

Swinburne University of Technology

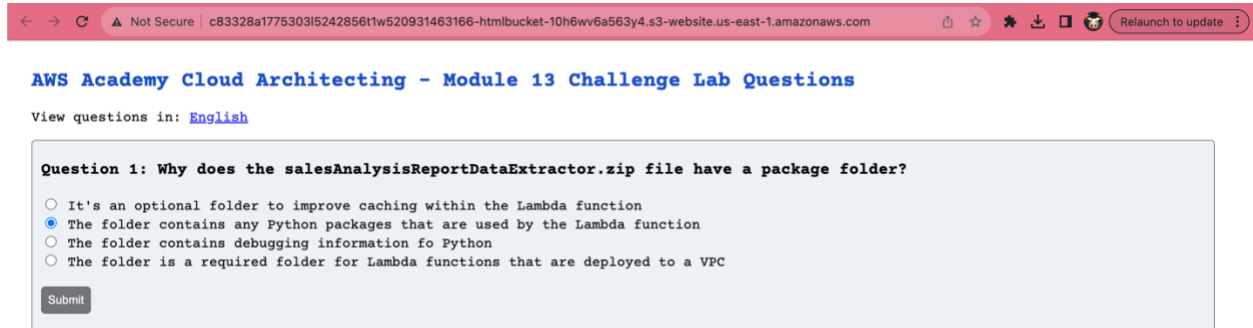
COS20019 Cloud Computing Architecture

Module 13 Challenge Lab - Implementing a Serverless Architecture for the Café

Saturday 11th October, 2023

Task 1: Downloading the source code

Question 1: Why does the *salesAnalysisReportDataExtractor.zip* file have a package folder?



AWS Academy Cloud Architecting - Module 13 Challenge Lab Questions

View questions in: [English](#)

Question 1: Why does the *salesAnalysisReportDataExtractor.zip* file have a package folder?

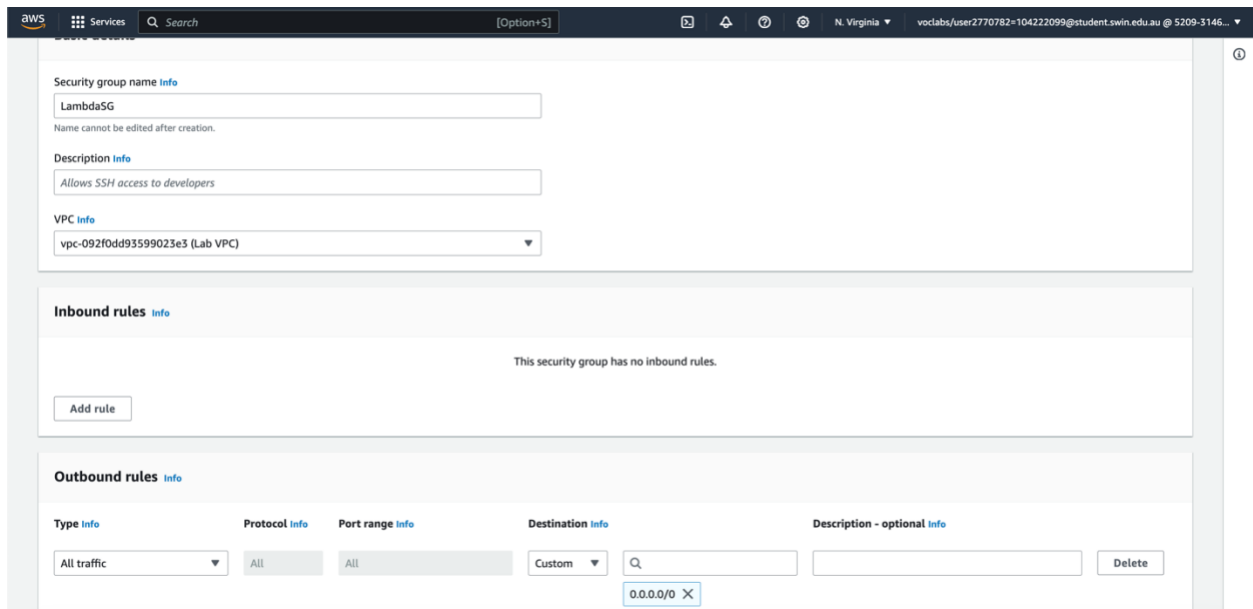
- ☐ It's an optional folder to improve caching within the Lambda function
- ☒ The folder contains any Python packages that are used by the Lambda function
- ☐ The folder contains debugging information for Python
- ☐ The folder is a required folder for Lambda functions that are deployed to a VPC

[Submit](#)

Task 2: Creating the *DataExtractor* Lambda function in the VPC

Create a security group for the Lambda function with the following settings:

- **Security group name:** LambdaSG
- **VPC:** *Lab VPC*
- **Outbound Rules:** *All traffic* to all addresses



AWS IAM console - Security groups

Security group name [Info](#)

LambdaSG

Name cannot be edited after creation.

