

Database Assignment

Similarly it'll create one more read replica and you can run SQL commands directly from the terminal.
Let's proceed to 3rd assignment on DynamoDB

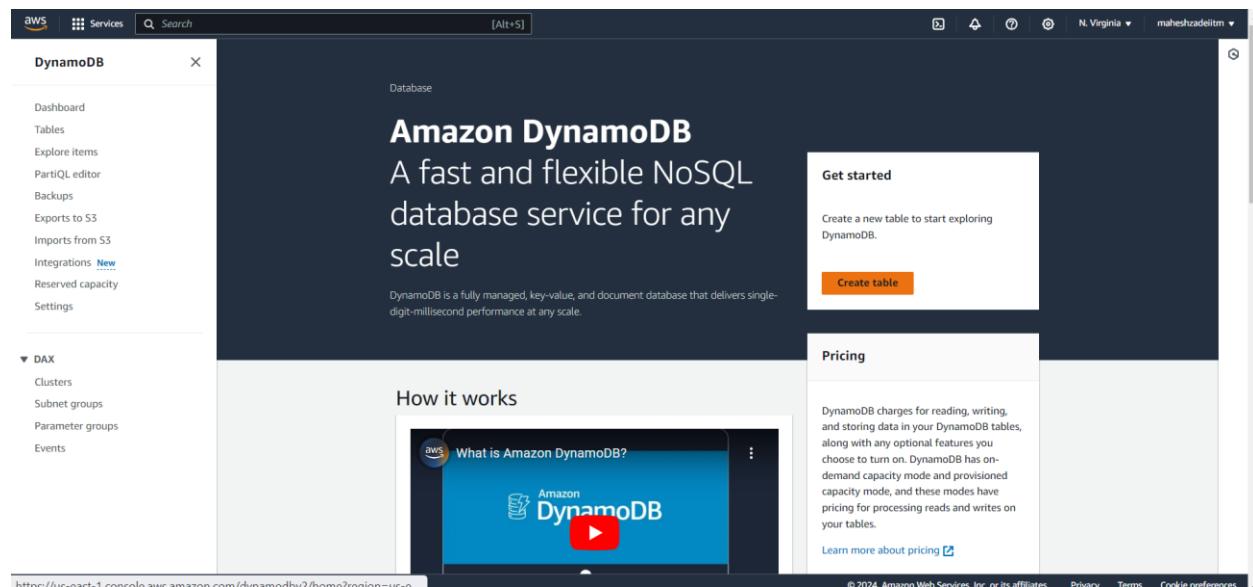
Problem Statement:

You work for XYZ Corporation. Their application requires a database service that can store data which can be retrieved if required. Implement a suitable service for the same.

While migrating, you are asked to perform the following tasks:

1. Create a DynamoDB table with partition key as ID.
2. Add 5 items to the DynamoDB table.
3. Take backup and delete the table.

Go to AWS Management Console → DynamoDB → Create Table



Create table

Table details Info

DynamoDB is a schemaless database that requires only a table name and a primary key when you create the table.

Table name
This will be used to identify your table.

Between 3 and 255 characters, containing only letters, numbers, underscores (_), hyphens (-), and periods (.)

Partition key
The partition key is part of the table's primary key. It is a hash value that is used to retrieve items from your table and allocate data across hosts for scalability and availability.

Sort key - optional
You can use a sort key as the second part of a table's primary key. The sort key allows you to sort or search among all items sharing the same partition key.

1 to 255 characters and case sensitive.

Keep the remaining settings as it is and click on Create Table

AWS will create the table, which may take a few moments

Table settings

Default settings
The fastest way to create your table. You can modify these settings now or after your table has been created.

Customize settings
Use these advanced features to make DynamoDB work better for your needs.

Default table settings
These are the default settings for your new table. You can change some of these settings after creating the table.

Setting	Value	Editable after creation
Table class	DynamoDB Standard	Yes
Capacity mode	Provisioned	Yes
Provisioned read capacity	5 RCU	Yes
Provisioned write capacity	5 WCU	Yes
Auto scaling	On	Yes
Local secondary indexes	-	No
Global secondary indexes	-	Yes
Encryption key management	Owned by Amazon DynamoDB	Yes
Deletion protection	Off	Yes
Resource-based policy	Not active	Yes

My dynamodb is creating.

The screenshot shows the AWS DynamoDB service dashboard. On the left, there's a sidebar with options like Dashboard, Tables, Explore items, PartiQL editor, Backups, Exports to S3, Imports from S3, Integrations, Reserved capacity, and Settings. Under Tables, 'Explore items' is selected. The main area shows a table titled 'Tables (1) Info'. A single row is listed: Name is 'mydynamodbtable', Status is 'Creating', Partition key is 'ID (\$)', Sort key is '-', Indexes is '0', Deletion protection is 'Off', Read capacity mode is 'Provisioned (5)', Write capacity mode is 'Provisioned (5)', Total size is '0 bytes', and Standard is 'Standard'. At the top right of the table view, there are buttons for Actions, Delete, and Create table.

AWS will create the table, which may take a few moments

This screenshot shows the same AWS DynamoDB interface after the table has been successfully created. The table list now shows one entry: 'mydynamodbtable' with a status of 'Active'. All other details remain the same as in the previous screenshot. The status message at the top of the main area now says 'The mydynamodbtable table was created successfully.'

Go to Action>> Select explore items

In this screenshot, the 'Actions' dropdown menu is open over the table row for 'mydynamodbtable'. The 'Explore items' option is highlighted with a blue selection bar. Other options visible in the dropdown include 'Update settings', 'Add tag to selection', 'Remove tags from selection', and 'Turn on deletion protection'. The rest of the interface is identical to the previous screenshots, showing the table details and the success message.

DynamoDB > Explore items > mydynamodbtable

Tables (1)

mydynamodbtable

Scan or query items

Completed. Read capacity units consumed: 0.5

Items returned (0)

No items

Create item

Click on create items

DynamoDB > Explore items > mydynamodbtable

Tables (1)

mydynamodbtable

Scan or query items

Completed. Read capacity units consumed: 0.5

Items returned (0)

No items

Create item

Add the required attribute and their values and Click on Create Item

DynamoDB > Explore items: mydynamodbtable > Create item

Create item

You can add, remove, or edit the attributes of an item. You can nest attributes inside other attributes up to 32 levels deep. [Learn more](#)

Attributes		Add new attribute ▾
Attribute name	Value	Type
ID - Partition key	1	String
name	item 1	String
description	description 1	String

✖ You must provide the partition key attribute ID with a non-empty value.

