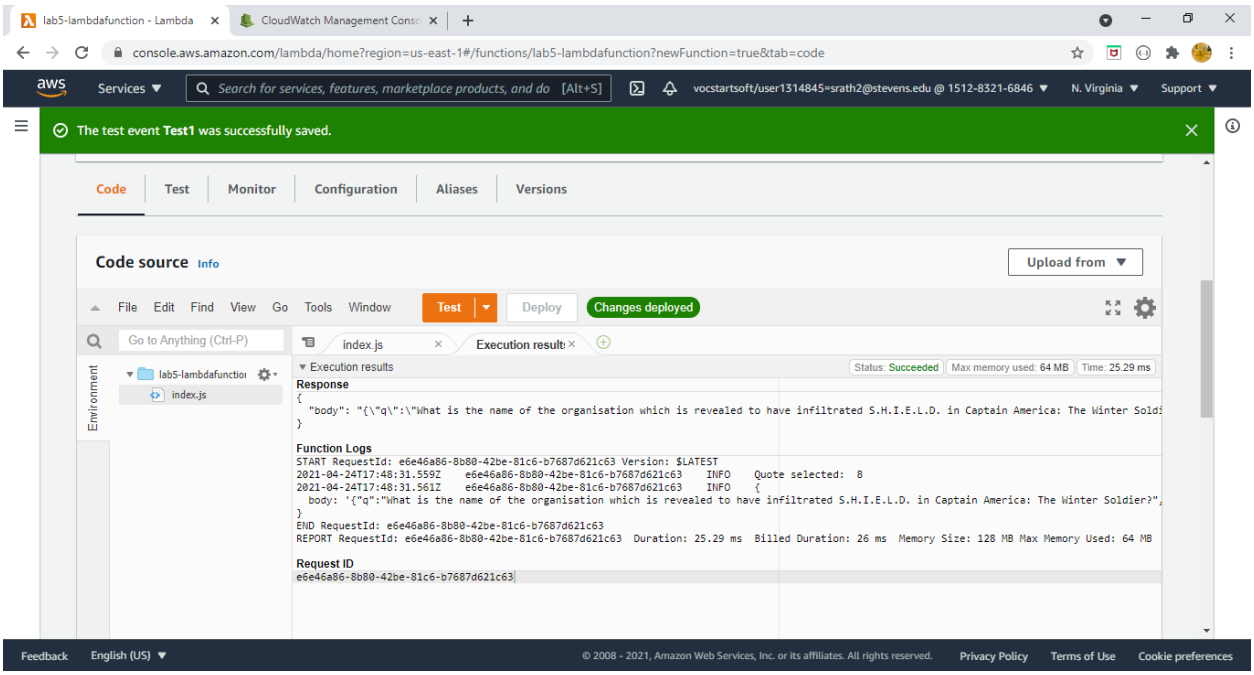
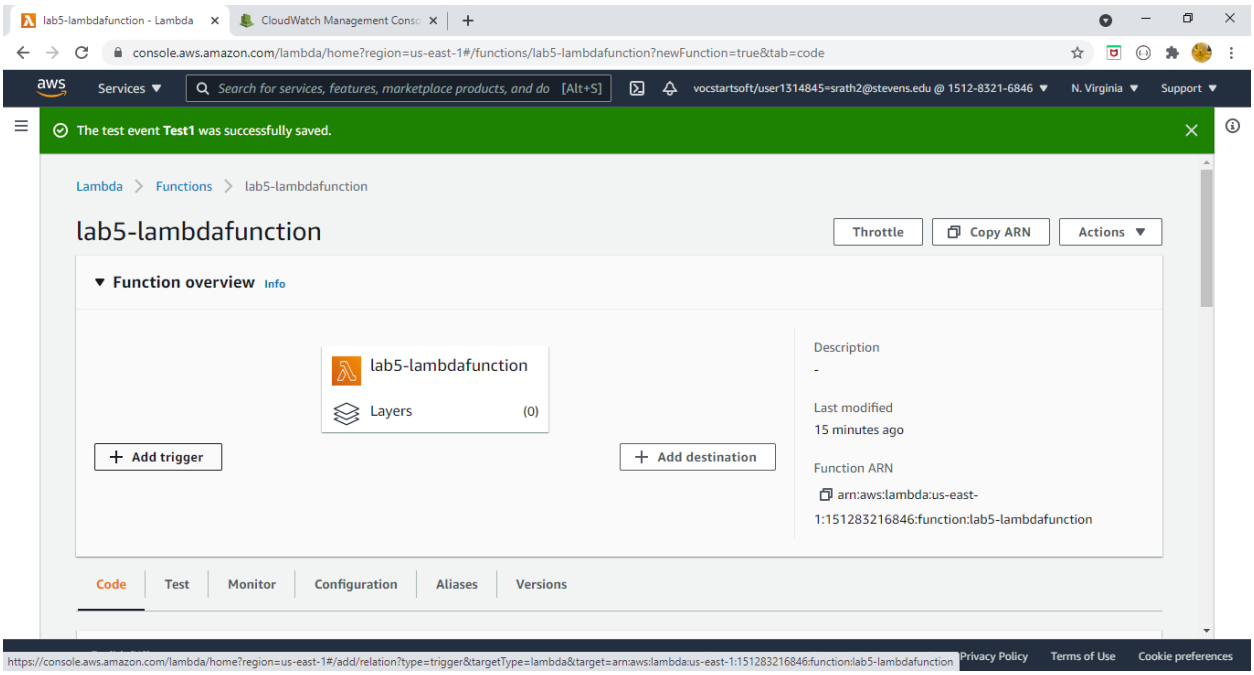
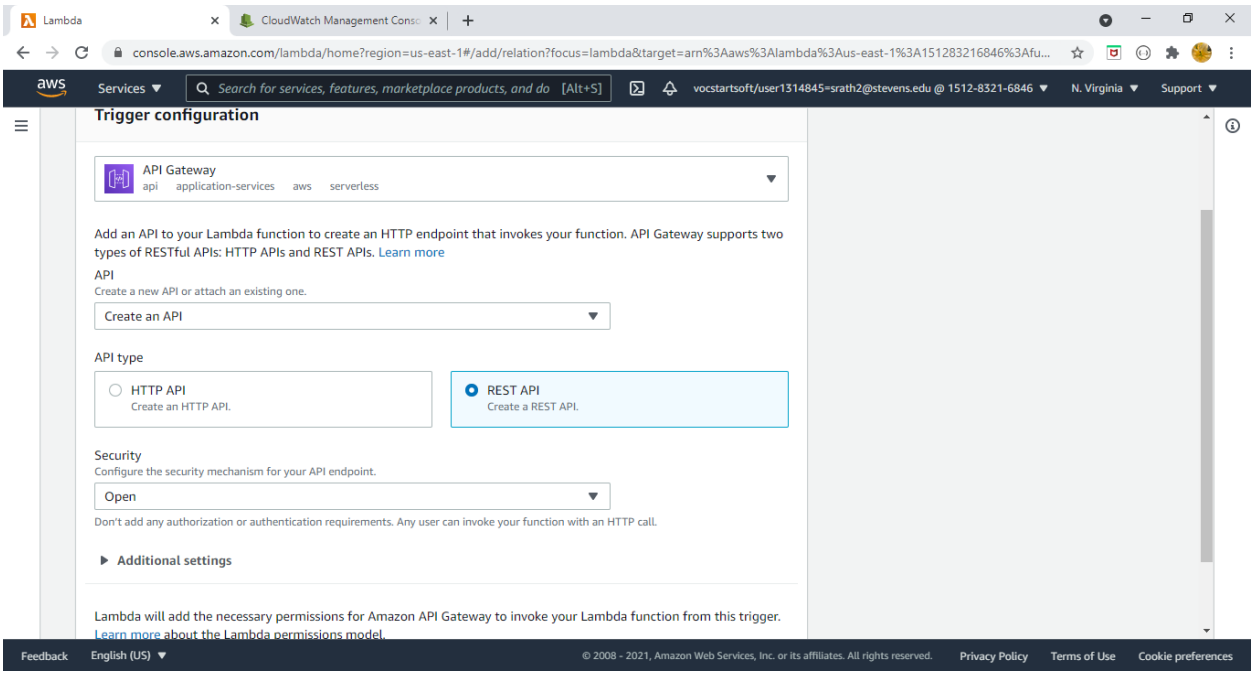
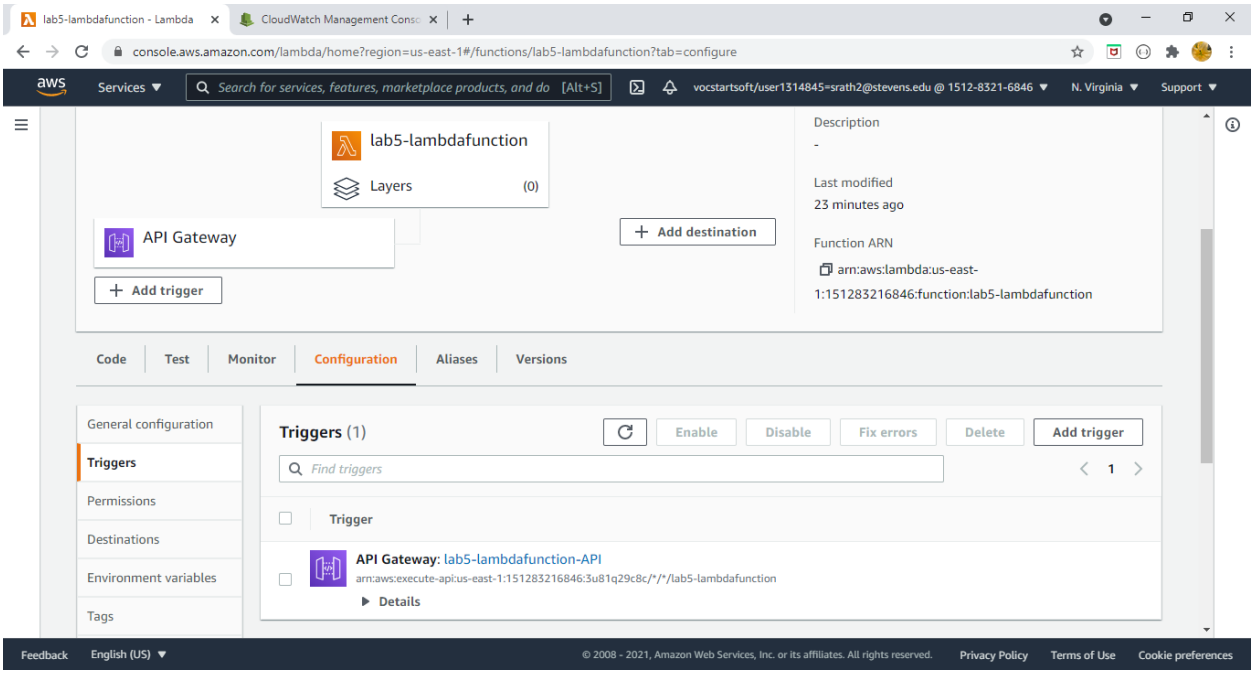


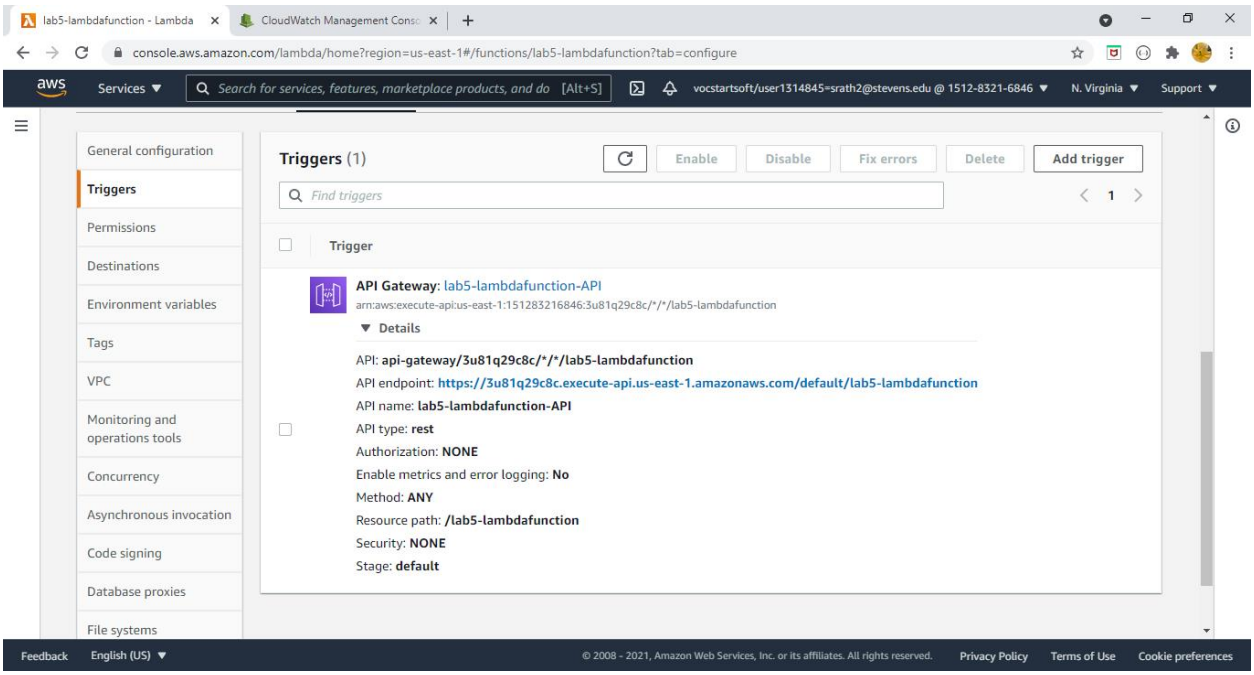
By clicking on add trigger I added the rest api to invoke the lambda function.