Description [Info](#)

Allows SSH access to developers

VPC [Info](#)

vpc-092f0dd93599023e3 (Lab VPC)

Inbound rules [Info](#)

This security group has no inbound rules.

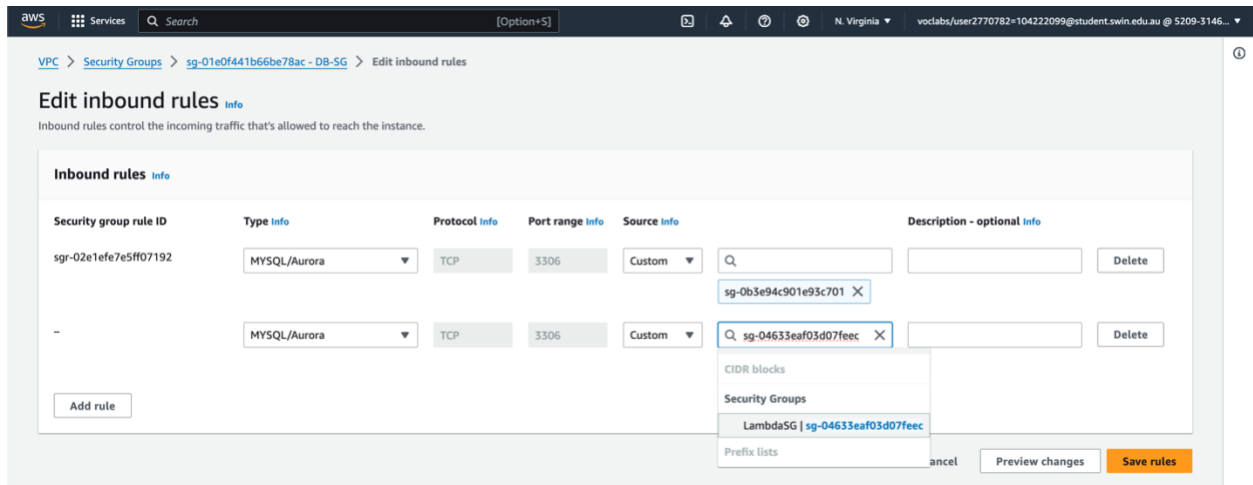
[Add rule](#)

Outbound rules [Info](#)

Type Info	Protocol Info	Port range Info	Destination Info	Description - optional Info
All traffic	All	All	Custom 0.0.0.0/0	

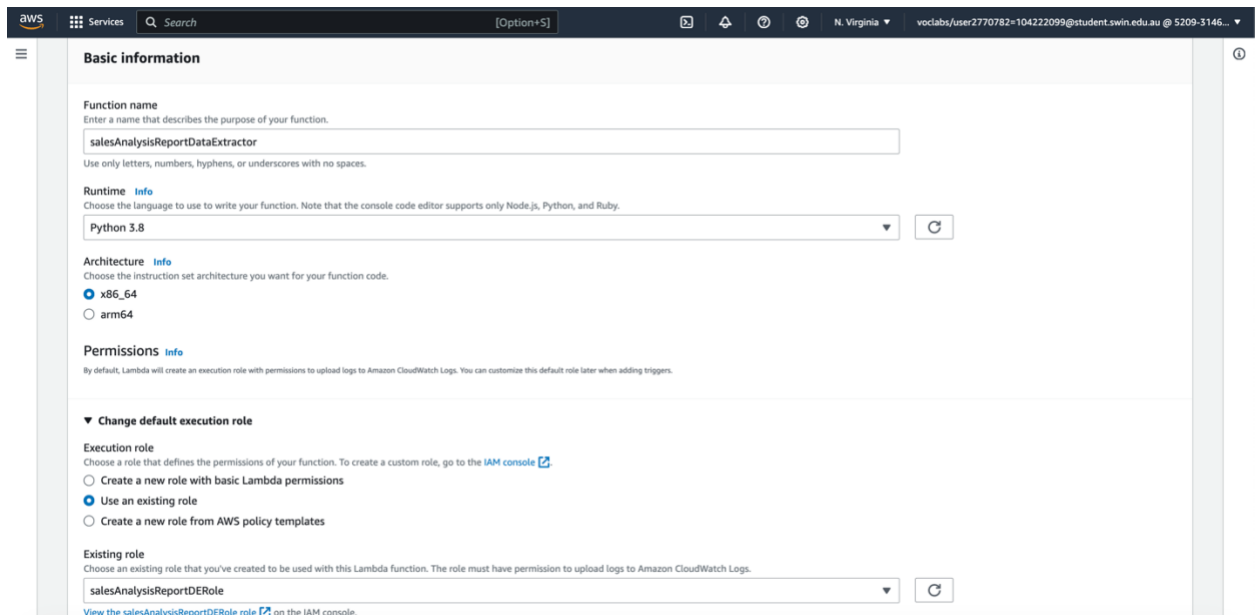
[Delete](#)