[Cancel](#) [Create item](#)

DynamoDB > Explore items: mydynamodbtable > Create item

Create item

You can add, remove, or edit the attributes of an item. You can nest attributes inside other attributes up to 32 levels deep. [Learn more](#)

Attributes		Add new attribute ▾
Attribute name	Value	Type
ID - Partition key	2	String
name	item 2	String
descriptio	description 2	String

[Cancel](#) [Create item](#)

DynamoDB > Explore items > mydynamodbtable

Tables (1)		View table details																								
Any tag key	Any tag value	Autopreview																								
Find tables by table name		Scan or query items																								
< 1 > Go		Completed. Read capacity units consumed: 0.5																								
mydynamodbtable		Actions ▾ Create item																								
<table border="1"> <thead> <tr> <th>ID (String)</th> <th>description</th> <th>Name</th> <th>name</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>description-5</td> <td>Item -5</td> <td></td> </tr> <tr> <td>4</td> <td>description-4</td> <td>Item-4</td> <td></td> </tr> <tr> <td>3</td> <td>description-3</td> <td></td> <td>item-3</td> </tr> <tr> <td>2</td> <td>description-2</td> <td>item-2</td> <td></td> </tr> <tr> <td>1</td> <td>description-1</td> <td></td> <td>item 1</td> </tr> </tbody> </table>			ID (String)	description	Name	name	5	description-5	Item -5		4	description-4	Item-4		3	description-3		item-3	2	description-2	item-2		1	description-1		item 1
ID (String)	description	Name	name																							
5	description-5	Item -5																								
4	description-4	Item-4																								
3	description-3		item-3																							
2	description-2	item-2																								
1	description-1		item 1																							

Similarly created 4 more items

5 Items are added successfully

Let's take the backup and delete this table. Go to Backup from the left menu

Create on-demand backup

Create a one-time snapshot backup of your table. Schedule automatic backups of your table in AWS Backup [\[AWS Backup\]](#)

Source table [Info](#)

Source table [X](#) [C](#)

Backup settings [Info](#)
A backup name will be created automatically.

Default settings Create a backup that stays in warm storage.

Customize settings Create a backup that can transition to cold storage and be deleted as it ages.

Backup window	Backup management	Transition to cold storage
Start in 1 hour	AWS Backup	Never
Retention period	Backup vault	IAM Role
Always	Default	AWSBackupDefaultServiceRole

Click on create backup

Backup settings [Info](#)
A backup name will be created automatically.

Default settings Create a backup that stays in warm storage.

Customize settings Create a backup that can transition to cold storage and be deleted as it ages.

Backup window	Backup management	Transition to cold storage
Start in 1 hour	AWS Backup	Never
Retention period	Backup vault	IAM Role
Always	Default	AWSBackupDefaultServiceRole

Tags - optional
AWS Backup copies tags from the DynamoDB table to the recovery point upon creation. You can specify additional tags to add to the recovery point.

No tags are associated with the resource.

[Add new tag](#)

You can add 50 more tags.

[Cancel](#) [Create backup](#)

The screenshot shows the AWS DynamoDB Backups page. A green banner at the top indicates that a request to create an on-demand backup for table `mydynamodbtable` has been submitted successfully. The main area displays backup settings and a list of backups. The backup settings section includes options for advanced features with AWS Backup (activated) and cross-Region/cross-account copy, cost allocation tags, and cold storage tiering. The backup list shows 0 backups, with a prominent "Create backup" button.

Click on view details and then click on AWS Backup and it will show job

The screenshot shows the AWS Backup Jobs page. It displays a single backup job entry in the "Backup jobs" table. The job details are as follows:

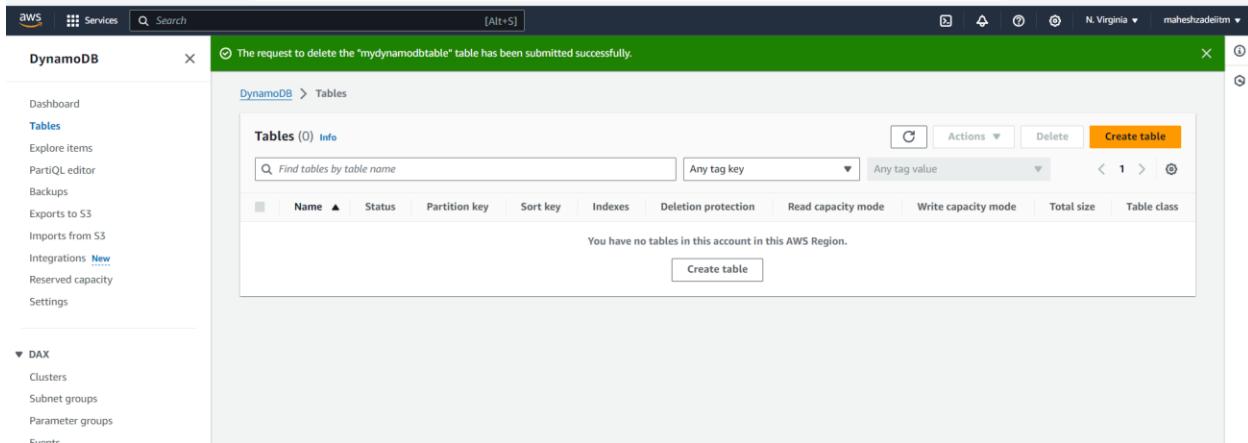
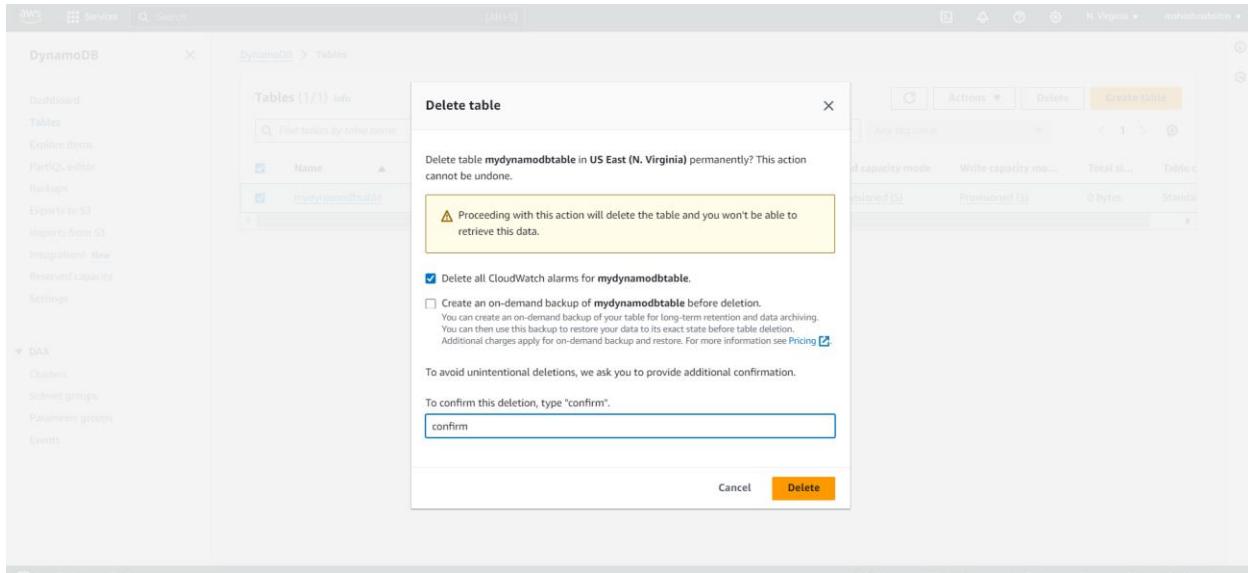
Backup job ID	Status	Resource name	Message category	Resource ID	Resource type	Creation time
B2990FE1-D8D0-B3DB-B2C2-0EEF19906E4C	Running	mydynamodbtable	-	table/mydynamodbtable	DynamoDB	June 27, 2024, 14:2