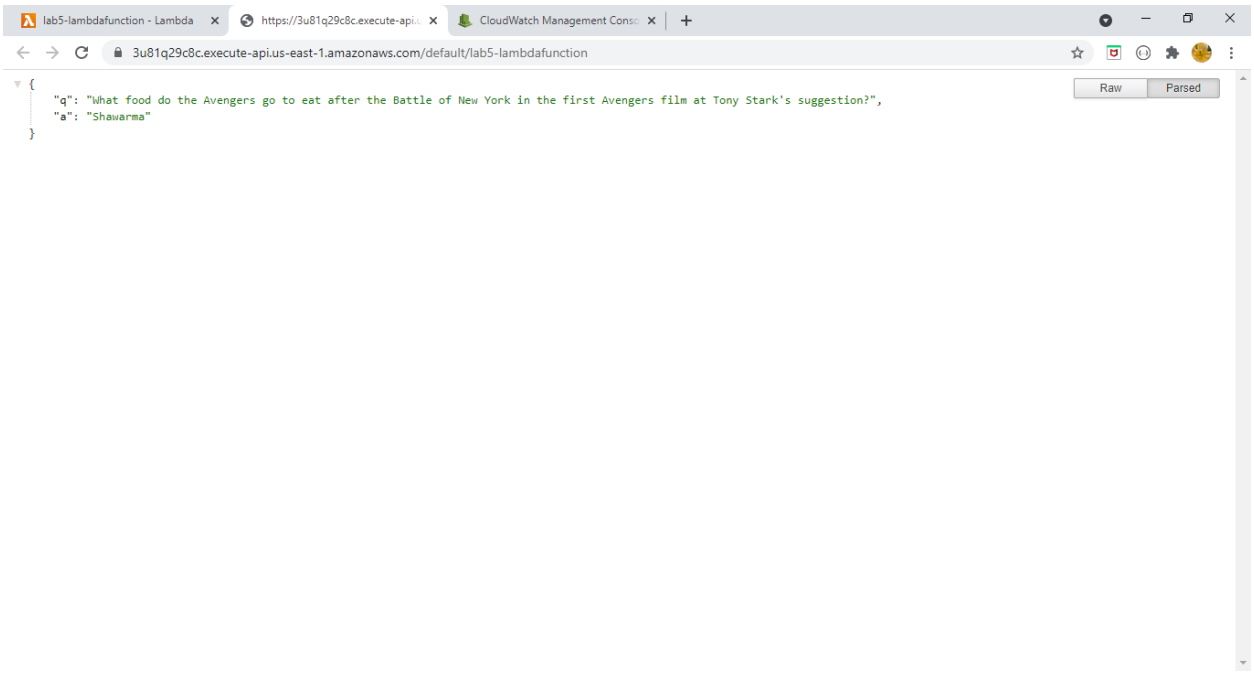


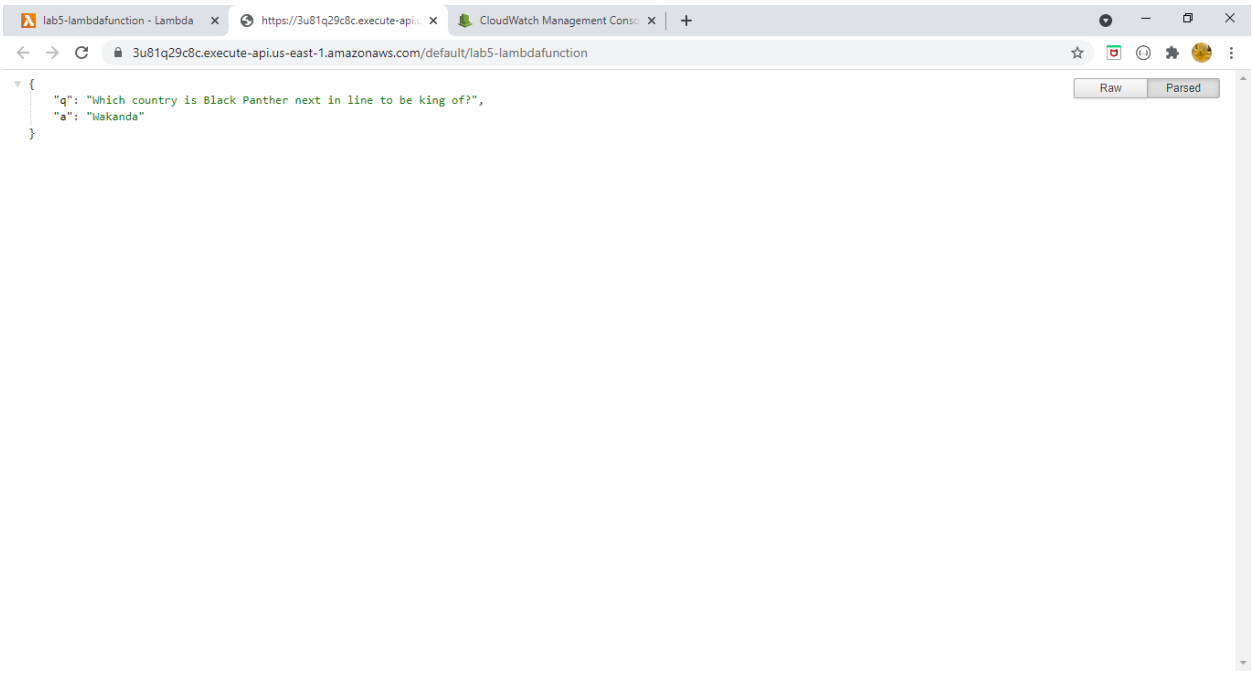
Once API gateway is added, we can invoke the lambda function by going to the end point url.



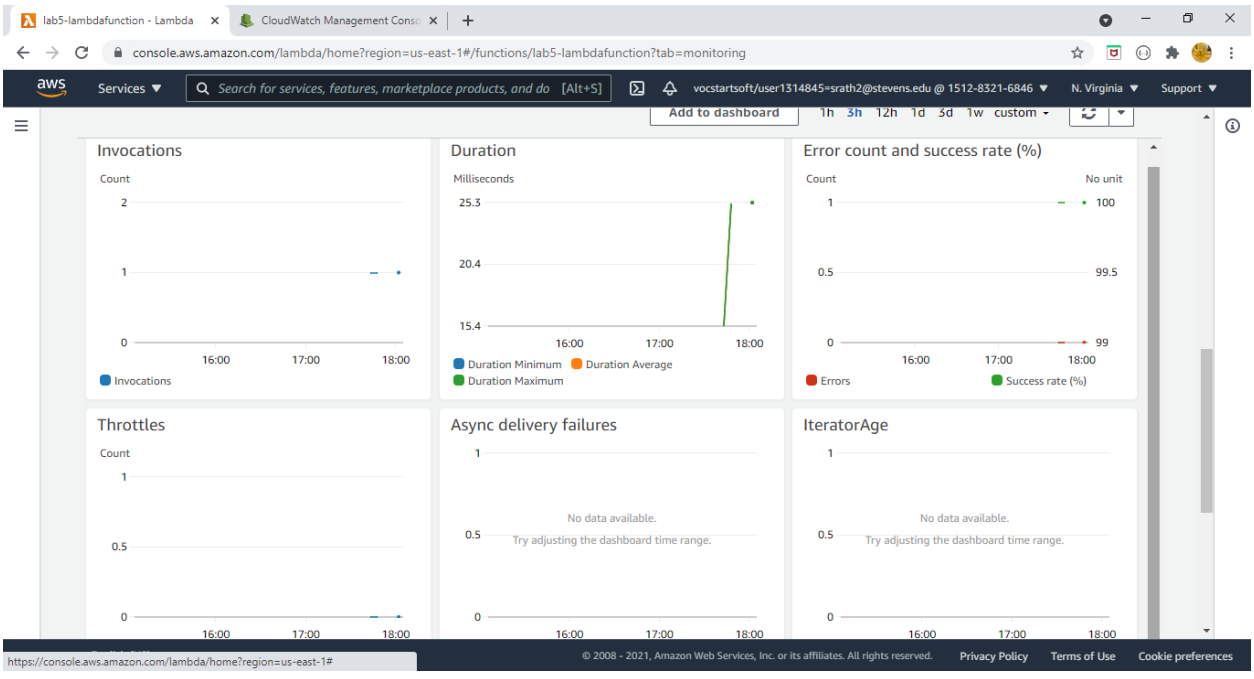


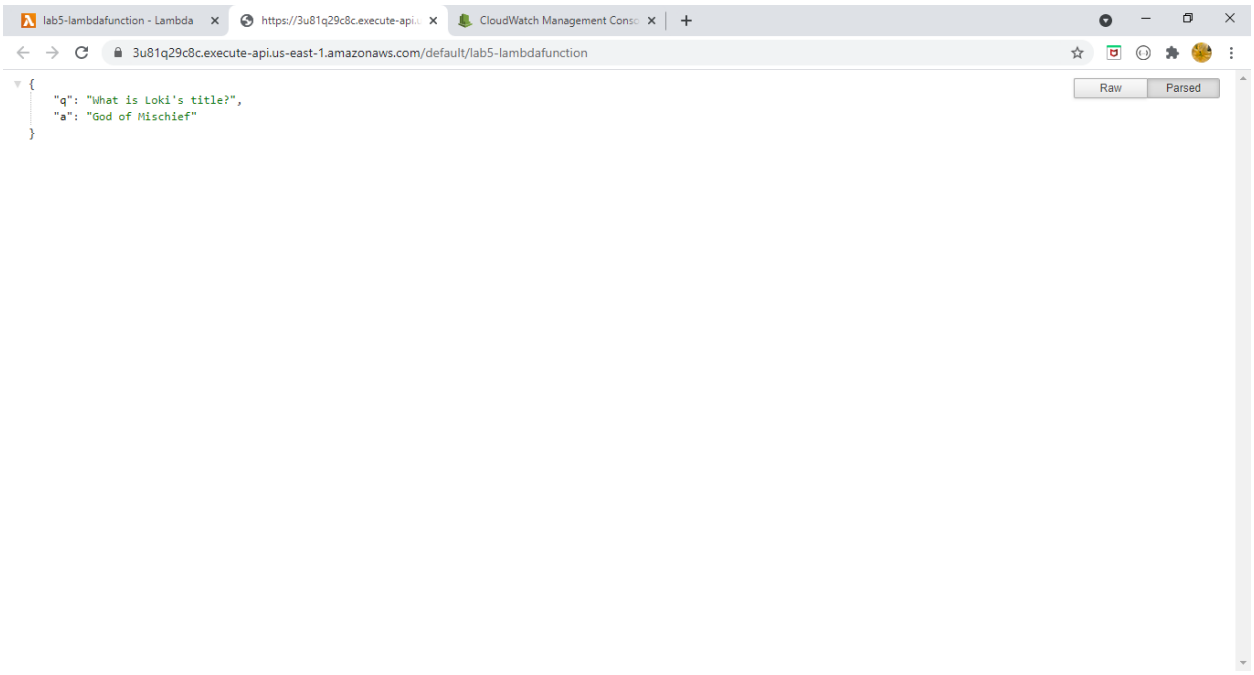
It displays random question on every invoked request.

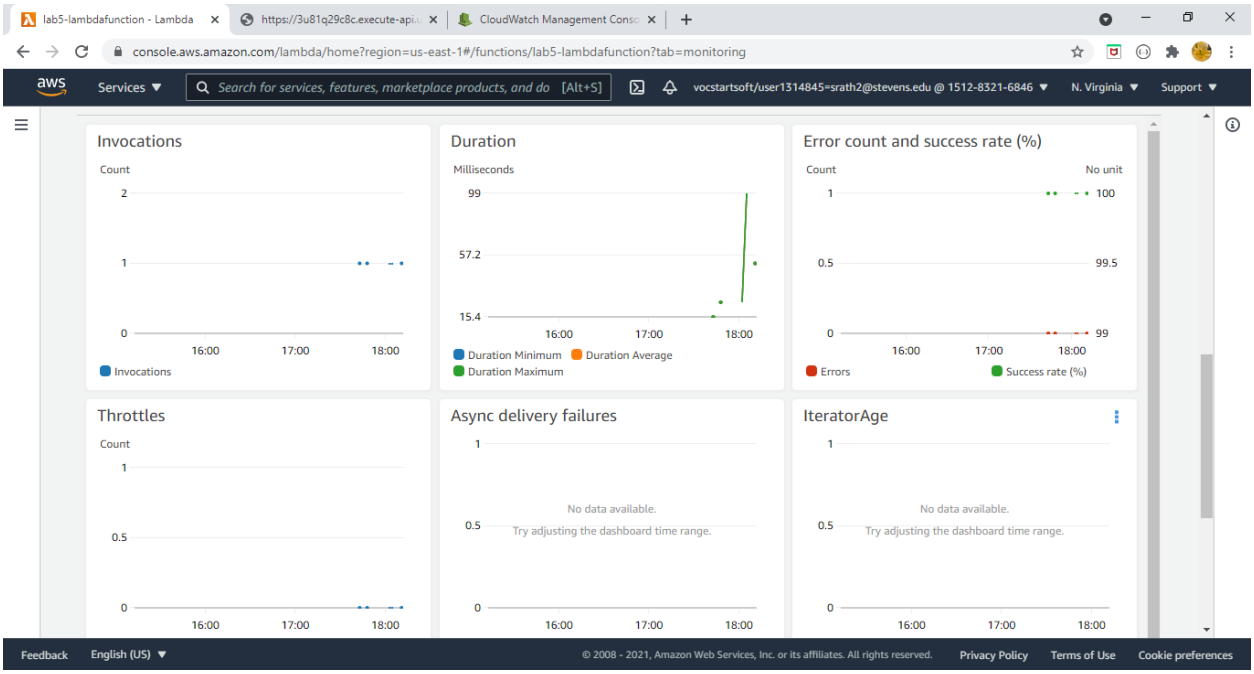




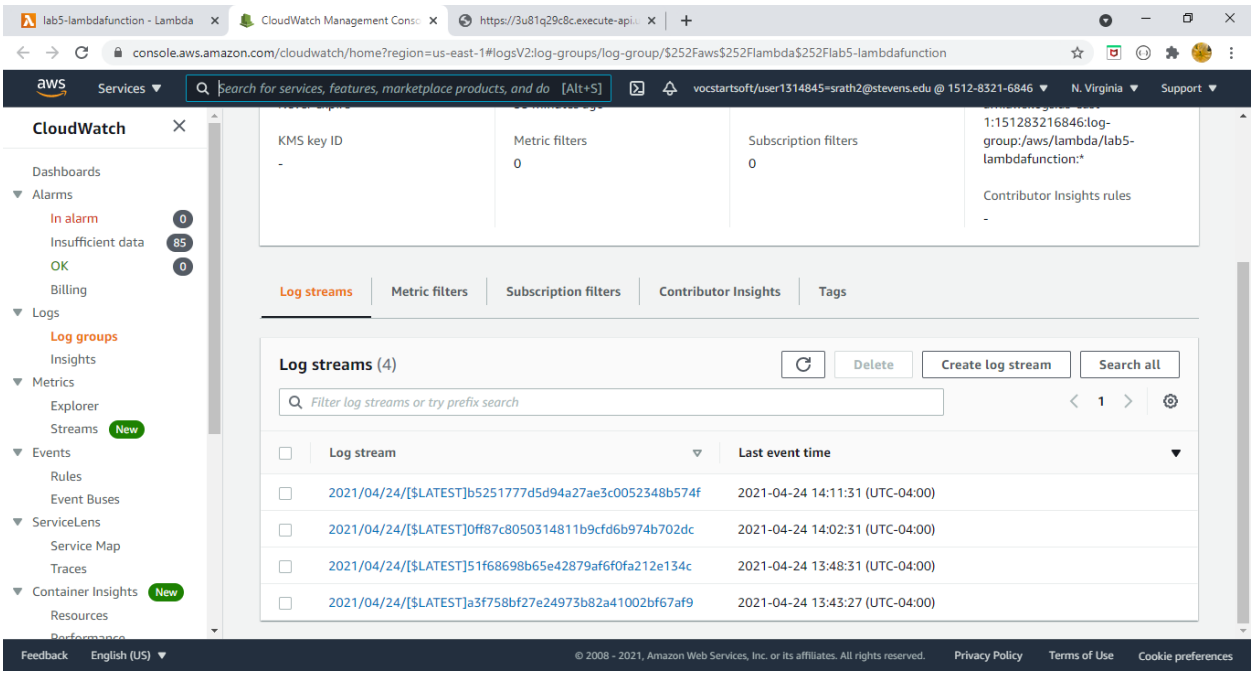
Under monitor tab I can see the different logs for invocations, duration, error count and success rate.