Update the **DatabaseSG** security group. Add a second inbound rule. For the new rule, configure the **Type** as **MYSQL/Aurora**. Then, in the search box to the right of **Custom**, type **sg-** and choose your new Lambda function security group as the source. Finally, choose **Save rules**.

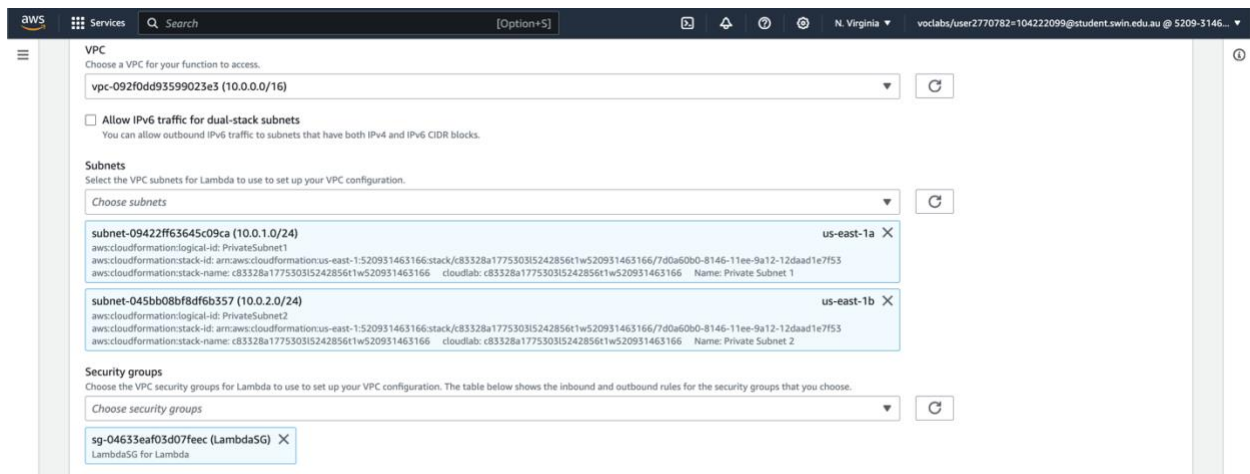


Create a Lambda function with the following settings:

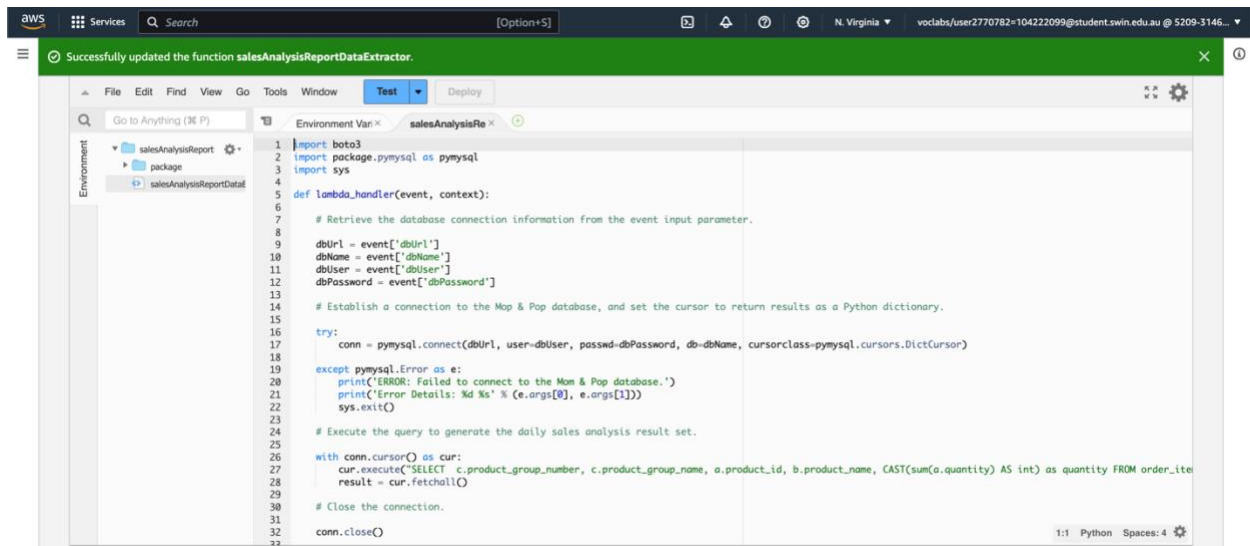
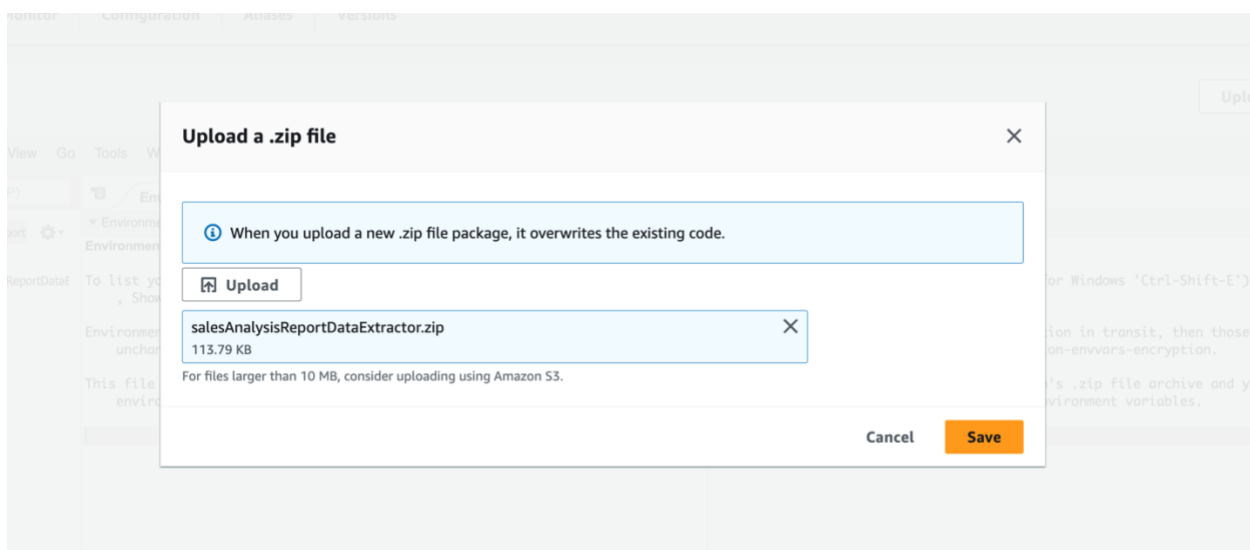
- **Function name:** salesAnalysisReportDataExtractor
- **Runtime:** *Python 3.8*
- **Role:** *salesAnalysisReportDERole*



- **VPC:**
 - **VPC:** *Lab VPC*
 - **Subnets:** *Private subnet 1* and *Private subnet 2*
 - **Security Group:** The Lambda function security group that you created



Upload the *salesAnalysisReportDataExtractor.zip* file



Configure the *DataExtractor* Lambda function as follows:

- **Description:** Lambda function to extract data from database
- **Handler:** salesAnalysisReportDataExtractor.lambda_handler
- **Memory Size:** 128 MB
- **Timeout** (seconds): 30

The screenshot shows the AWS Lambda console configuration page for a new function. The 'Description' field is set to 'Lambda function to extract data from database'. The 'Memory' is set to 128 MB. The 'Ephemeral storage' is set to 512 MB. The 'SnapStart' is set to 'None'. The 'Timeout' is set to 0 minutes and 30 seconds. The 'Execution role' is set to 'Use an existing role'. The 'Existing role' is set to 'salesAnalysisReportDERole'.

The screenshot shows the 'Edit runtime settings' page for the Lambda function. The 'Runtime' is set to 'Python 3.8'. A notification box states: 'New runtime available. A new runtime is available for your function's language: Python 3.11'. The 'Handler' is set to 'salesAnalysisReportDataExtractor.lambda_handler'. The 'Architecture' is set to 'x86_64'. A notification box states: 'You can change either the function's runtime or the instruction set architecture in one update. To update both, you must repeat the update process.' The 'Save' button is highlighted in orange.

Question 2: Why must the *salesAnalysisReportDataExtractor* be in a VPC?

← → ↻

Not Secure | c83328a177530315242856t1w520931463166-htmlbucket-10h6wv6a563y4.s3-website.us-east-1.amazonaws.com

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Relaunch to update ⓘ

Question 2: Why must the salesAnalysisReportDataExtractor be in a VPC?