The screenshot shows the AWS Backup console. On the left, there's a navigation sidebar with sections like 'My account' (Dashboard, Jobs dashboard, Backup vaults, Backup plans, Protected resources, Jobs, Restore testing, Legal holds, Settings), 'External resources' (Gateways, Hypervisors, Virtual machines), 'My organization' (Cross-account monitoring, Backup policies), and 'Backup Audit Manager' (Frameworks). The main content area is titled 'Backup - B2990FE1-D8D0-B3DB-B2C2-0EEF19906E4C'. It displays details about a backup job: Recovery point ARN (arn:aws:backup:us-east-1:058264440832:recovery-point:35a5b1c6-f0a9-405f-929b-aa61d7d79d3c), Status (Pending), Resource name (mydynamodbtable), Resource ID (table/mydynamodbtable), Creation date (June 27, 2024, 14:25:58 (UTC+05:30)), and Start by (June 27, 2024, 15:25:58 (UTC+05:30)). There are buttons for 'Stop backup job' and a refresh icon.

Backup job is created. It'll take some time to backup the table. we can go and delete the table

Select the table and click on Delete.

The screenshot shows the DynamoDB console. The left sidebar includes 'Tables' (Dashboard, Explore items, PartiQL editor, Backups, Exports to S3, Imports from S3, Integrations, Reserved capacity, Settings), 'DAX' (Clusters, Subnet groups, Parameter groups, Events), and other tabs like 'Dashboard', 'Explore items', 'PartiQL editor', etc. The main area is titled 'Tables (1/1) info' and shows a single table named 'mydynamodbtable'. The table details are: Name (mydynamodbtable), Status (Active), Partition key (ID (\$)), Sort key (-), Indexes (0), Deletion protection (Off), Read capacity mode (Provisioned (5)), Write capacity mode (Provisioned (5)), Total size (0 bytes), and Table class (Standard). There are buttons for 'Actions' (with 'Delete' highlighted) and 'Create table'.



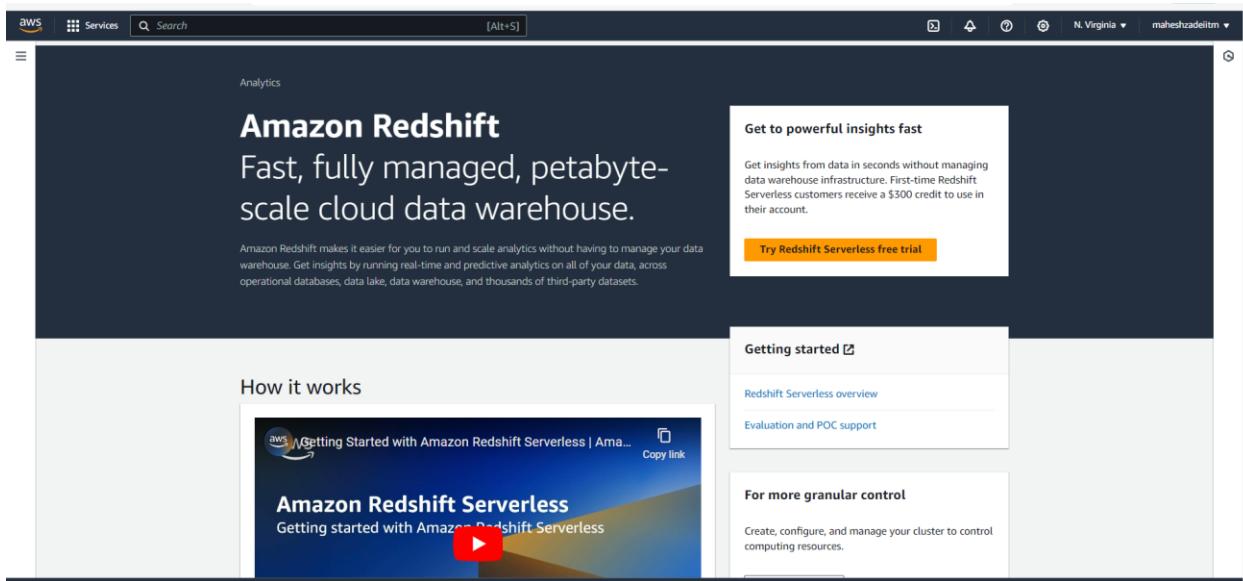
Go to AWS Management Console → Amazon Redshift → Provisioned clusters dashboard → Create Cluster

Problem Statement:

You work for XYZ Corporation. Their application requires a database service that can store data which can be retrieved if required. Implement suitable service for the same.

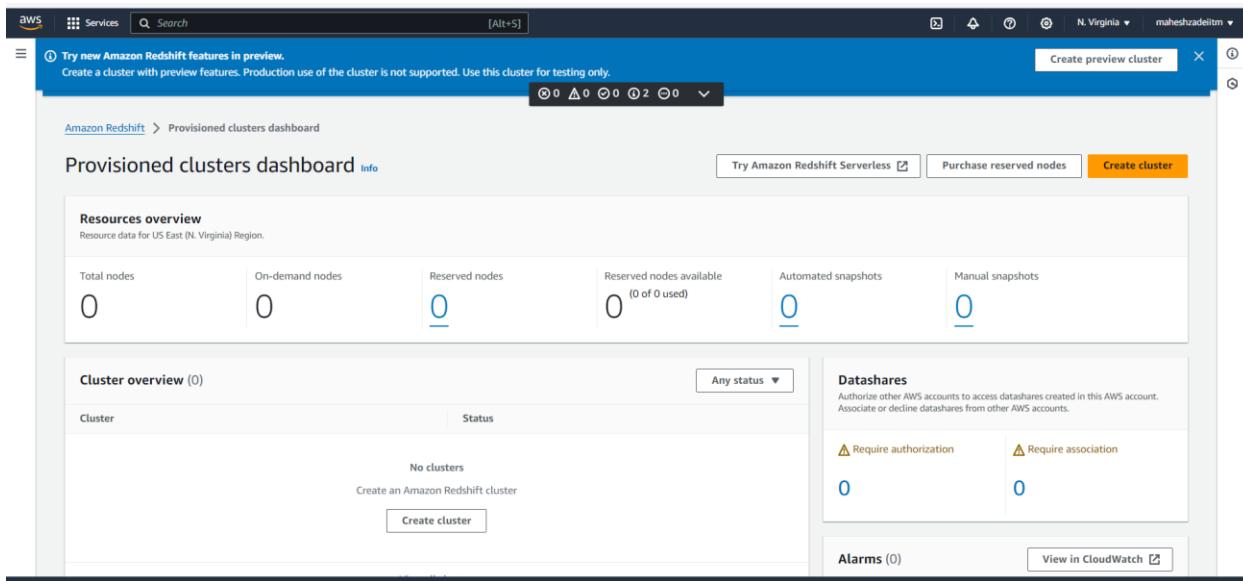
While migrating, you are asked to perform the following tasks:

1. Create a Redshift data warehouse.
2. Using the query editor:
 - a. Load some data
 - b. Query the data



The screenshot shows the Amazon Redshift Analytics landing page. At the top, there's a banner with the heading "Amazon Redshift" and the subtext "Fast, fully managed, petabyte-scale cloud data warehouse." Below the banner, a section titled "How it works" features a video thumbnail for "Getting Started with Amazon Redshift Serverless". To the right, there are two callout boxes: "Get to powerful insights fast" and "For more granular control". A sidebar on the right contains links for "Getting started", "Redshift Serverless overview", and "Evaluation and POC support".

Lick on cluster dashboard



The screenshot shows the Amazon Redshift Provisioned clusters dashboard. A blue header bar displays a message: "Try new Amazon Redshift features in preview. Create a cluster with preview features. Production use of the cluster is not supported. Use this cluster for testing only." Below the header, there are sections for "Resources overview" and "Cluster overview (0)". The "Resources overview" table shows the following data:

Total nodes	On-demand nodes	Reserved nodes	Reserved nodes available (0 of 0 used)	Automated snapshots	Manual snapshots
0	0	0	0	0	0

The "Cluster overview" section shows "No clusters" and has a "Create cluster" button.

Click on create cluster

Create cluster Info

Looking for free trial? Try Redshift Serverless. First-time Redshift Serverless customers receive a \$300 credit to use in their account.

Cluster configuration

Cluster identifier
This is the unique key that identifies a cluster.

Choose the size of the cluster
 I'll choose
 Help me choose

Node type Info
Choose a node type that meets your CPU, RAM, storage capacity, and drive type requirements.

Keep the remaining settings as it is and click on Create Cluster

AZ configuration Info
Choose if you want to deploy the Redshift cluster in another Availability Zone.

Single-AZ
Compute resources are deployed in a single Availability Zone. The cluster is default to use the Current track

Multi-AZ - new
Compute resources are deployed in two Availability Zones. The cluster is default to use the Trailing track

Number of nodes
Enter the number of nodes that you need.

Range (1-32)

Configuration summary Info
ra3.xlplus | 2 nodes

\$1,585.56/month Estimated on-demand compute price Save more than 60% of your costs by purchasing reserved nodes. Learn more about pricing	64 TB Max compressed storage RA3 stores data in Redshift managed storage. Each RA3.xlplus node gets up to 32 TB of compressed data capacity in managed storage to ensure optimal query performance.	\$0.024/GB/month Estimated storage price Pay only for the amount of data you store in managed storage when running an RA3 cluster.
--	--	---

Keep the remaining settings as it is and click on Create Cluster

Admin user name is

awsuser

Admin user name
Enter a login ID for the admin user of your DB instance.

The name must be 1-128 alphanumeric characters, and it can't be a [reserved word](#).

Admin password
Select an option to manage your admin password.
 Manage admin credentials in AWS Secrets Manager Info
AWS manages a KMS key that encrypts your data.

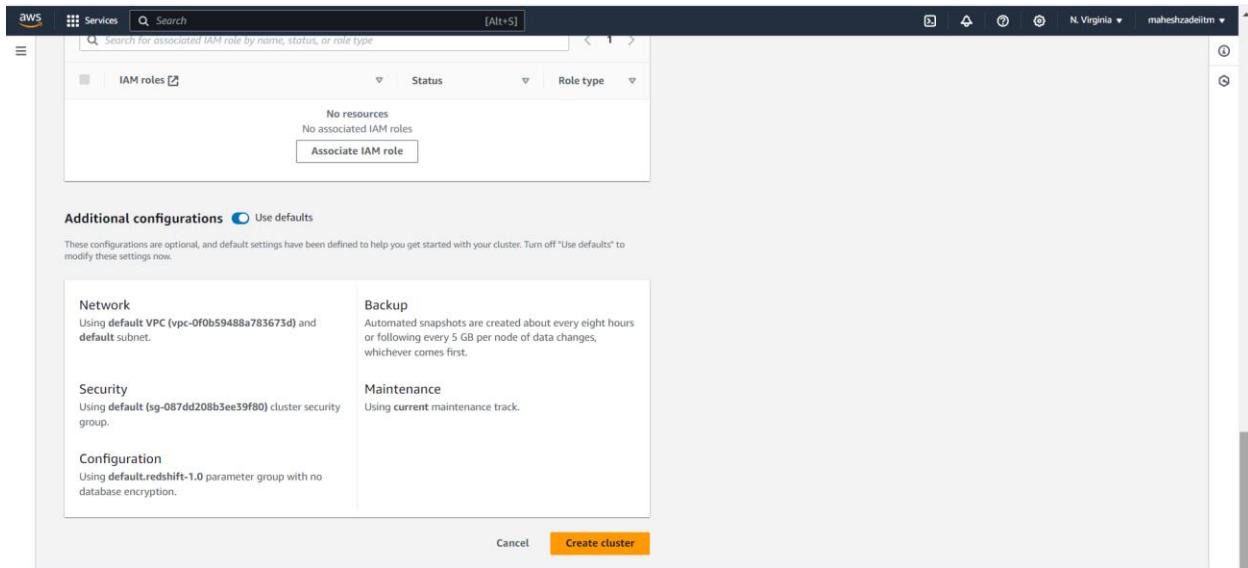
 Generate a password
Amazon Redshift generates an admin password.

 Manually add the admin password
Manually enter the admin password.