Under logs in CloudWatch it will display the number of times the function is invoked with request time and ended time.


lab5-lambdafunction - Lambda
CloudWatch Management Consc
https://3u81q29c8c.execute-api
console.aws.amazon.com/cloudwatch/home?region=us-east-1#logsV2:log-groups/log-group/$252Faws$252Flambda$252Flab5-lambdafunction
Services
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vocstartsoft/user1314845=srath2@stevens.edu @ 1512-8321-6846
N. Virginia
Support
CloudWatch
Dashboards
Alarms
In alarm 0
Insufficient data 85
OK 0
Billing
Logs
Log groups
Insights
Metrics
Explorer
Streams New
Events
Rules
Event Buses
ServiceLens
Service Map
Traces
Container Insights New
Resources
KMS key ID
-
Metric filters
0
Subscription filters
0
1:151283216846:log-group:/aws/lambda/lab5-lambdafunction:*
Contributor Insights rules
-
Log streams
Metric filters
Subscription filters
Contributor Insights
Tags
Log streams (4)
Delete
Create log stream
Search all
Filter log streams or try prefix search
1
Log stream
Last event time
2021/04/24/[$LATEST]b5251777d5d94a27ae3c0052348b574f
2021-04-24 14:11:31 (UTC-04:00)
2021/04/24/[$LATEST]0ff87c8050314811b9cfd6b974b702dc
2021-04-24 14:02:31 (UTC-04:00)
2021/04/24/[$LATEST]51f68698b65e42879af6f0fa212e134c
2021-04-24 13:48:31 (UTC-04:00)
2021/04/24/[$LATEST]a3f758bf27e24973b82a41002bf67af9
2021-04-24 13:43:27 (UTC-04:00)
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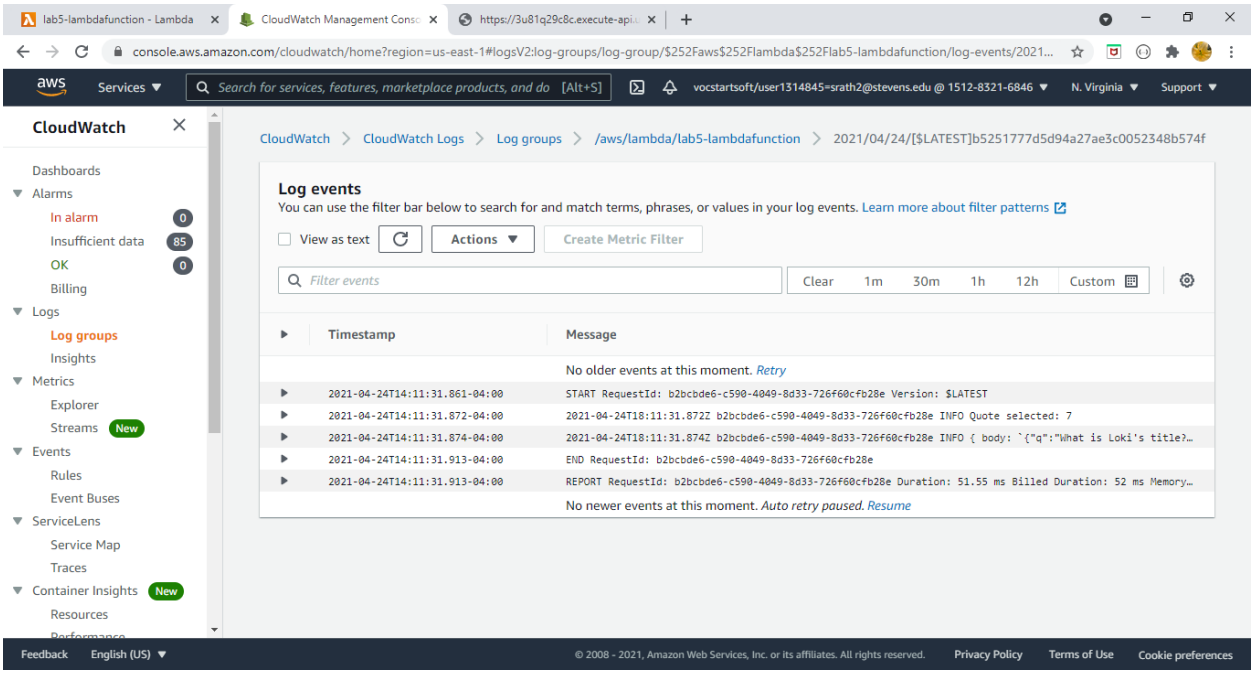
lab5-lambdafunction - Lambda
CloudWatch Management Consc
https://3u81q29c8c.execute-api
console.aws.amazon.com/cloudwatch/home?region=us-east-1#logsV2:log-groups/log-group/$252Faws$252Flambda$252Flab5-lambdafunction/log-events/2021...
Services
Search for services, features, marketplace products, and do [Alt+S]
vocstartsoft/user1314845=srath2@stevens.edu @ 1512-8321-6846
N. Virginia
Support
CloudWatch
Dashboards
Alarms
In alarm 0
Insufficient data 85
OK 0
Billing
Logs
Log groups
Insights
Metrics
Explorer
Streams New
Events
Rules
Event Buses
ServiceLens
Service Map
Traces
Container Insights New
Resources
CloudWatch > CloudWatch Logs > Log groups > /aws/lambda/lab5-lambdafunction > 2021/04/24/[$LATEST]b5251777d5d94a27ae3c0052348b574f
Log events
You can use the filter bar below to search for and match terms, phrases, or values in your log events. Learn more about filter patterns
View as text
Actions
Create Metric Filter
Filter events
Clear
1m
30m
1h
12h
Custom
Timestamp
Message
No older events at this moment. Retry
2021-04-24T14:11:31.861-04:00 START RequestId: b2bcbde6-c590-4049-8d33-726f60cfb28e Version: $LATEST
2021-04-24T14:11:31.872-04:00 2021-04-24T18:11:31.872Z b2bcbde6-c590-4049-8d33-726f60cfb28e INFO Quote selected: 7
2021-04-24T14:11:31.874-04:00 2021-04-24T18:11:31.874Z b2bcbde6-c590-4049-8d33-726f60cfb28e INFO { body: `{"q":"What is Loki's title?...
2021-04-24T14:11:31.913-04:00 END RequestId: b2bcbde6-c590-4049-8d33-726f60cfb28e
2021-04-24T14:11:31.913-04:00 REPORT RequestId: b2bcbde6-c590-4049-8d33-726f60cfb28e Duration: 51.55 ms Billed Duration: 52 ms Memory...
No newer events at this moment. Auto retry paused. Resume
Feedback
English (US)
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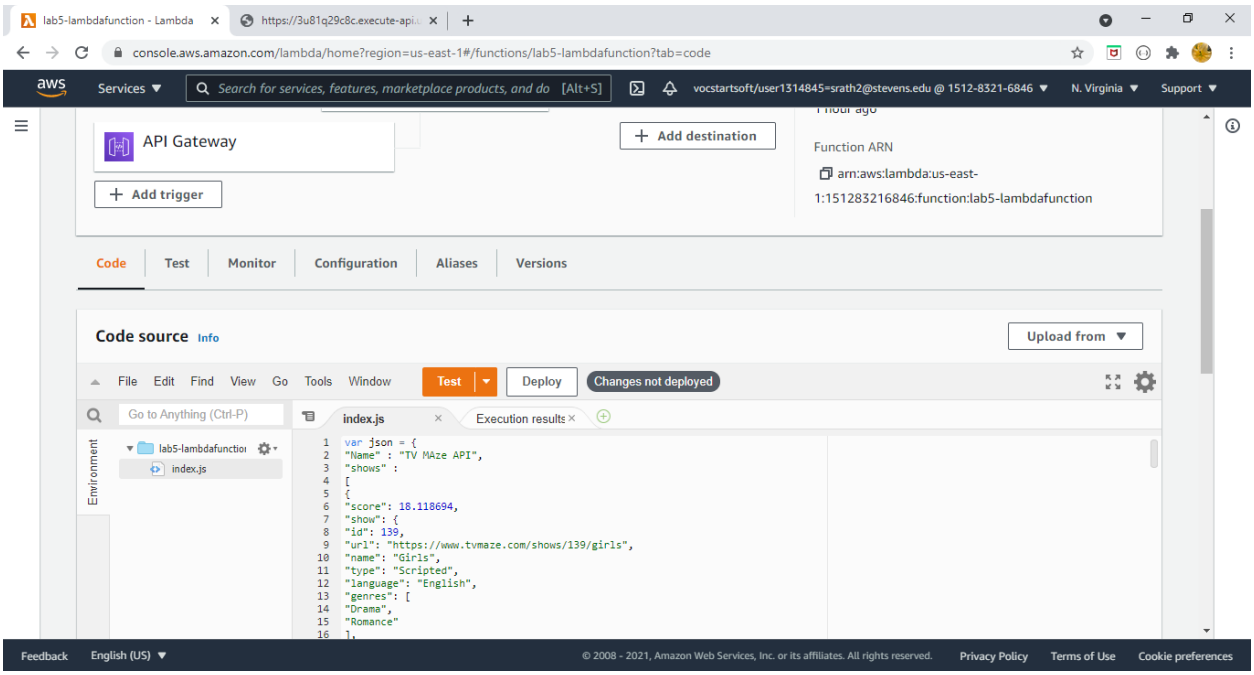
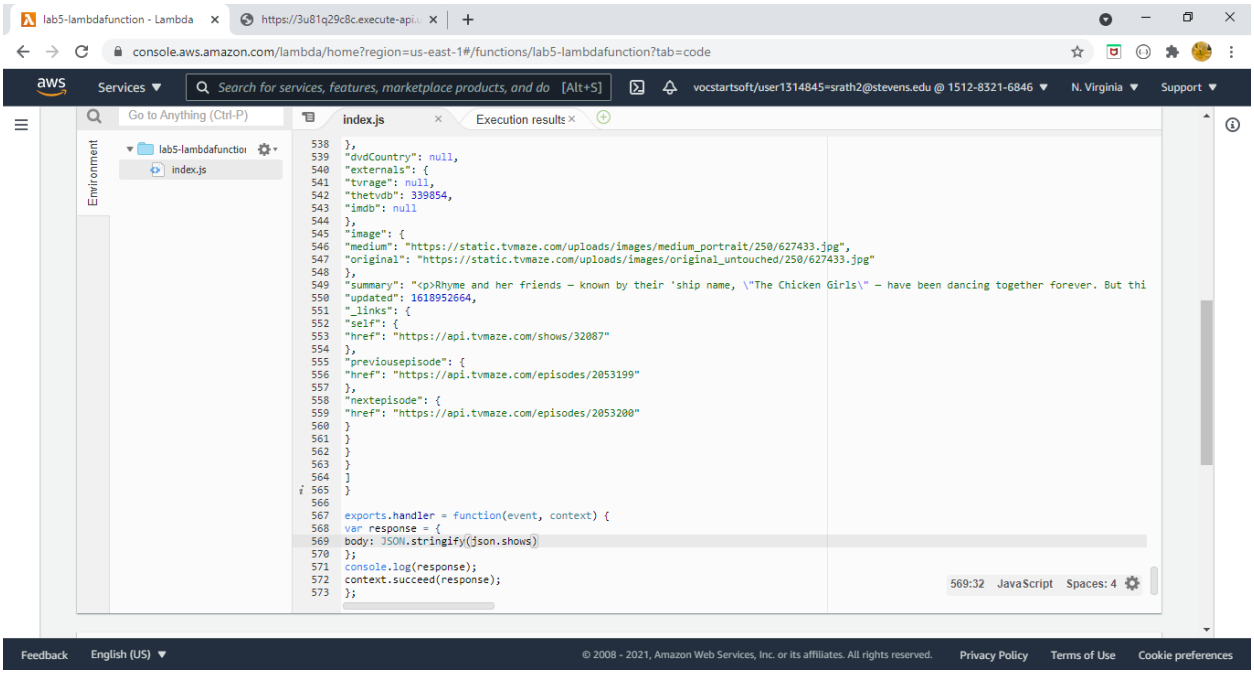
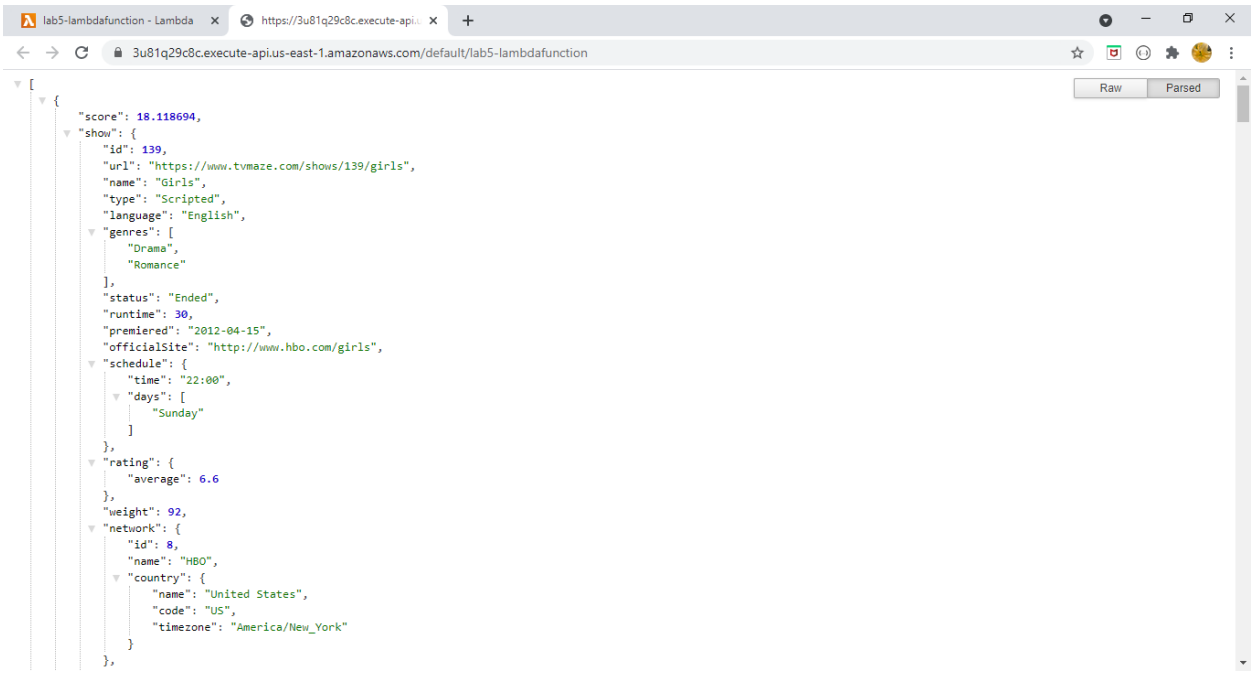
Cookie preferences