☐ The Lambda function must be able to communicate with the web server instance

☒ The Lambda function must be able to communicate with the RDS instance

☐ This Lambda function must be set up differently than the other Lambda function

☐ This Lambda function must be able to communicate with an email server

Submit

Task 3: Creating the *salesAnalysisReport* Lambda function

Create a second Lambda function with the following settings:

- **Function name:** salesAnalysisReport
- **Runtime:** *Python 3.8*
- **Role:** *salesAnalysisReportRole*

aws

Services

Search

[Option+S]

📄

🔔

🔒

🔄

N. Virginia

votlabs/user2770782=104222099@student.swin.edu.au @ 5209-3146...

🔍

Basic information

Function name

Enter a name that describes the purpose of your function.

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.

▼

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

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

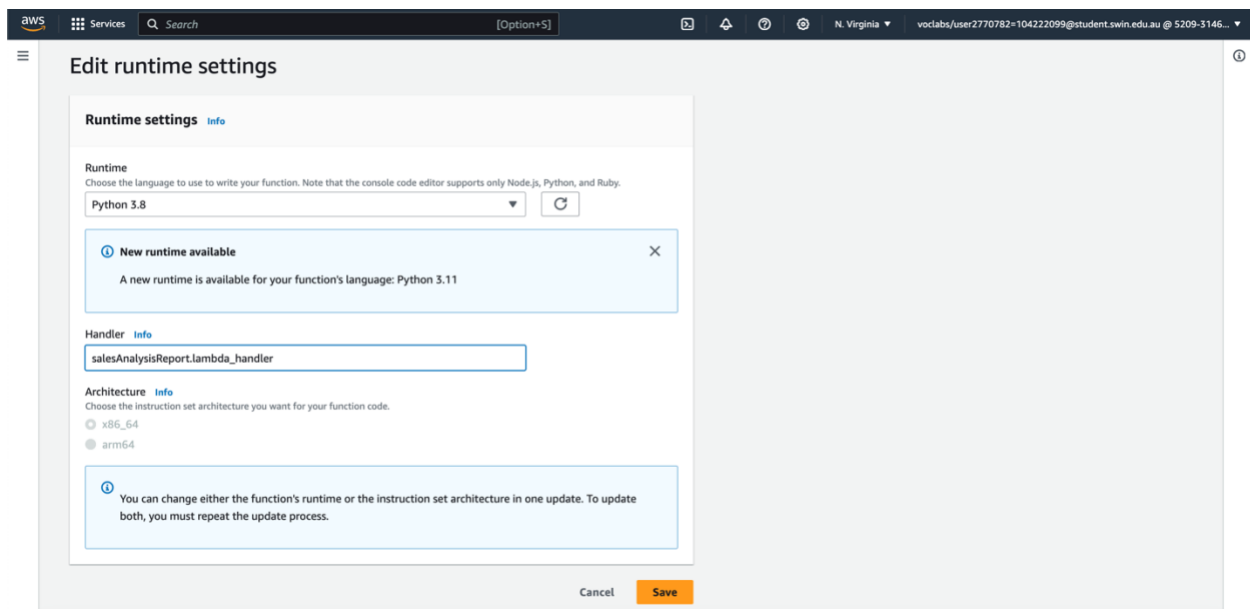
☐ Create a new role from AWS policy templates

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.

▼

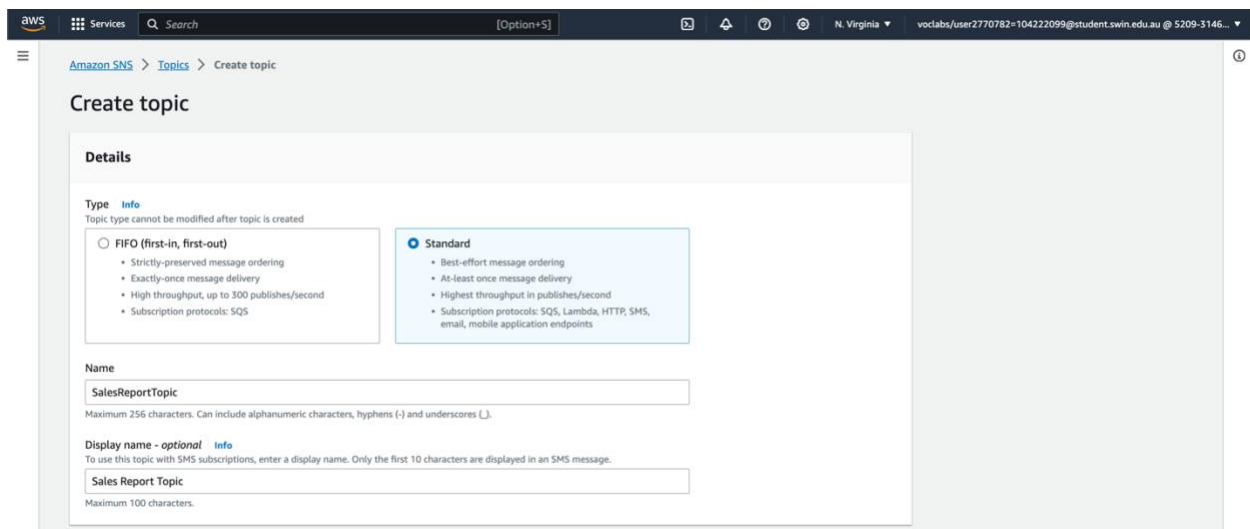
[View the salesAnalysisReportRole role](#) on the IAM console.