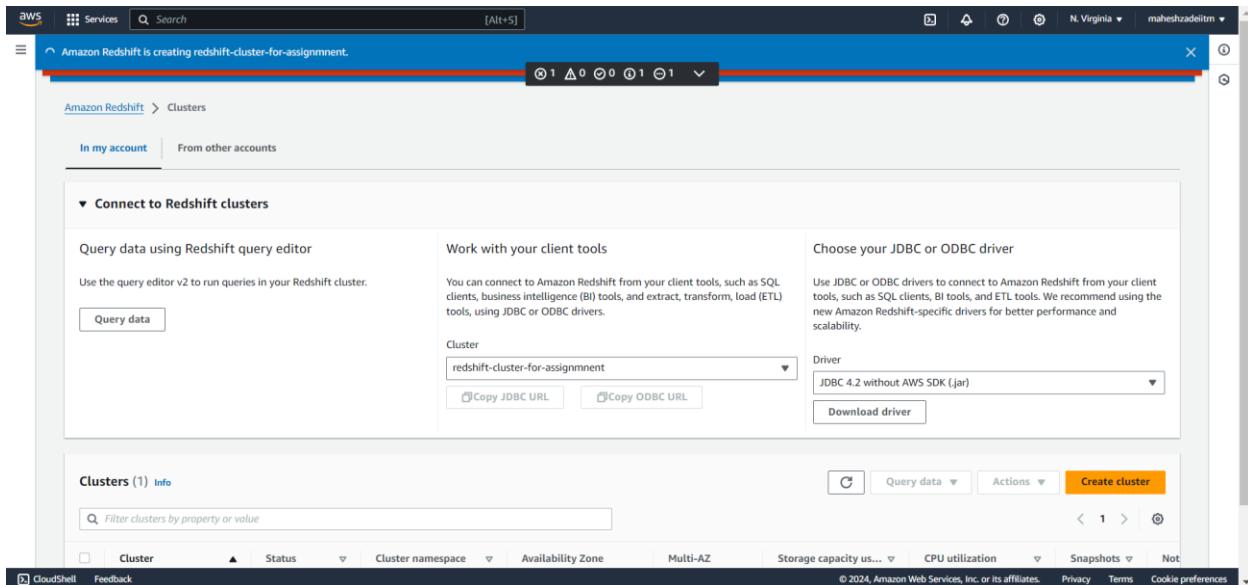
Admin user password

Must be 8-64 characters long. Must contain at least one uppercase letter, one lowercase letter and one number. Can be any printable ASCII character except "/", "\", or "@".
 Show password

Password is Admin12345678



Click on create cluster



Cluster got created. Let's open the query editor

The screenshot shows the AWS Redshift console. At the top, there's a navigation bar with tabs for 'In my account' and 'From other accounts'. Below this, under 'Connect to Redshift clusters', there are three main sections: 'Query data using Redshift query editor' (with a 'Query data' button), 'Work with your client tools' (describing how to connect using various tools like SQL clients, BI tools, and ETL tools), and 'Choose your JDBC or ODBC driver' (listing the JDBC 4.2 driver). Below these sections is a table titled 'Clusters (1/1) Info' showing one cluster named 'redshift-cluster-for-assignment'.

This screenshot shows the 'Redshift query editor v2' interface. On the left, there's a sidebar with options like 'Editor', 'Queries', 'Notebooks', 'Charts', 'History', 'Scheduled queries', 'CloudShell', and 'Feedback'. The main area shows a query editor tab titled 'Untitled 1'. A modal window titled 'Connect to redshift-cluster-for-assignment' is open, displaying a message about the new generative SQL functionality and asking the administrator to activate it. It then lists several connection methods: 'Federated user' (selected), 'Temporary credentials using a database user name', 'Temporary credentials using your IAM identity', 'Database user name and password', and 'AWS Secrets Manager'. Below these, there are fields for 'Database' (set to 'dev') and 'User name'. A warning message states: 'The RedshiftDbUser principal tag is required for a federated user connection.' At the bottom of the modal are 'Cancel' and 'Create connection' buttons.

This page will be opened.

Choose temporary credentials and enter the username chosen in the previous step

Let's create a csv file and upload it to s3.

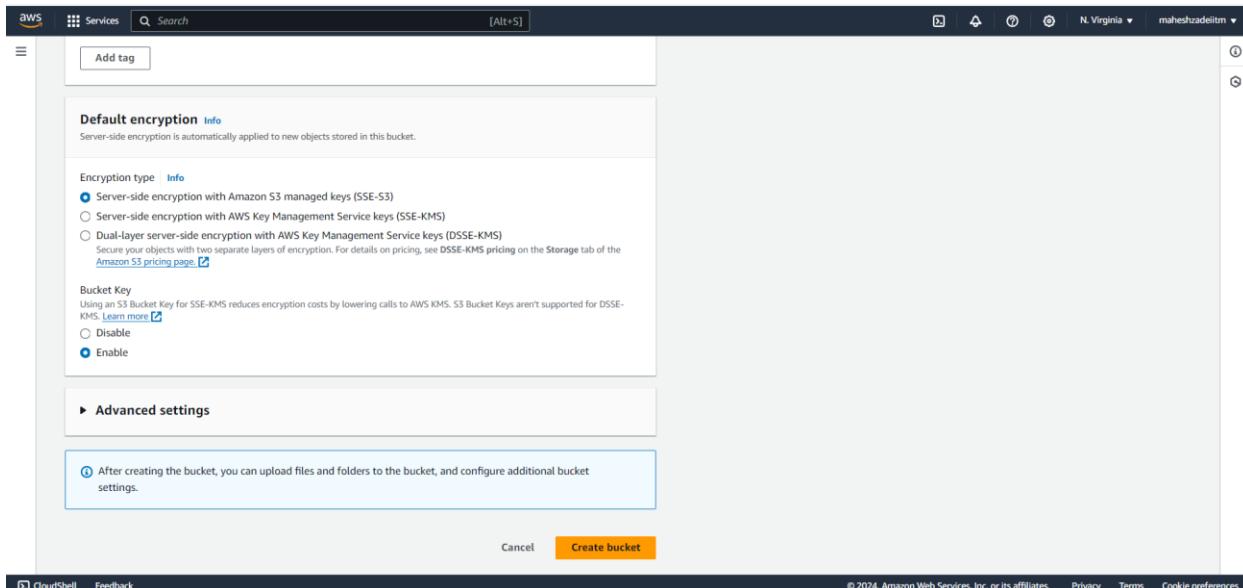
	A	B	C	D	E
1	id	name	age		
2		1 mahesh	50		
3		2 vimal	26		
4		3 nishchitha	24		
5		4 hiral	28		
6					
7					