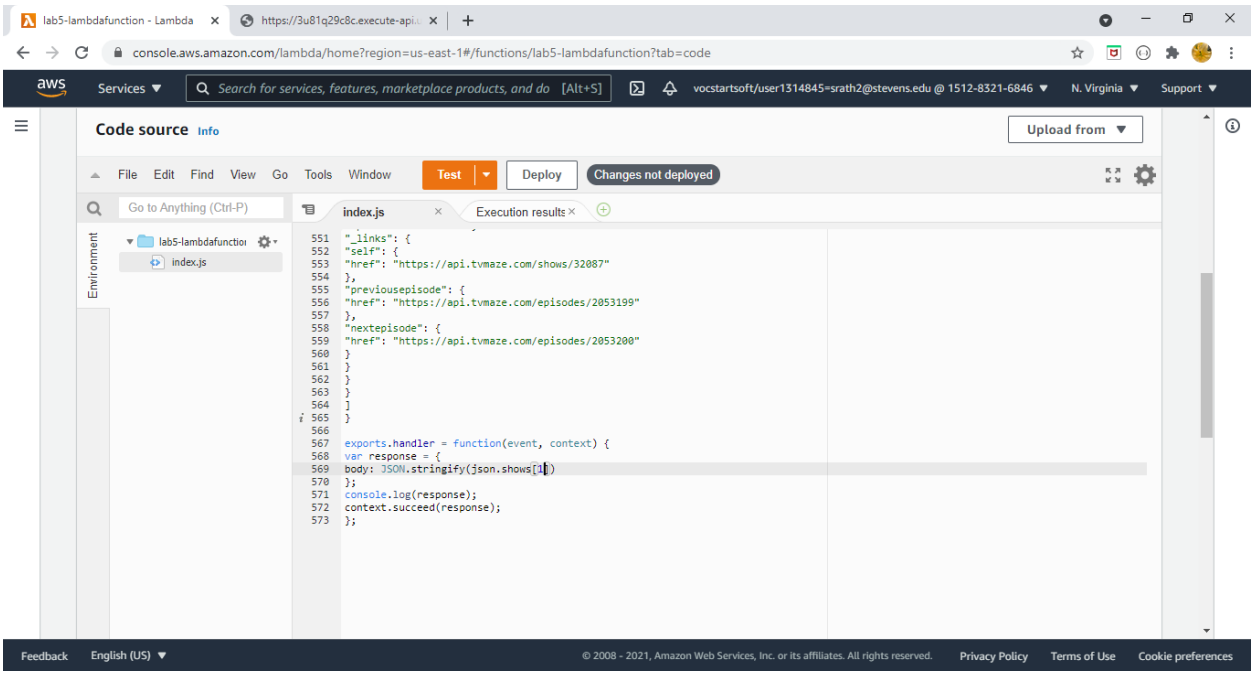


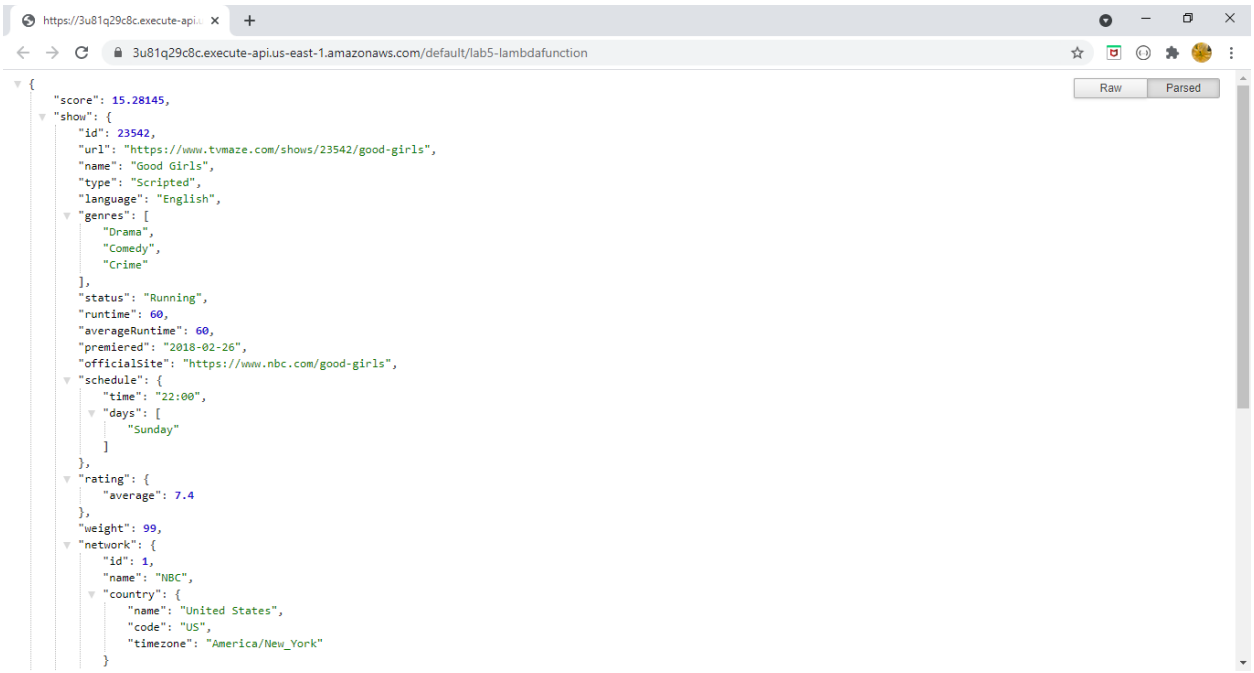
I made changes in code source to make a TV maze api, so that I can invoke with rest api endpoint url and can use it for my program to display all the shows