Task 4: Creating an SNS topic

Create a standard SNS topic with the following configuration:

- **Name:** SalesReportTopic
- **Display Name:** Sales Report Topic



Update the *salesAnalysisReport* Lambda function by adding the following environment variable:

- **Variable Name:** topicARN
- **Variable Value:** The ARN of the topic you just created

Edit environment variables

Environment variables

You can define environment variables as key-value pairs that are accessible from your function code. These are useful to store configuration settings without the need to change function code. [Learn more](#)

Key	Value	
topicARN	The ARN of the topic you just created	Remove

[Add environment variable](#)

► Encryption configuration

[Cancel](#) [Save](#)

Question 3: Could the *topicARN* be stored as an AWS Systems Manager parameter instead of as an environment variable (assuming that the code could be updated)?

Question 3: Could the *topicARN* be stored as an AWS Systems Manager parameter instead of as an environment variable (assuming that the code could be updated)?

☒ Yes
☐ No

[Submit](#)

Task 5: Creating an email subscription to the SNS topic

Create a new email subscription to the topic. Use an email address that you can easily access for this lab.

Create subscription

Details

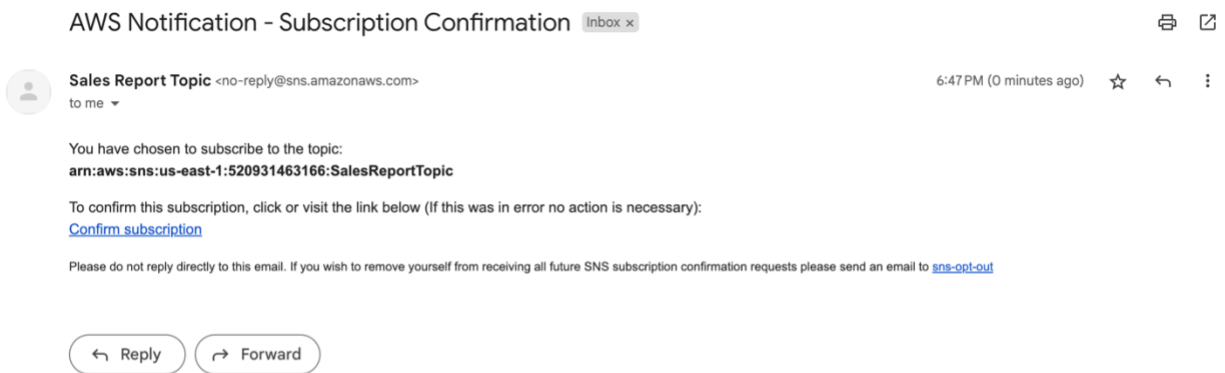
Topic ARN
 arn:aws:sns:us-east-1:520931463166:SalesReportTopic

Protocol
 The type of endpoint to subscribe
 Email

Endpoint
 An email address that can receive notifications from Amazon SNS.
 fanvu2004@gmail.com

After your subscription is created, you must confirm it. [Info](#)

Confirm the email subscription from your email client.



Question 4: Will you receive an email message if you do not confirm the topic subscription?

Question 4: Will you receive an email message if you do not confirm the topic subscription?

☐ Yes

☒ No

Submit

Task 6: Testing the *salesAnalysisReport* Lambda function

Create a test for the *salesAnalysisReport* Lambda function.

Configure test event



A test event is a JSON object that mocks the structure of requests emitted by AWS services to invoke a Lambda function. Use it to see the function's invocation result.

To invoke your function without saving an event, configure the JSON event, then choose Test.