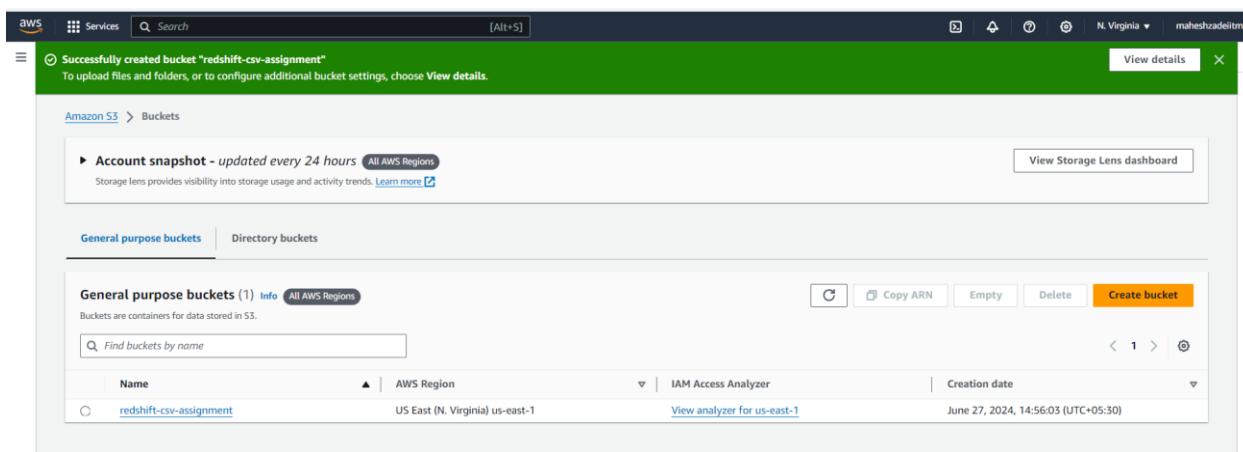
Create bucket

The screenshot shows the AWS S3 'Create bucket' interface. At the top, there's a navigation bar with the AWS logo, 'Services' dropdown, search bar, and a 'Create bucket' button. The main title is 'Create bucket' with an 'Info' link. Below it, a sub-header says 'Buckets are containers for data stored in S3.' A 'General configuration' section contains fields for 'AWS Region' (set to 'US East (N. Virginia) us-east-1') and 'Bucket type' (with 'General purpose' selected). There are two options: 'General purpose' (selected) and 'Directory - New'. The 'Bucket name' field is filled with 'redshift-csv-assignment'. Below this, a note states that the bucket name must be unique and follow naming rules, with a link to 'See rules for bucket naming'. A 'Copy settings from existing bucket - optional' section is present, and a 'Choose bucket' button is available. The bottom of the form includes a note about prefix format: 'Format: s3://bucket/prefix'.

And upload the csv file in it.



Bucket created



CSV file uploaded

The screenshot shows the AWS S3 console with a green header bar indicating a successful upload. The main area displays a summary of the upload, showing 1 file (redshiftdata.csv) successfully uploaded to the destination s3://redshift-csv-assignment. Below this, there are tabs for 'Files and folders' and 'Configuration'. Under 'Files and folders', a table lists the uploaded file: redshiftdata.csv, which is a text/csv file of size 63.0 B and status Succeeded.

Let's go to IAM and create a new role with permissions to access S3 and then Attach the role to our Redshift cluster

The screenshot shows the AWS IAM Role creation wizard at Step 2: Trusted entity type. It lists four options: AWS service (selected), AWS account, SAML 2.0 federation, and Custom trust policy. Below this, the Use case section shows S3 selected as the service or use case. At the bottom right, there are 'Cancel' and 'Next Step' buttons.

Add permissions

Permissions policies (1/942) [Info](#)

Choose one or more policies to attach to your new role.

Policy name	Type	Description
<input type="checkbox"/> AmazonDMSRedshiftS3Role	AWS managed	Provides access to manage S3 settings...
<input checked="" type="checkbox"/> AmazonS3FullAccess	AWS managed	Provides full access to all buckets via t...
<input type="checkbox"/> AmazonS3ObjectLambdaExecutionRolePolicy	AWS managed	Provides AWS Lambda functions permis...
<input type="checkbox"/> AmazonS3OutpostsFullAccess	AWS managed	Provides full access to Amazon S3 on ...
<input type="checkbox"/> AmazonS3ReadOnlyAccess	AWS managed	Provides read only access to Amazon S...
<input type="checkbox"/> AmazonS3ReadonlyAccess	AWS managed	Provides read only access to all bucket...
<input type="checkbox"/> AWSBackupServiceRolePolicyForS3Backup	AWS managed	Policy containing permissions necessar...
<input type="checkbox"/> AWSBackupServiceRolePolicyForS3Restore	AWS managed	Policy containing permissions necessar...
<input type="checkbox"/> QuickSightAccessForS3StorageManagementAnalytic...	AWS managed	Policy used by QuickSight team to acc...

Role details

Role name
redshiffor3

Description
Allows S3 to call AWS services on your behalf.

Step 1: Select trusted entities

Trust policy

```

1 - [
2   "Version": "2012-10-17",
3   "Statement": [
4     {
5       "Effect": "Allow",
6       "Principal": {
7         "Service": "s3.amazonaws.com"
8       },
9       "Action": "sts:AssumeRole"
10      }
11    ]
12 ]

```

Step 2: Add permissions

Step 2: Add permissions

Policy name	Type	Attached as
AmazonS3FullAccess	AWS managed	Permissions policy

Step 3: Add tags

Add tags - optional info
Tags are key-value pairs that you can add to AWS resources to help identify, organize, or search for resources.

No tags associated with the resource.

Add new tag
You can add up to 50 more tags.

Cancel Previous Create role

Click on create role

Identity and Access Management (IAM)

Role redshiftfor3 created.

IAM > Roles

Roles (33) Info

An IAM role is an identity you can create that has specific permissions with credentials that are valid for short durations. Roles can be assumed by entities that you trust.

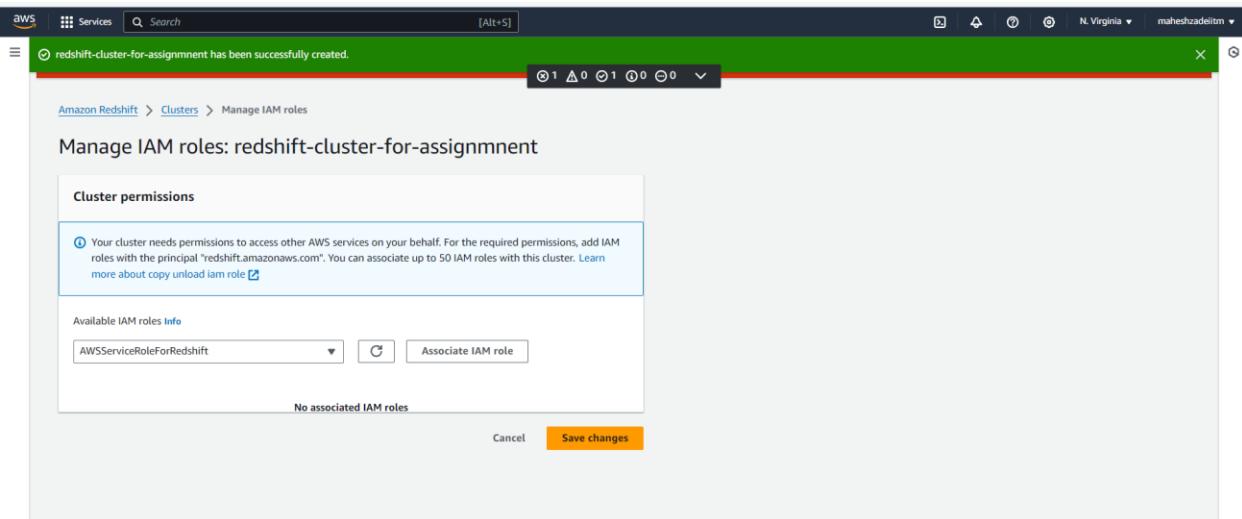
Role name	Trusted entities	Last activity
AmazonSSMRoleForInstancesQuickSetup	AWS Service: ec2	150 days ago
aws-elasticbeanstalk-service-role	AWS Service: elasticbeanstalk	52 days ago
AWS-QuickSetup-HostMgmtRole-ap-south-1-qmhkv	AWS Service: ssm	150 days ago
AWS-QuickSetup-HostMgmtRole-us-east-1-jws6t	AWS Service: ssm	157 days ago
AWS-QuickSetup-StackSet-Local-AdministrationRole	AWS Service: cloudformation	150 days ago
AWS-QuickSetup-StackSet-Local-ExecutionRole	Account: 058264440832	150 days ago
AWSBackupDefaultServiceRole	AWS Service: backup	26 days ago
AWSElasticBeanstalkRole	AWS Service: ec2	52 days ago
AWSElasticBeanstalkRole1	AWS Service: ec2	51 days ago
AWSServiceRoleForAmazonElasticFileSystem	AWS Service: elasticfilesystem (Service-Linked Role)	28 days ago
AWSServiceRoleForAmazonFSx	AWS Service: fsx (Service-Linked Role)	66 days ago