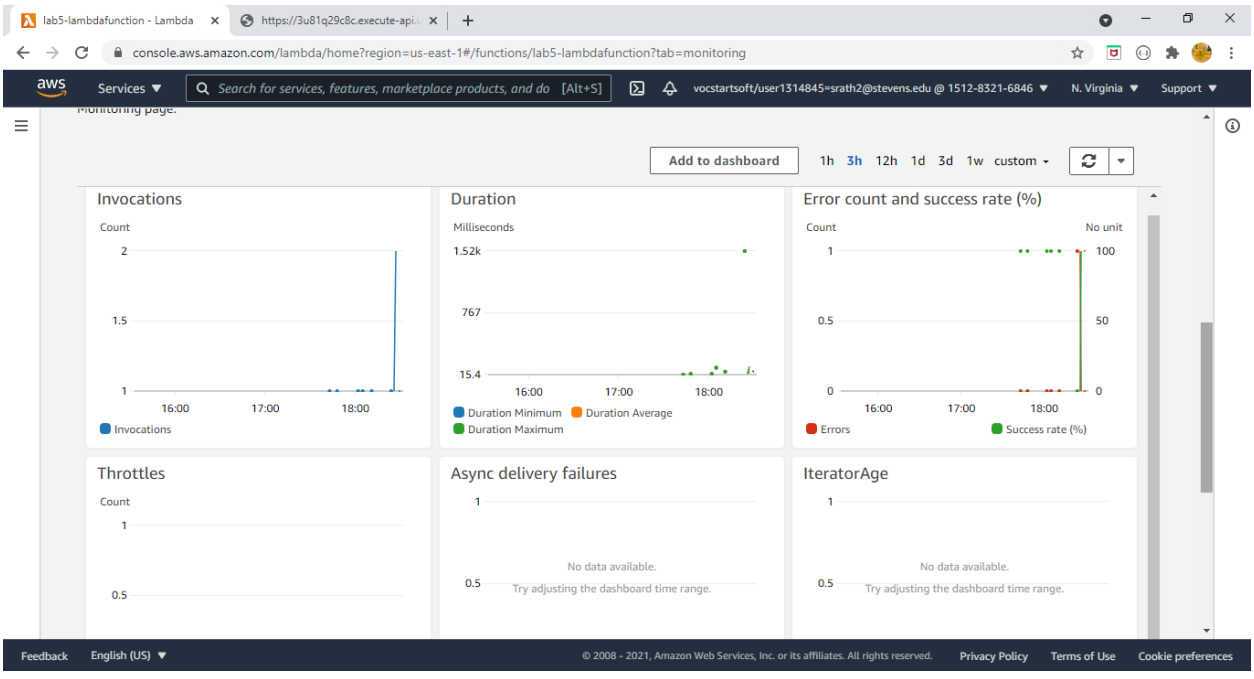




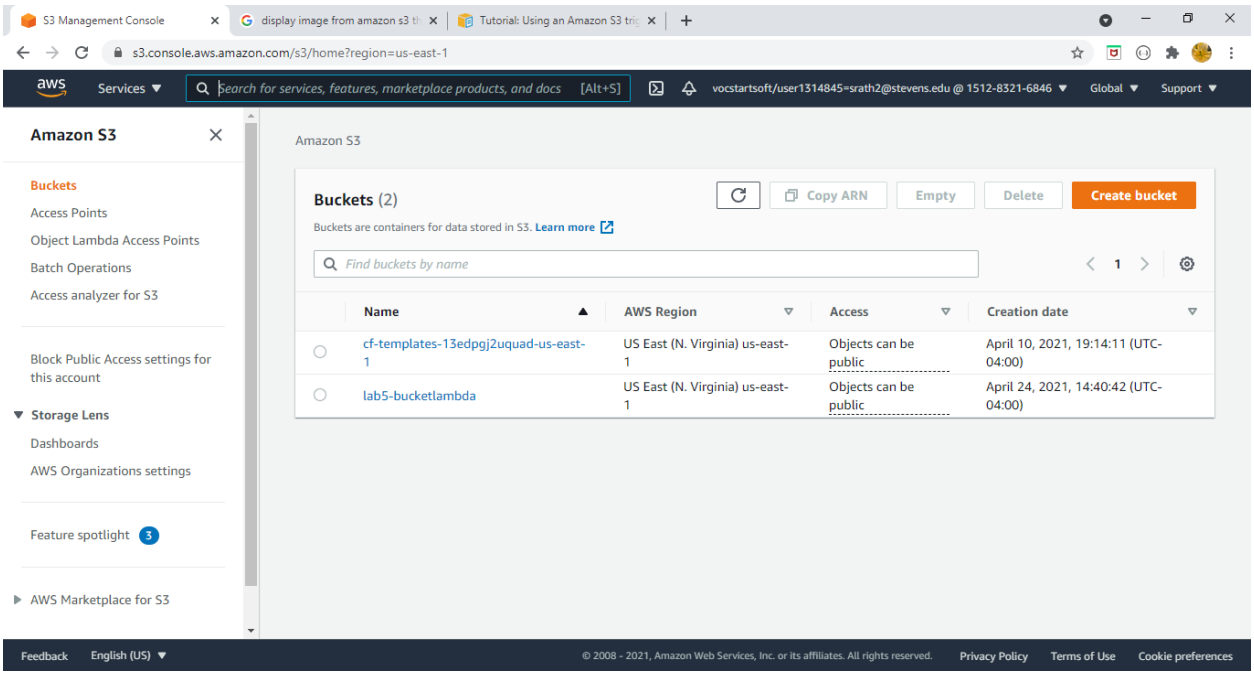
To display first show



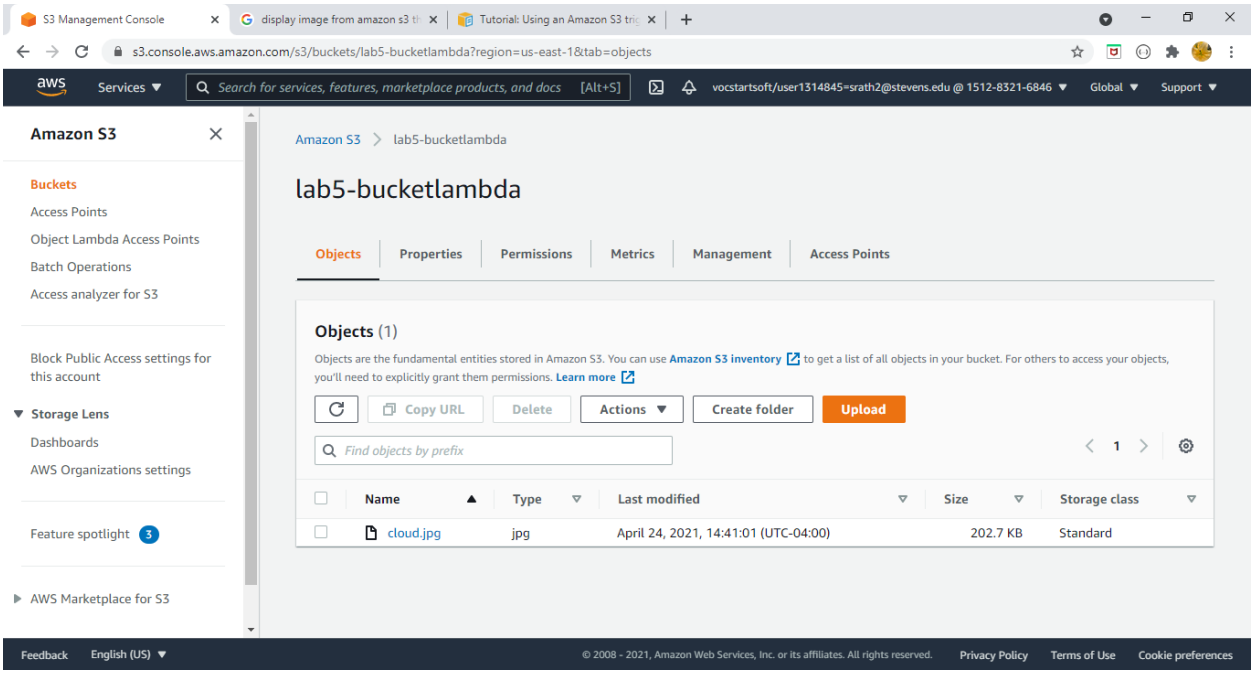




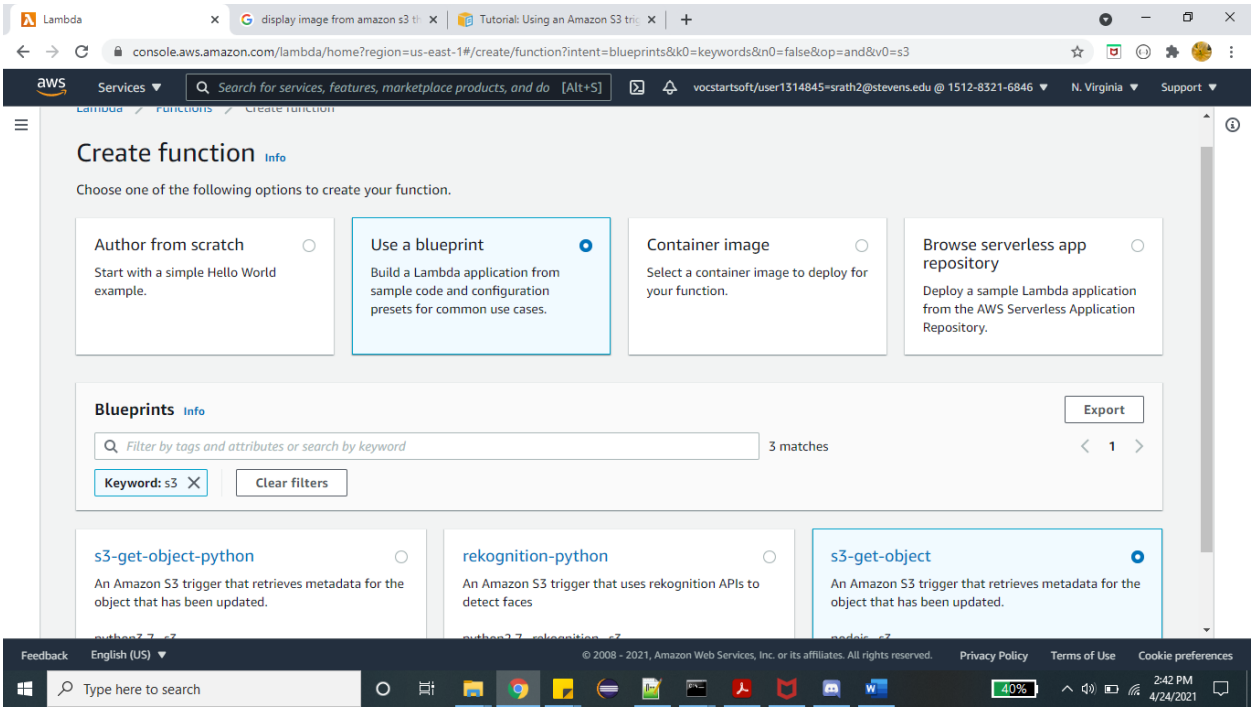
Now I am creating S3 bucket to attach it to lambda function. So that whenever I will upload some data in my s3 bucket, I can invoke the lambda function



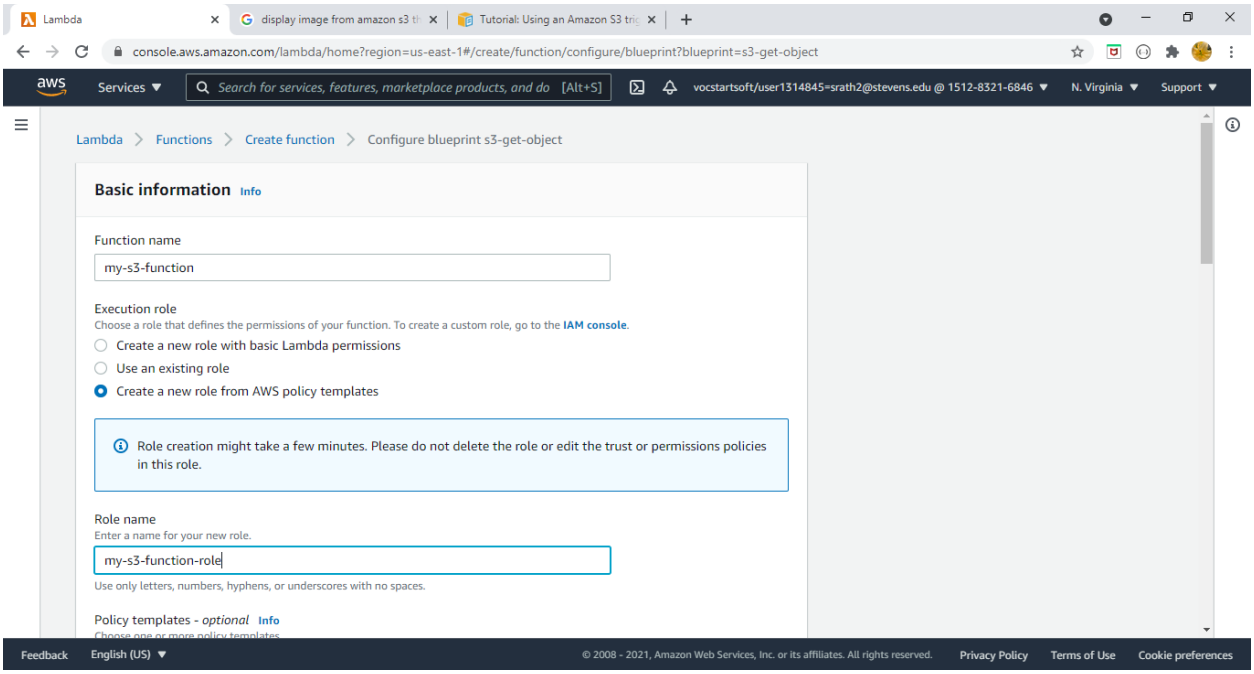
Uploaded image inside bucket



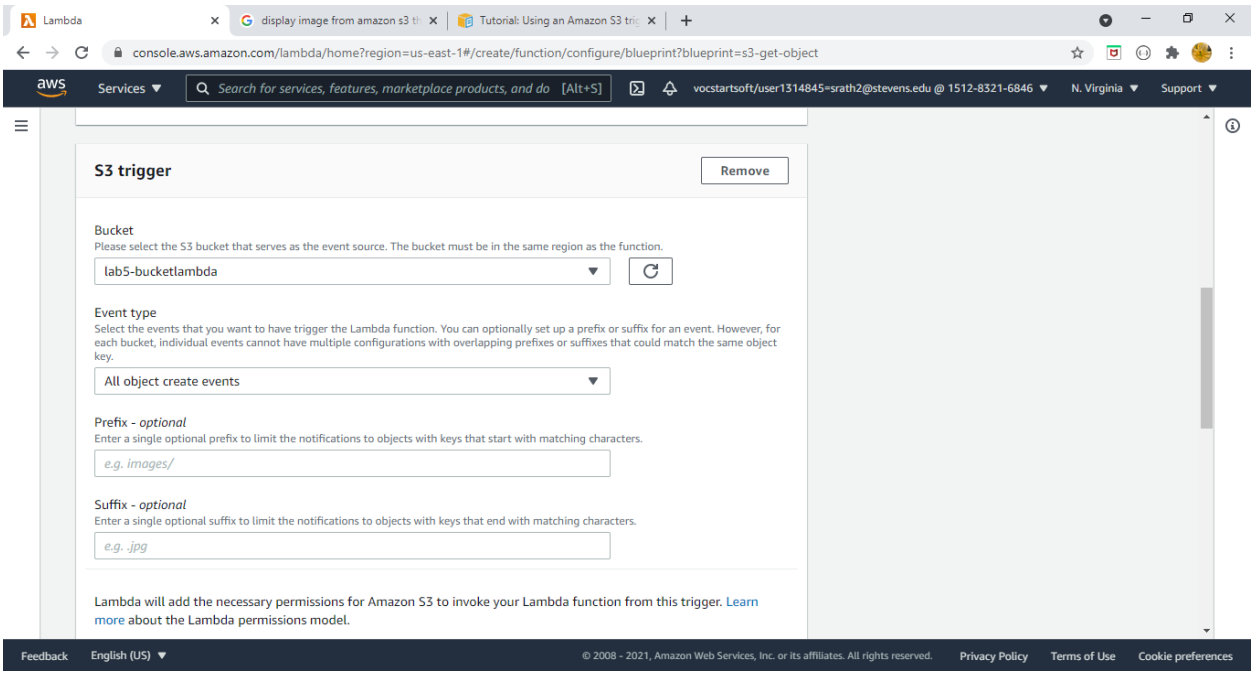
For creating a lambda function, we have to create the function by using a blueprint.



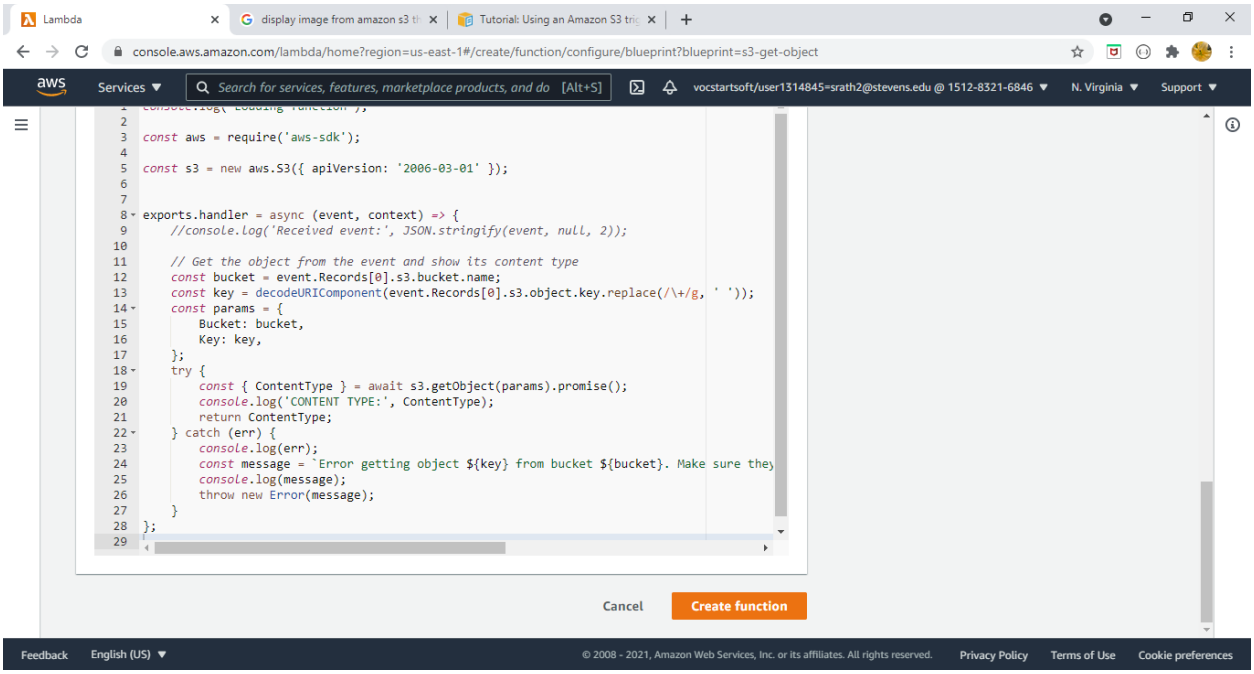
Under lambda function I have created a new role for AWS policy.



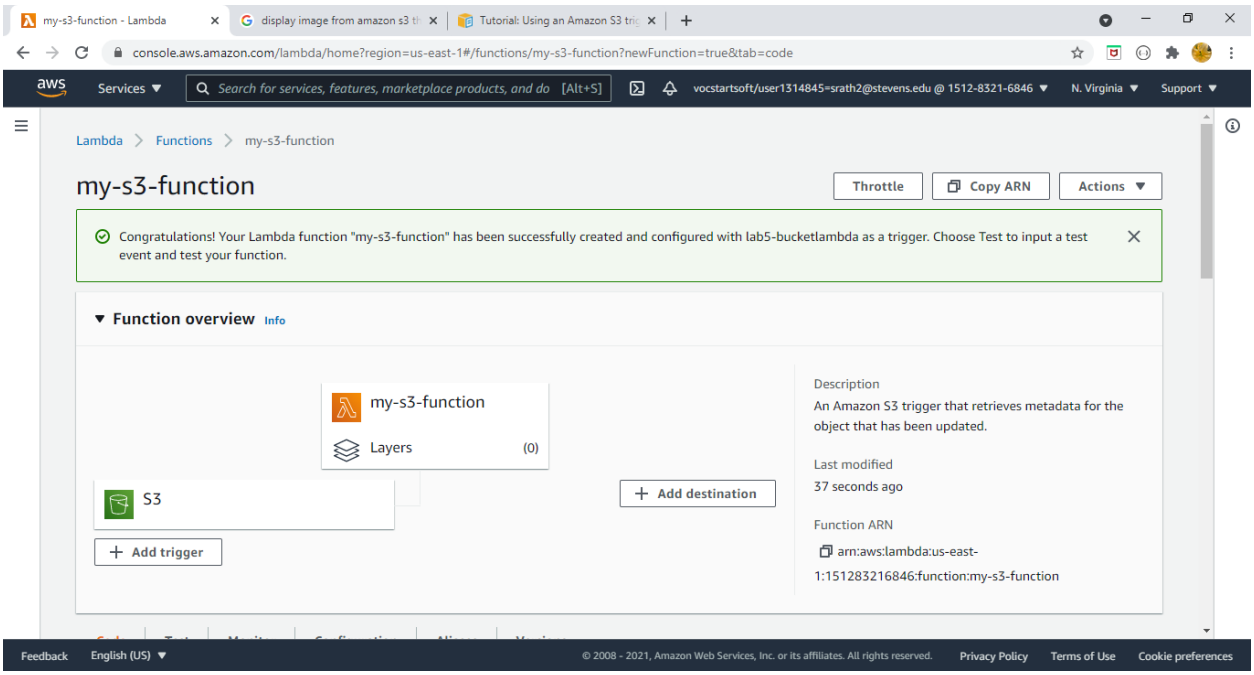
Under triggers, I have newly added S3 bucket