Test event action

☒ Create new event

☐ Edit saved event

Event name

hello-world

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

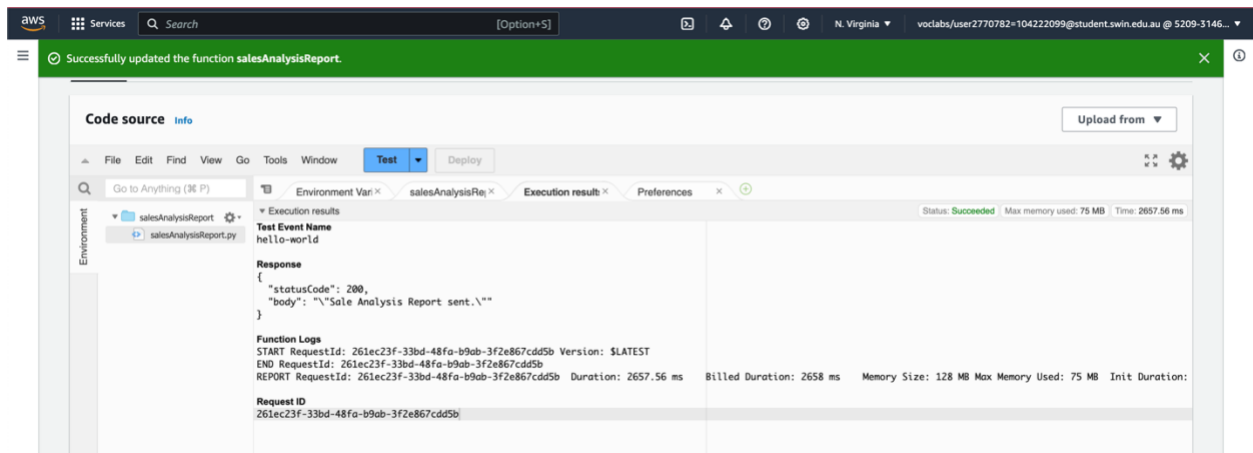
```
1 {  
2   "key1": "value1",  
3   "key2": "value2",  
4   "key3": "value3"  
5 }
```

Cancel

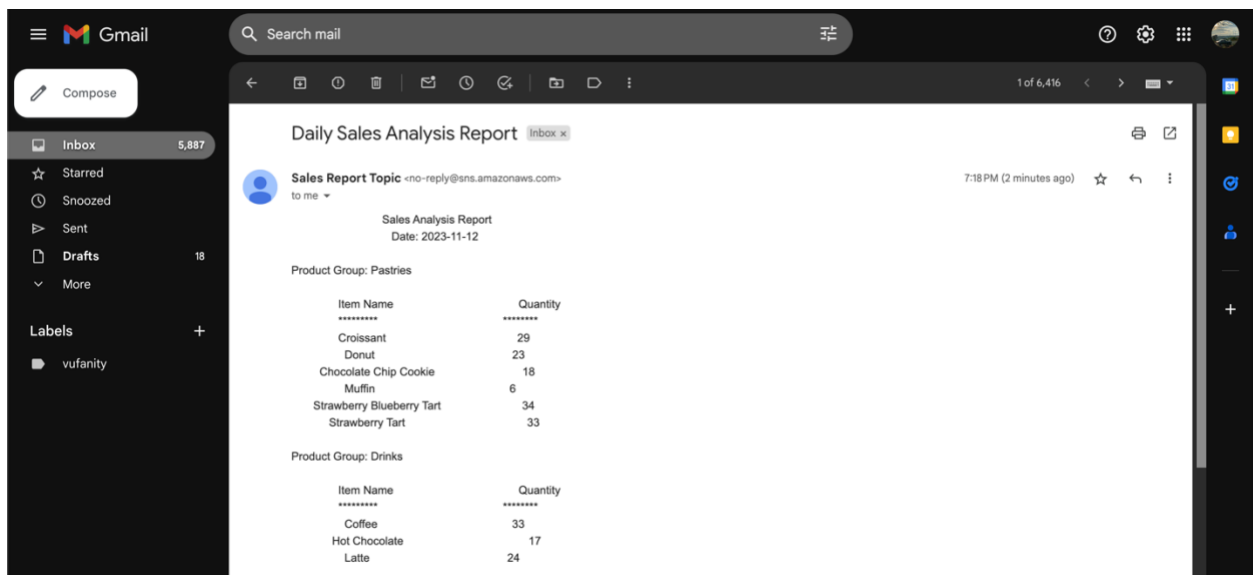
Invoke

Save

Run the *salesAnalysisReport* test.