The screenshot shows the AWS IAM Roles page. A search bar at the top left contains the text 'reds'. Below it, a table lists roles, with one row highlighted: 'AWSServiceRoleForRedshift'. The table includes columns for 'Role name', 'Trusted entities', and 'Last activity'. At the bottom of the table, it says 'AWS Service: redshift (Service-Linked) 25 minutes ago'. To the right of the table, there are three cards: 'Access AWS from your non AWS workloads', 'X.509 Standard', and 'Temporary credentials'.

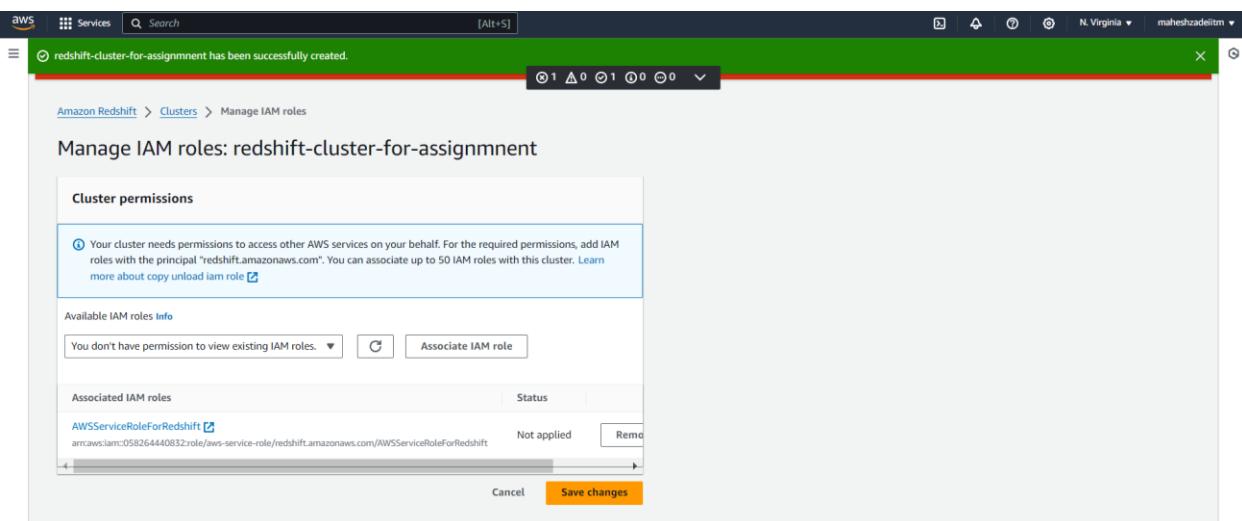
Created a role for Redshift to access S3. Let's Attach it to our Redshift cluster.

Choose the cluster → Actions → Manage IAM roles

The screenshot shows the AWS Redshift Clusters page. In the top right corner, a context menu is open with the 'Manage IAM roles' option highlighted. The main table displays a single cluster named 'redshift-cluster-for-assignment'. The table has columns for Cluster, Status, Cluster namespace, Availability Zone, Multi-AZ, Storage capacity us..., CPU utilization, and Snapshots.



click on Associate and Save.



The changes to the attached cluster IAM roles are applied.

Amazon Redshift > Clusters > redshift-cluster-for-assignment

redshift-cluster-for-assignment

General information [Info](#)

Cluster identifier redshift-cluster-for-assignment	Status Modifying	Node type ra3.xlplus	Endpoint redshift-cluster-for-assignment.cjn2ufwpsjj.us-east-1.redshift.amazonaws.com:5439/dev
Custom domain name -	Date created June 27, 2024, 14:46 (UTC+05:30)	Number of nodes 2	JDBC URL jdbc:redshift://redshift-cluster-for-assignment.cjn2ufwpsjj.us-east-1.redshift.amazonaws.com:5439/dev
Cluster namespace ARN arnaws:redshift:us-east-1:05826440832:namespace:9043cd76-a50a-4ede-99cf-295073b99870	Storage used -	Patch version Patch 181 Patch	ODBC URL Driver=(Amazon Redshift (x64)); Server=redshift-cluster-for-assignment.cjn2ufwpsjj.us-east-1.redshift.amazonaws.com; Database=dev
Cluster configuration Production	Multi-AZ No		

[Actions](#) [Edit](#) [Add partner integration](#) [Query data](#)

Cluster performance | Query monitoring | Databases | DataShares | Zero-ETL integrations | Resource Policy | Schedules | Maintenance | Properties

▶ Recommendations (0)

In imminent maintenance and database connection errors, Amazon Redshift Advisor provides recommendations.

aws Services Search [Alt+S]

Redshift query editor v2

Editor Queries Notebooks Charts History Scheduled queries CloudShell Feedback

Untitled 1 × [Create](#) [Load data](#) [Run](#) [Limit 100](#) Filter resources [Settings](#)