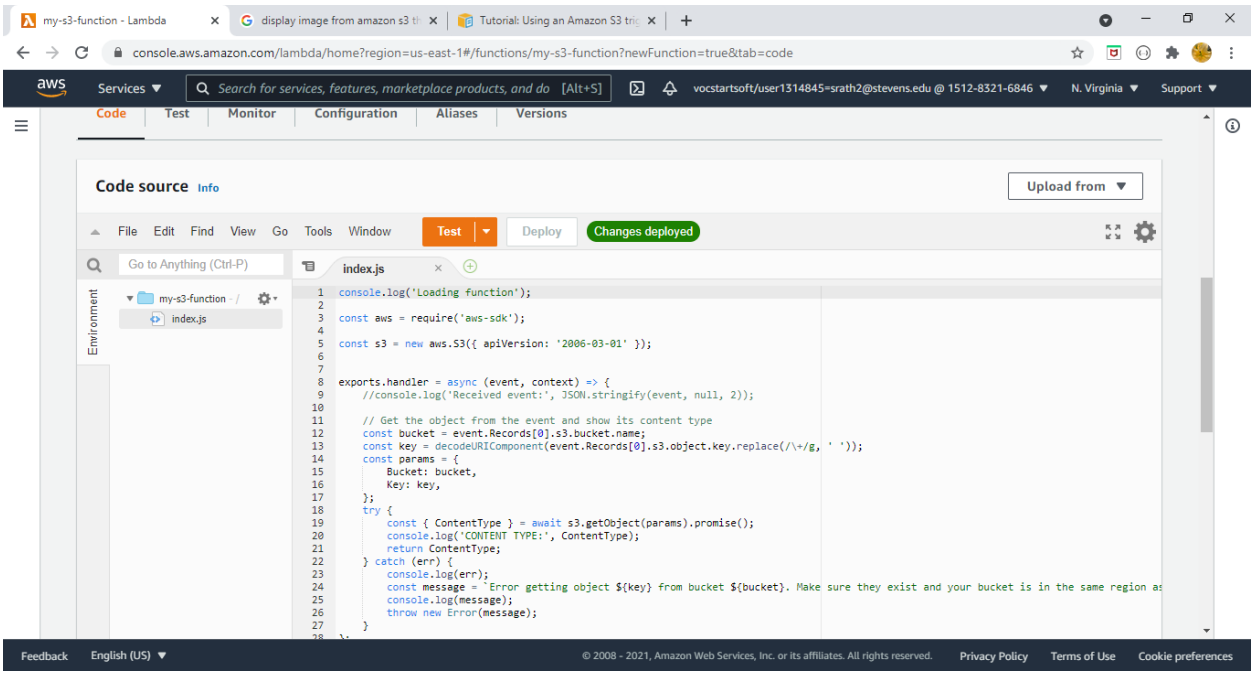
Then it will the code source before creation of lambda function.



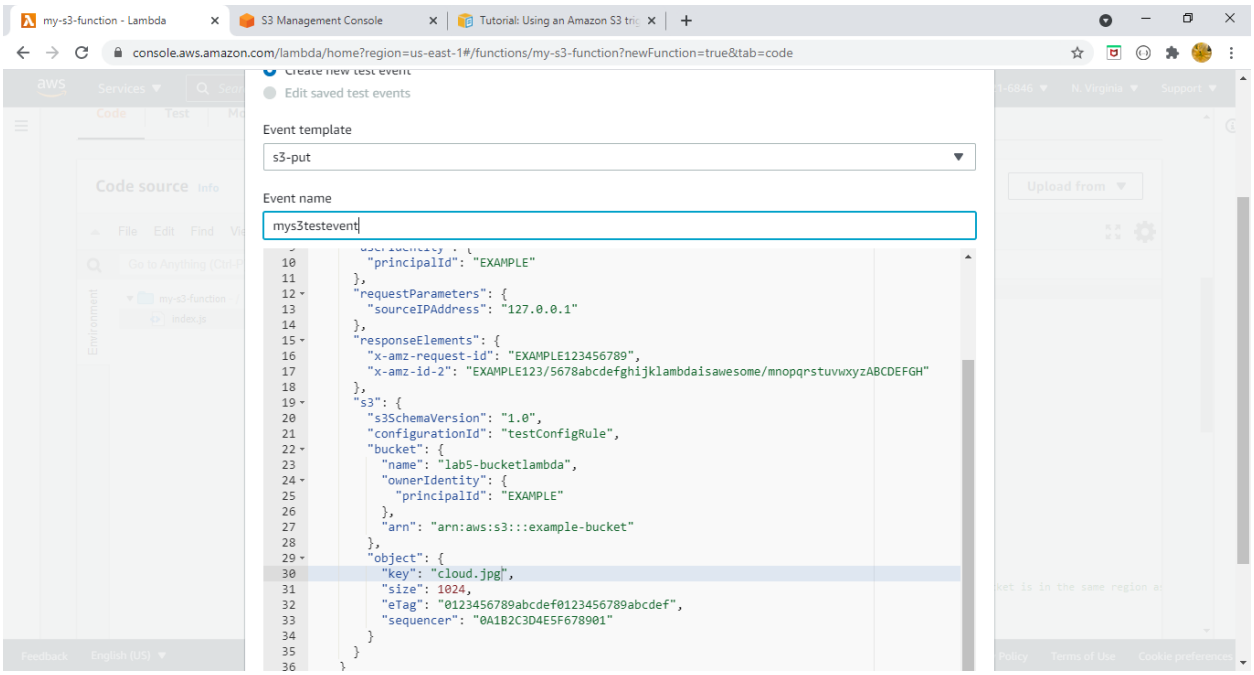
Lambda function created.



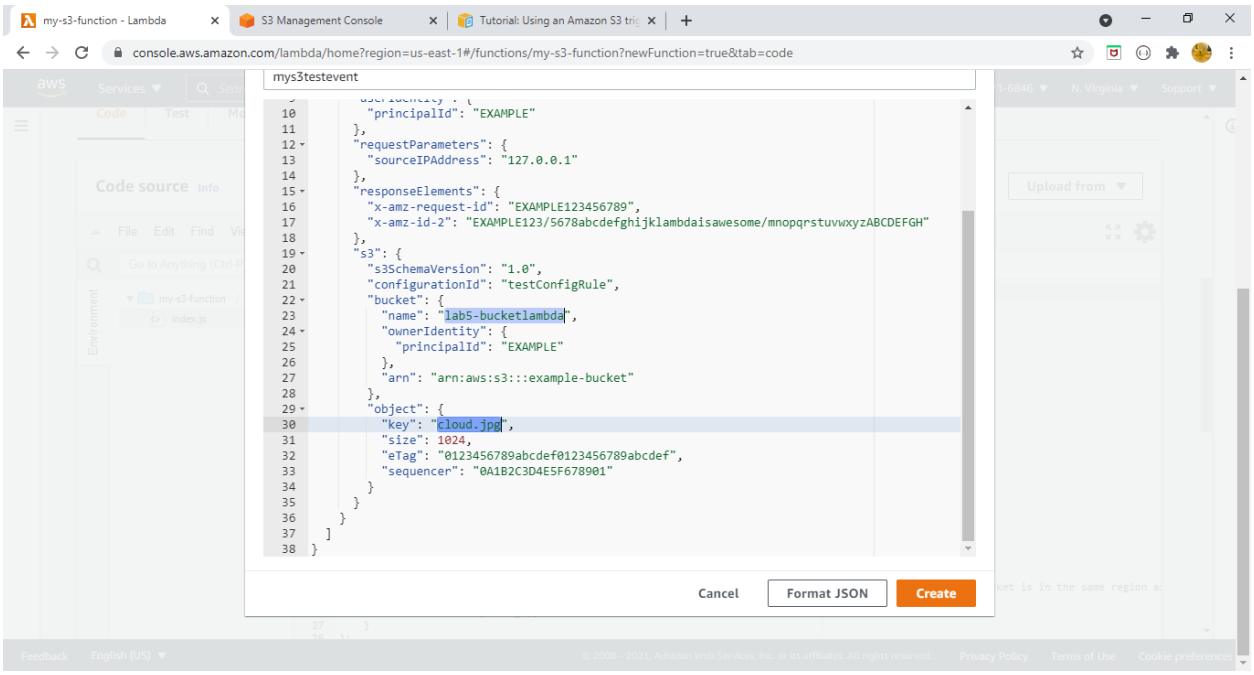
Checking the source code.



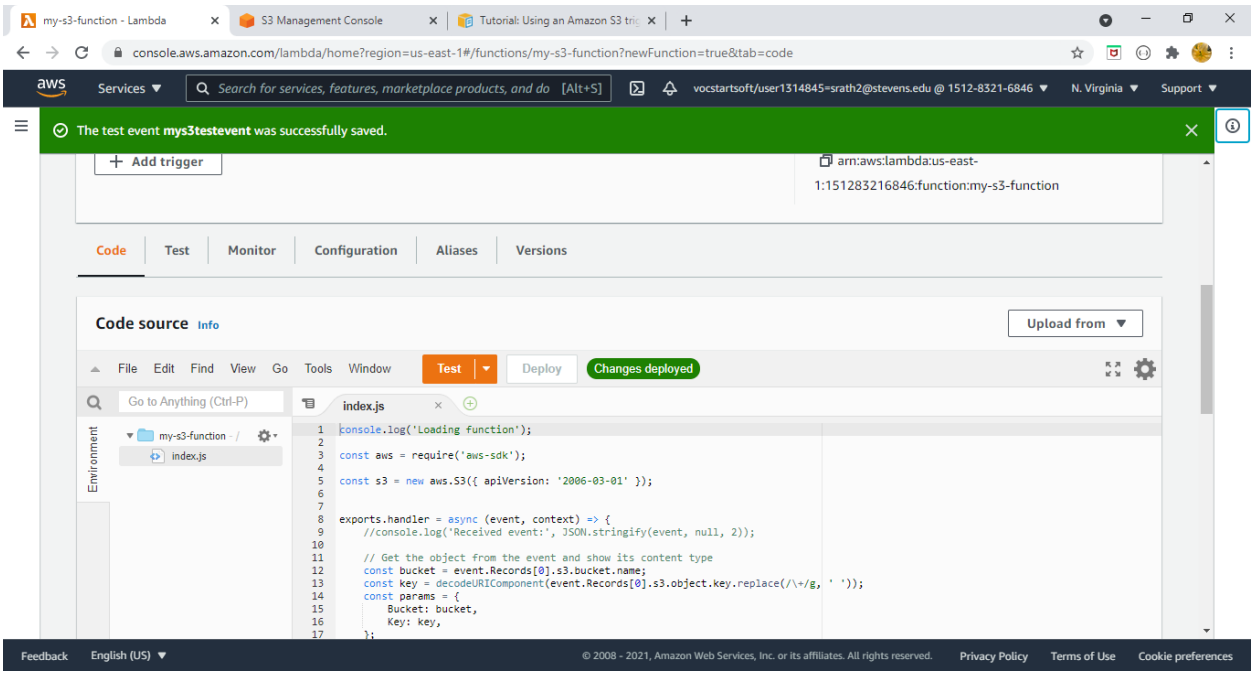
For invoking lambda function, where the event-template will be s3-put and provide a name.



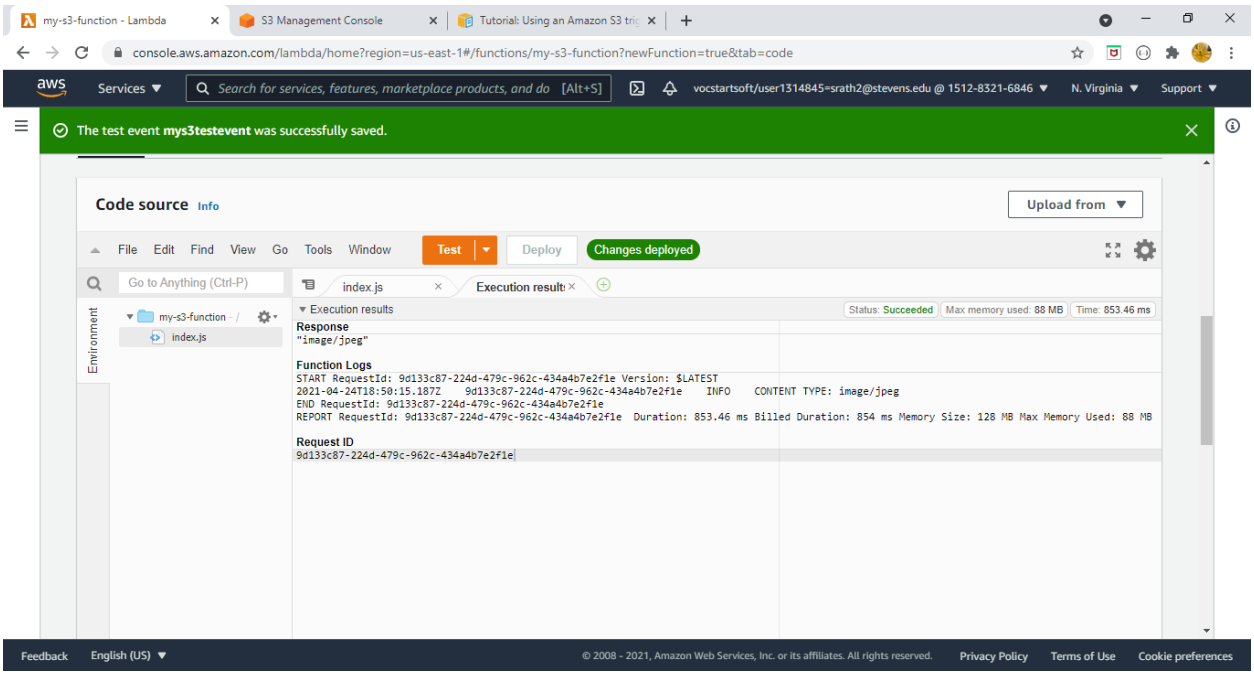
In the code source I have provided the S3 bucket name and key which is the uploaded image name “cloud.jpg”

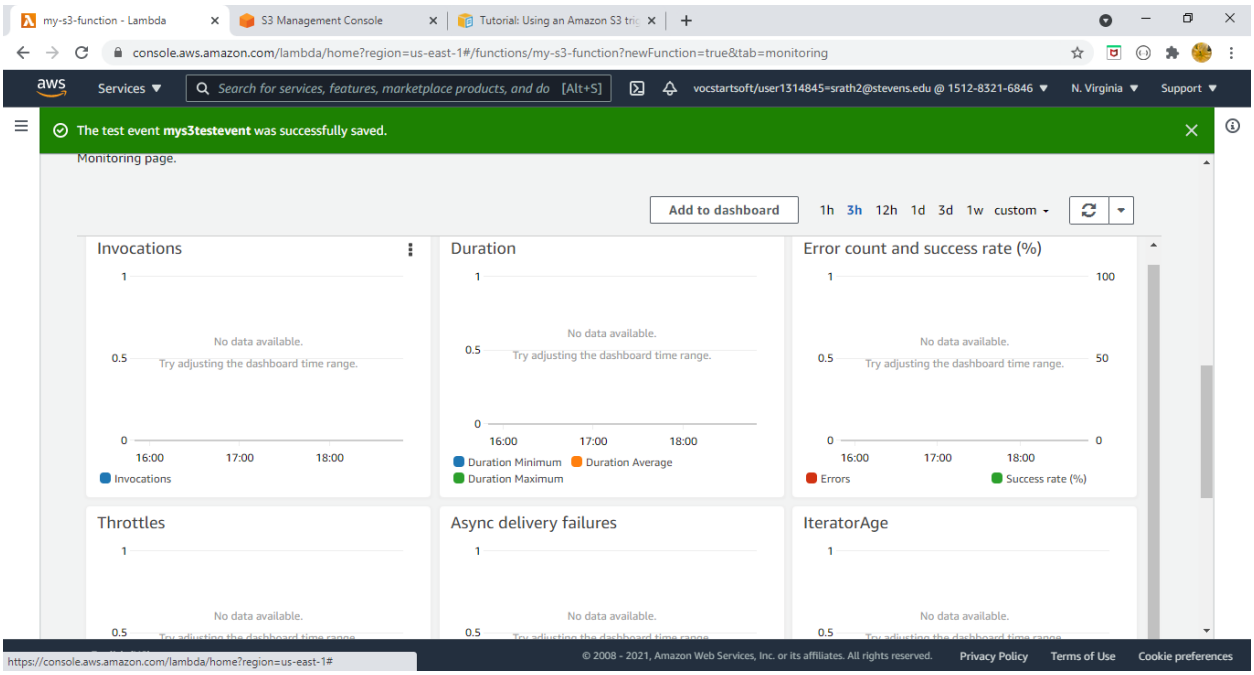


Changes are deployed.