Sales report email



Task 7: Setting up an Amazon EventBridge event to trigger the Lambda function each day

Create a new EventBridge rule that runs the *salesAnalysisReport* Lambda function each day at a specific time. Make sure to choose **Continue to create rule**.

aws Services Search [Option+S] N. Virginia voclabs/user2770782=10422099@student.swin.edu.au @ 5209-3146...

Trigger configuration [Info](#)

EventBridge (CloudWatch Events)
aws asynchronous schedule management-tools

Rule
Pick an existing rule, or create a new one.
☒ Create a new rule
☐ Existing rules

Rule name
Enter a name to uniquely identify your rule.
salesAnalysisReport

Rule description
Provide an optional description for your rule.
Lambda function to generate and send the daily sales report

Rule type
Trigger your target based on an event pattern, or based on an automated schedule.
☐ Event pattern
☒ Schedule expression

Schedule expression
Self-trigger your target on an automated schedule using [Cron or rate expressions](#). Cron expressions are in UTC.
cron(22 * * * *)
e.g. rate(1 day), cron(0 17 ? * MON-FRI *)

Lambda will add the necessary permissions for Amazon EventBridge (CloudWatch Events) to invoke your Lambda function from this trigger. [Learn more](#) about the Lambda permissions model.

Trigger created

aws Services Search [Option+S] N. Virginia voclabs/user2770782=10422099@student.swin.edu.au @ 5209-3146...

Lambda > Functions > salesAnalysisReport

salesAnalysisReport

Throttle Copy ARN Actions

Function overview [Info](#)

salesAnalysisReport

Layers (0)

EventBridge (CloudWatch Events)

+ Add trigger

+ Add destination

Description
Lambda function to generate and send the daily sales report

Last modified
11 minutes ago

Function ARN
arn:aws:lambda:us-east-1:520931463166:function:salesAnalysisReport

Function URL [Info](#)
-

Schedule that I updated again to match with current UTC time.

aws Services Search [Option+S] N. Virginia voclabs/user2770782=104222099@student.swin.edu.au @ 5209-3146...

Amazon EventBridge

- Developer resources
 - Learn
 - Sandbox
 - Quick starts
- Buses
 - Event buses
 - Rules**
 - Global endpoints
 - Archives
 - Replays
- Pipes
 - Pipes
- Scheduler
 - Schedules
 - Schedule groups
- Integration
 - Partner event sources
 - API destinations
- Schema registry

Rule details

Rule name salesAnalysisReport	Status Enabled	Event bus name default	Type Scheduled Standard
Description Lambda function to generate and send the daily sales report	Rule ARN arn:aws:events:us-east-1:520931463166:rule/salesAnalysisReport	Event bus ARN arn:aws:events:us-east-1:520931463166:event-bus/default	

Event schedule | Targets | Monitoring | Tags

Event schedule

Cron expression
35 12 ? * * *

Next 10 trigger date(s)

Local time zone

Sun, Nov 12, 2023, 07:35 PM GMT+7
 Mon, Nov 13, 2023, 07:35 PM GMT+7
 Tue, Nov 14, 2023, 07:35 PM GMT+7
 Wed, Nov 15, 2023, 07:35 PM GMT+7
 Thu, Nov 16, 2023, 07:35 PM GMT+7
 Fri, Nov 17, 2023, 07:35 PM GMT+7
 Sat, Nov 18, 2023, 07:35 PM GMT+7
 Sun, Nov 19, 2023, 07:35 PM GMT+7
 Mon, Nov 20, 2023, 07:35 PM GMT+7
 Tue, Nov 21, 2023, 07:35 PM GMT+7

Sales Report Topic <no-reply@sns.amazonaws.com> 7:35 PM (0 minutes ago) ☆ ↶ ⋮

to me

Sales Analysis Report
Date: 2023-11-12

Product Group: Pastries

Item Name	Quantity
Croissant	29
Donut	23
Chocolate Chip Cookie	18
Muffin	6
Strawberry Blueberry Tart	34
Strawberry Tart	33

Product Group: Drinks

Item Name	Quantity
Coffee	33
Hot Chocolate	17
Latte	24

Question 5: Frank tells you that he hasn't received an email report in the last few days. What could you do to troubleshoot this issue?

Question 5: Frank tells you that he hasn't received an email report in the last few days. What could you do to troubleshoot this issue?

- ☐ Restart the Lambda function because it might be stuck
- ☐ Update the Python version
- ☒ Use the logs from Amazon CloudWatch Logs and review them for errors
- ☐ Use the AWS CloudTrail logs and review them for errors

Submit

Submitting work

Submit

Details ▾

AWS

Start Lab

End Lab

1:49

Instructions

Grades

Actions ▾

Files ☐

README ☒

Terminal ☐

Source ☐

EN_US ▾

Total score

35/35

ENDLAB.