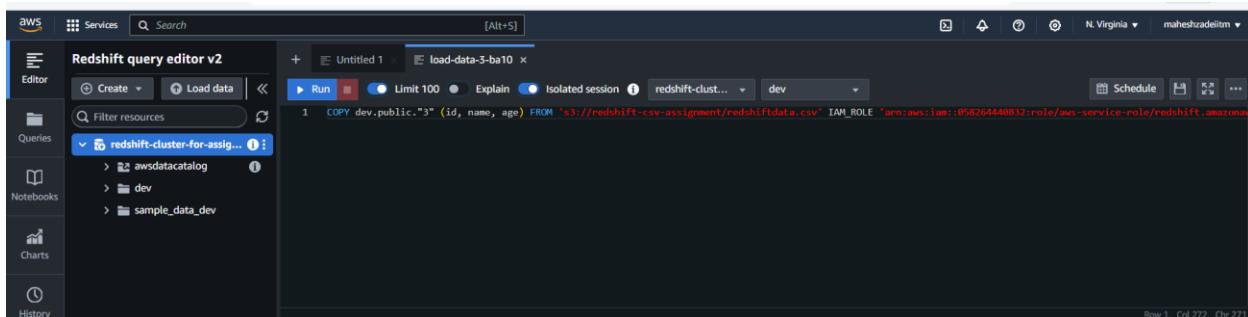
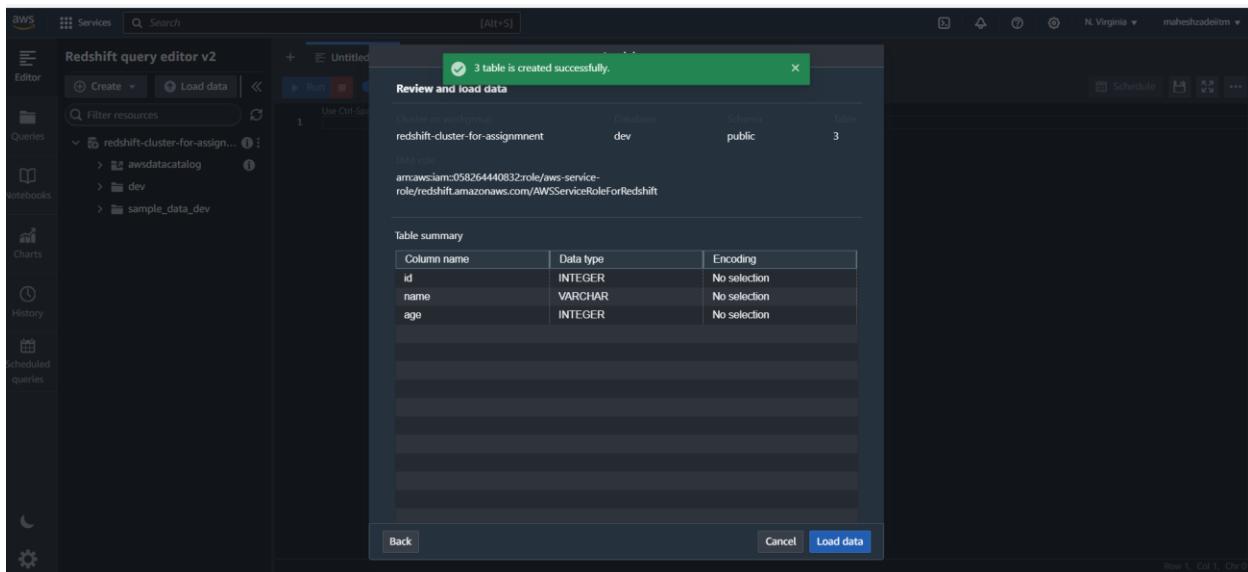
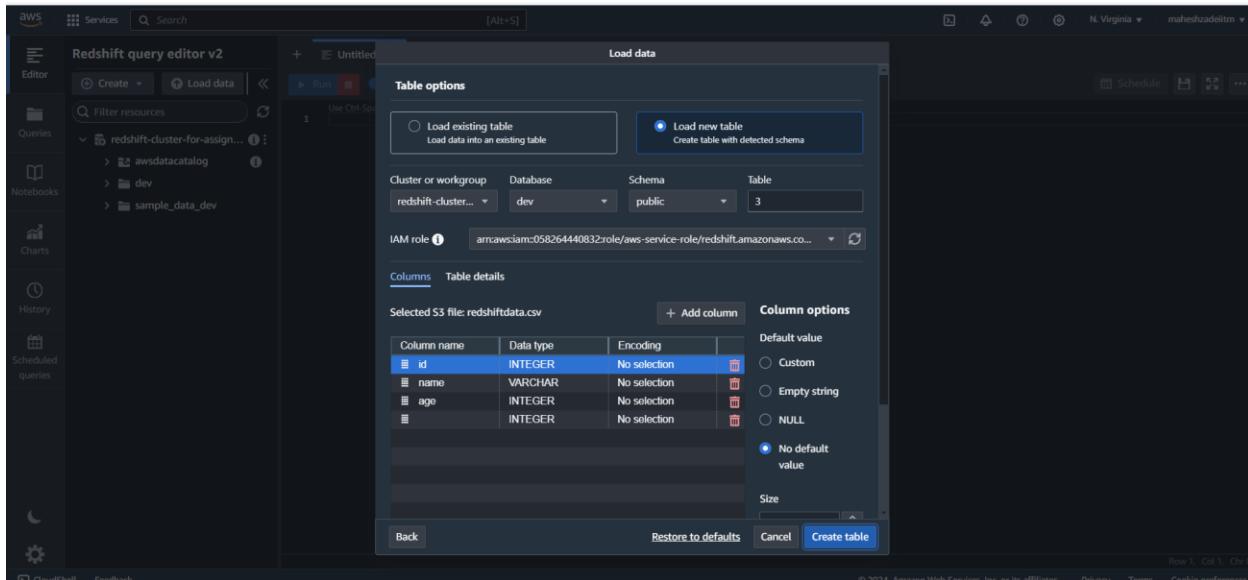
redshift-cluster-for-assig... [awsdatacatalog](#) [dev](#) [sample_data_dev](#)

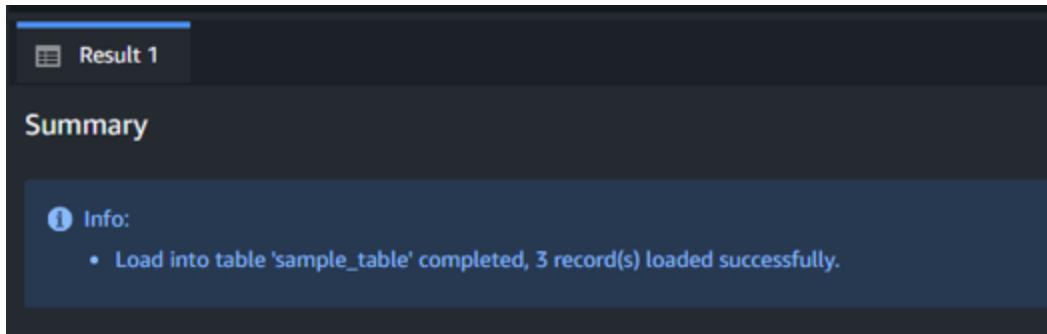
Amazon Redshift Query editor V2 now supports generative SQL functionality. Contact your administrator to activate this feature in [Settings](#)

Use Ctrl+Space for autocomplete

Row 1, Col 1, Chr 0

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The screenshot shows a terminal window titled "Result 1". Under the "Summary" section, there is an "Info:" message with a list item: "Load into table 'sample_table' completed, 3 record(s) loaded successfully."

This completes our assignment.

Summary

- Created a MariaDB RDS Database.
 - Connected to the DB using SQL Client on Windows.
 - Connected to the DB using a Linux-Based EC2 Instance.
 - Created an AuroraDB database
 - Created 2 read replicas in different AZs.
- Created a DynamoDB table
 - Added 5 items into this table.
 - Created backup of this table and deleted it.
- Created a Redshift data warehouse
 - Created a cluster
 - Executed sql queries for create table
 - Created an IAM role for redshift to access S3.
 - Uploaded a csv file to s3 bucket and copied csv data to the above table
 - Then executed sql query to verify the data loading.

Thank You