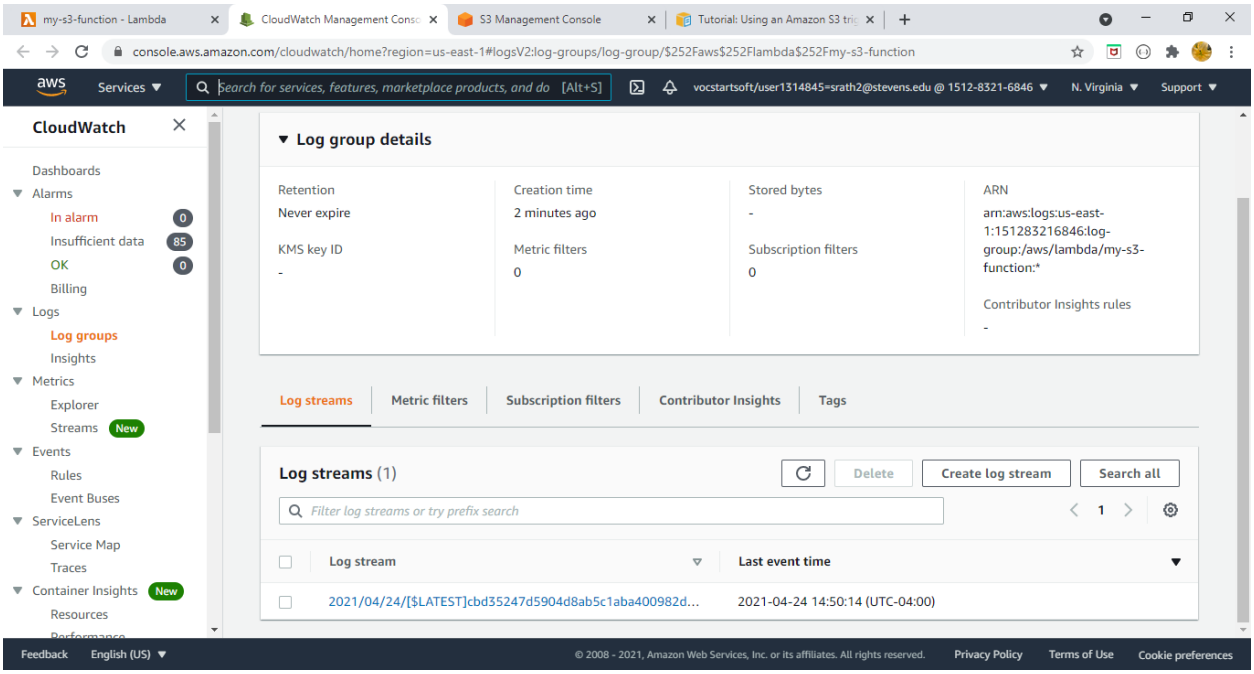


On clicking test, it will invoke the lambda function which will return success.

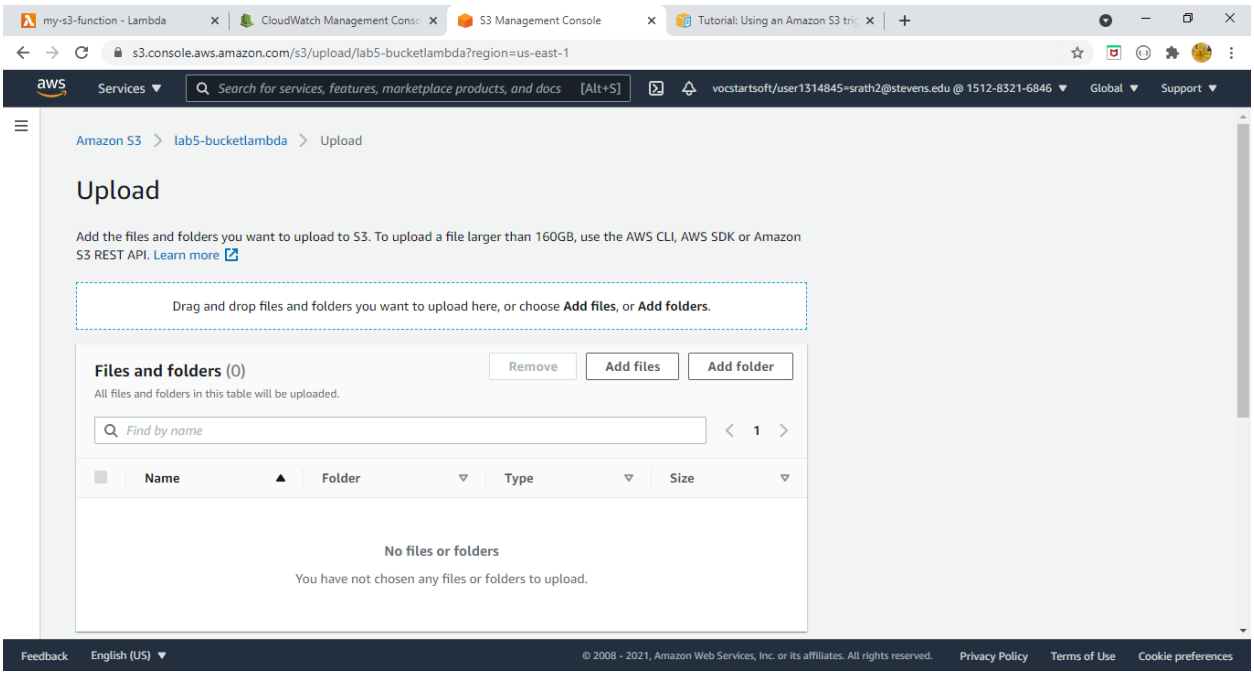




Log generated after invoking Lambda function.



Uploading the image in S3 bucket.


my-s3-function - Lambda
CloudWatch Management Conso
S3 Management Console
Tutorial: Using an Amazon S3 trig
s3.console.aws.amazon.com/s3/upload/lab5-bucketlambda?region=us-east-1
aws
Services
Search for services, features, marketplace products, and docs [Alt+S]
vocstartsoft/user1314845=srath2@stevens.edu @ 1512-8321-6846
Global
Support
Amazon S3 > lab5-bucketlambda > Upload
Upload
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.
Remove
Add files
Add folder
Find by name
1
Name
Folder
Type
Size
No files or folders
You have not chosen any files or folders to upload.
Feedback
English (US)
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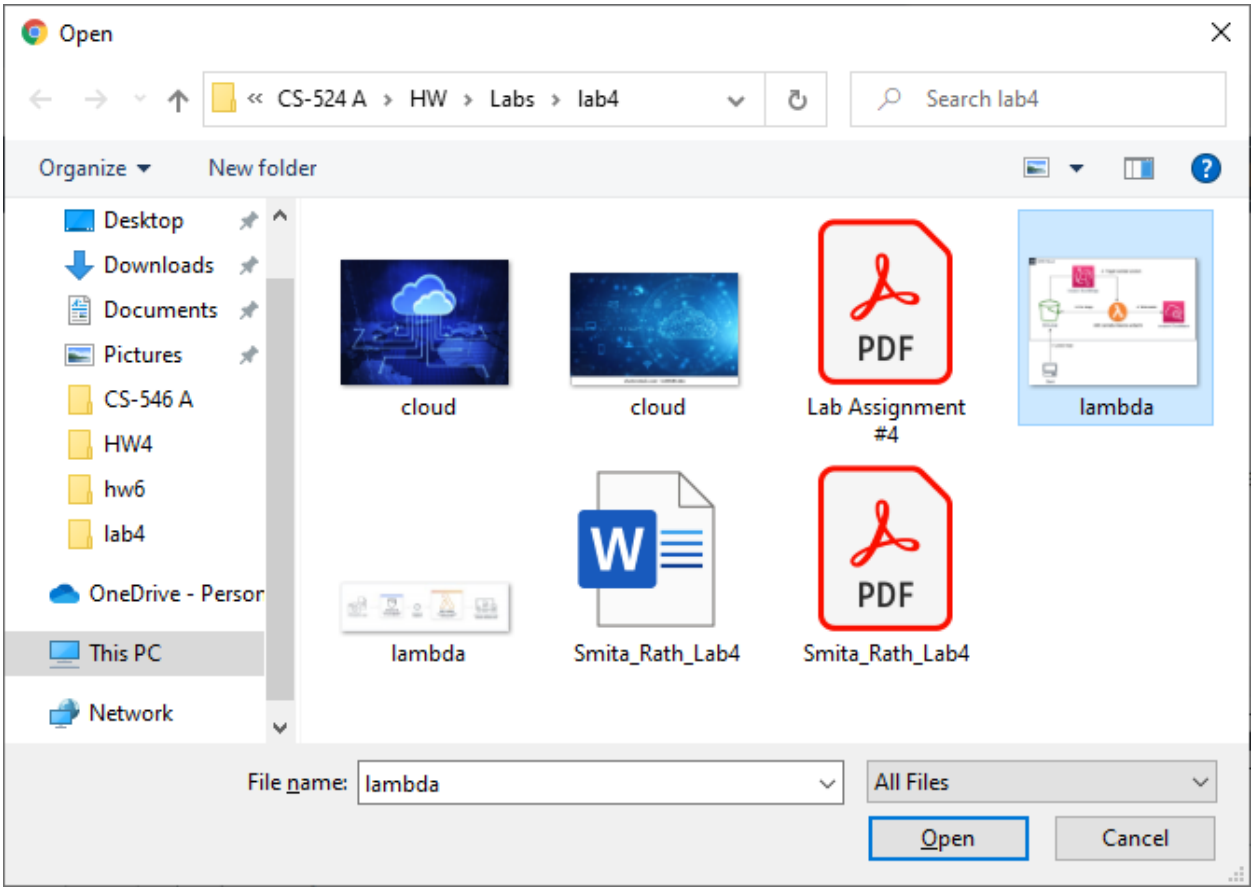
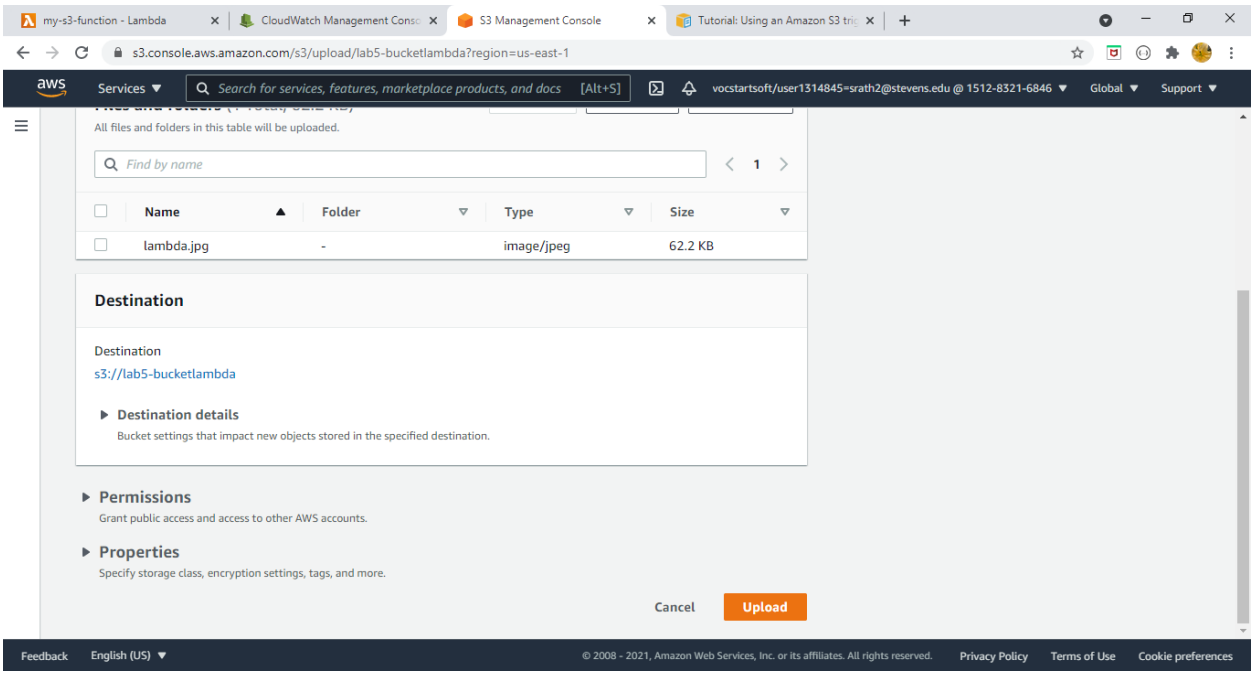
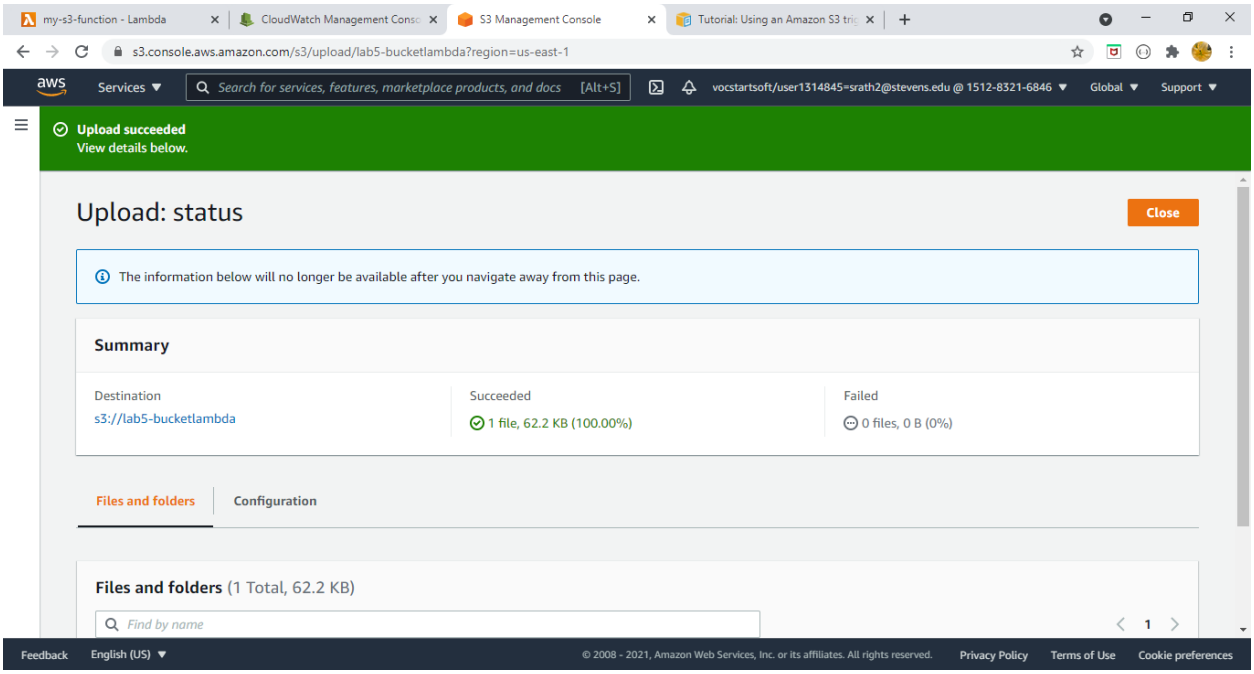
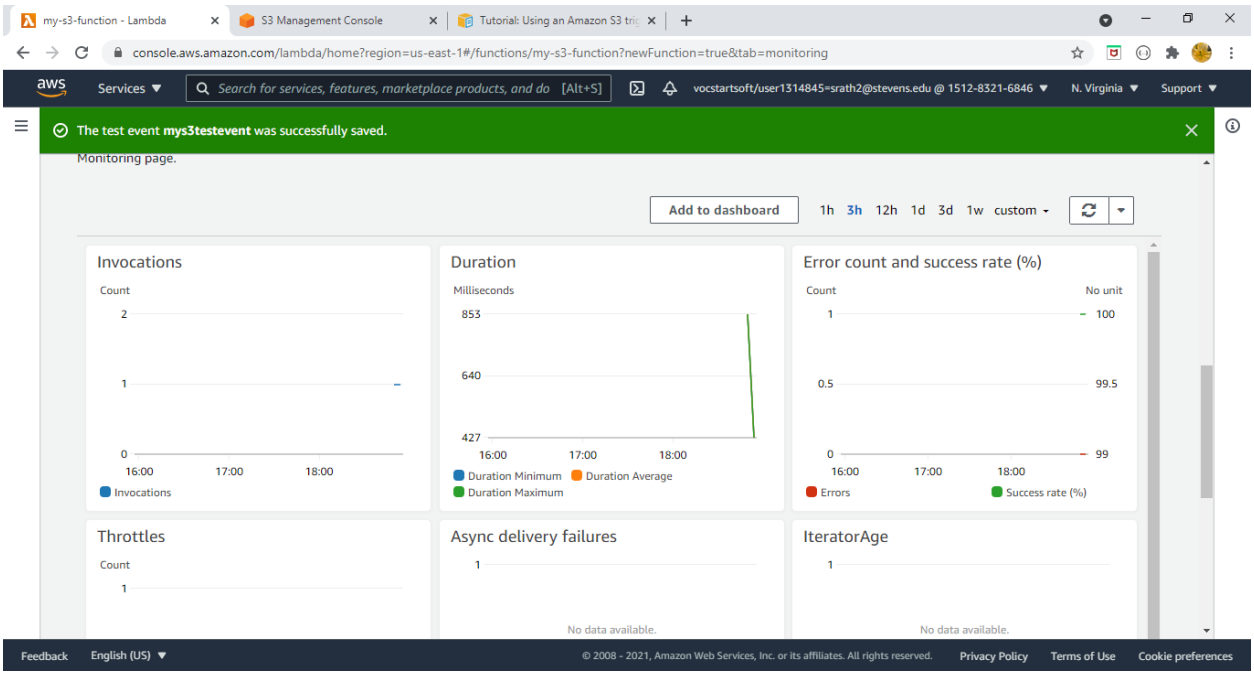

Open
CS-524 A > HW > Labs > lab4
Search lab4
Organize
New folder
Desktop
Downloads
Documents
Pictures
CS-546 A
HW4
hw6
lab4
OneDrive - Persor
This PC
Network
cloud
cloud
Lab Assignment #4
lambda
lambda
Smita_Rath_Lab4
Smita_Rath_Lab4
File name: lambda
All Files
Open
Cancel

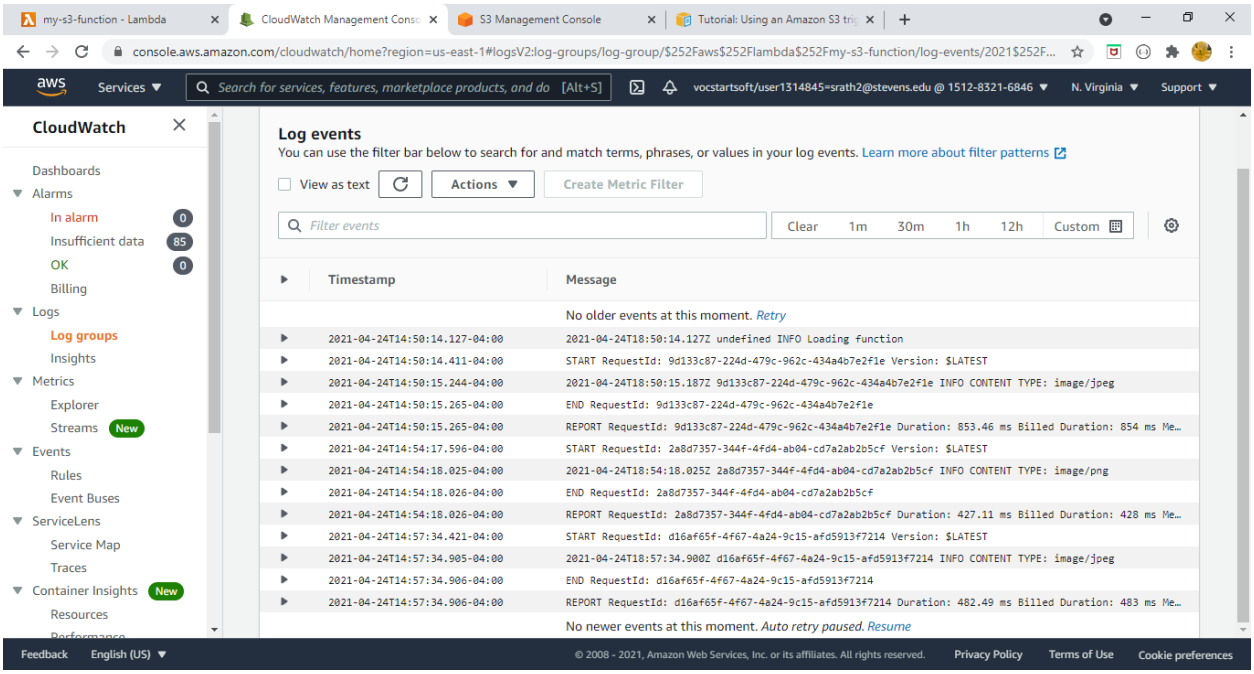


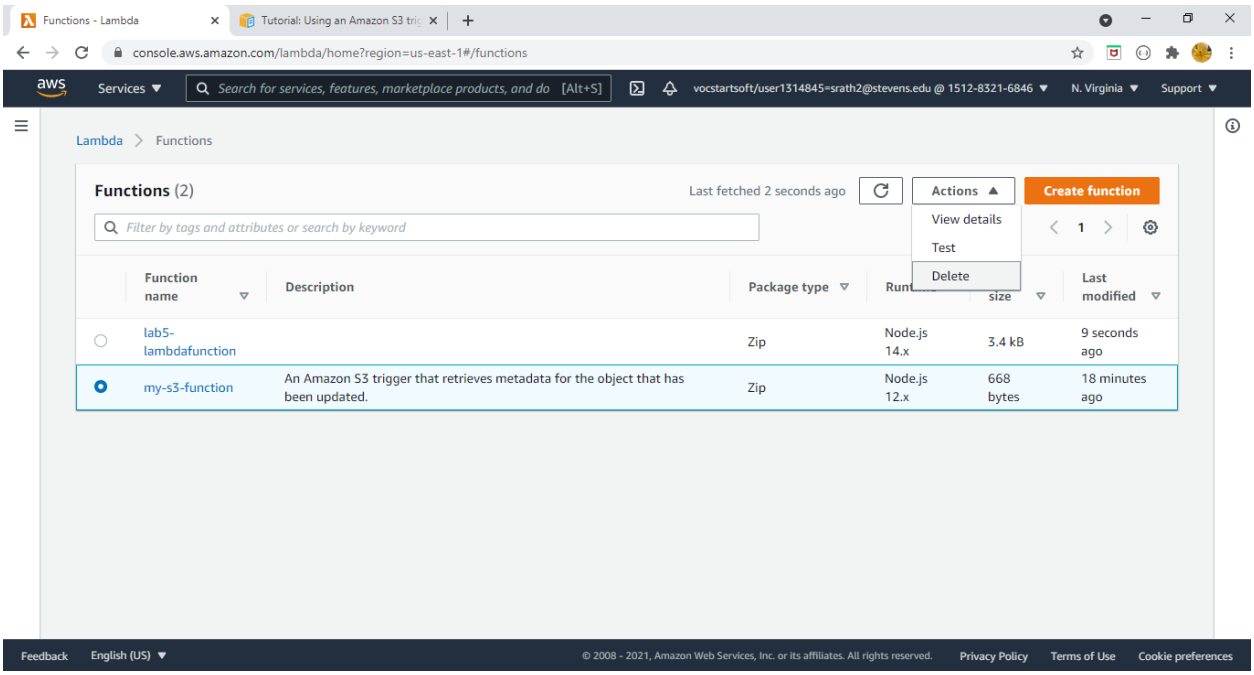
Once uploaded the lambda function will be invoked.

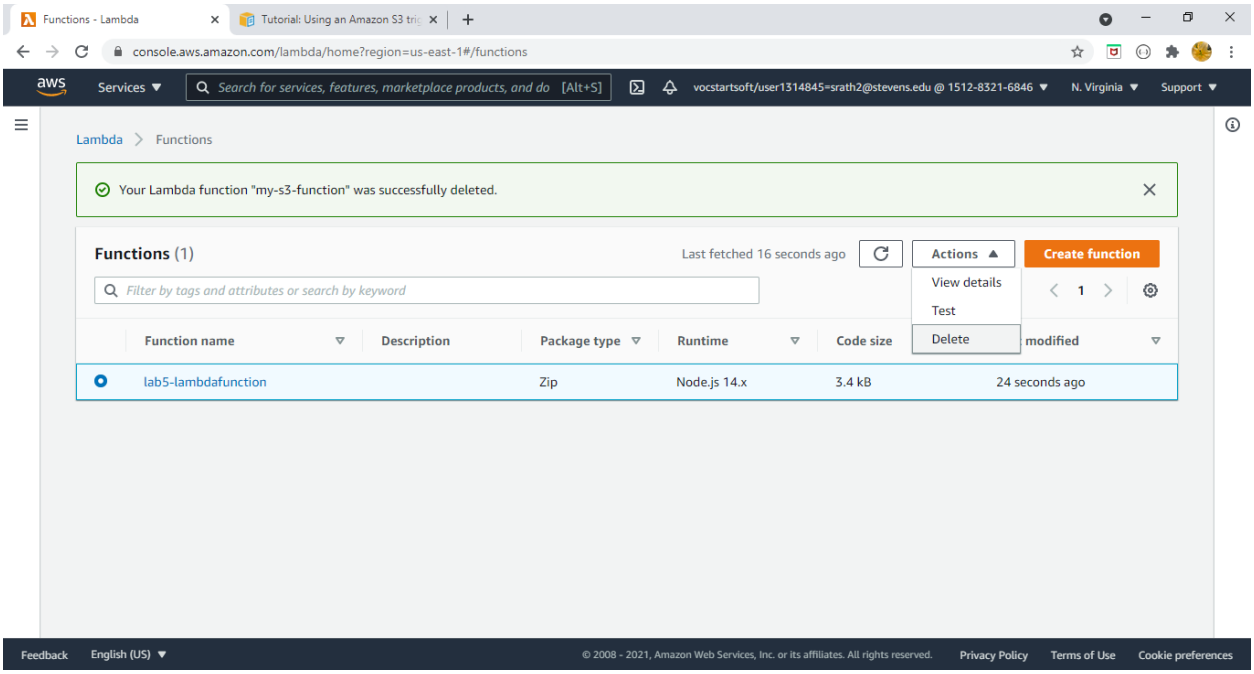




Logs generated after uploading the new image in S3 bucket.







So, in this way lambda function can be used for uploading images in S3 bucket which can be used for processing images. Also, lambda function can be invoked with the Lambda API, the AWS SDK, the AWS CLI, and AWS toolkits. We can also configure other AWS services to invoke our function, or you can configure Lambda to read from a stream or queue and invoke your function.

When we invoke a function, we can choose to invoke it synchronously or asynchronously.With synchronous invocation, we wait for the function to process the event and return a response. With asynchronous invocation, Lambda queues the event for processing and returns a response immediately. For asynchronous invocation, Lambda handles retries and can send invocation records to a destination.

To use function to process data automatically, add one or more triggers. A trigger is a Lambda resource or a resource in another service that we configure to invoke our function in response to lifecycle events, external requests, or on a schedule. Function can have multiple triggers. Each trigger acts as a client invoking function independently. Each event that Lambda passes to the function only has data from one client or trigger.

https://docs.aws.amazon.com/lambda/latest/dg/lambda-invocation.html

https://docs.aws.amazon.com/lambda/latest/dg/getting-started-create-function.html

https://docs.aws.amazon.com/lambda/latest/dg/services-apigateway.html

https://docs.aws.amazon.com/lambda/latest/dg/with-s3-example.html