



UNIVERSITI TUNKU ABDUL RAHMAN

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FACULTY OF INFORMATION AND COMMUNICATION
TECHNOLOGY

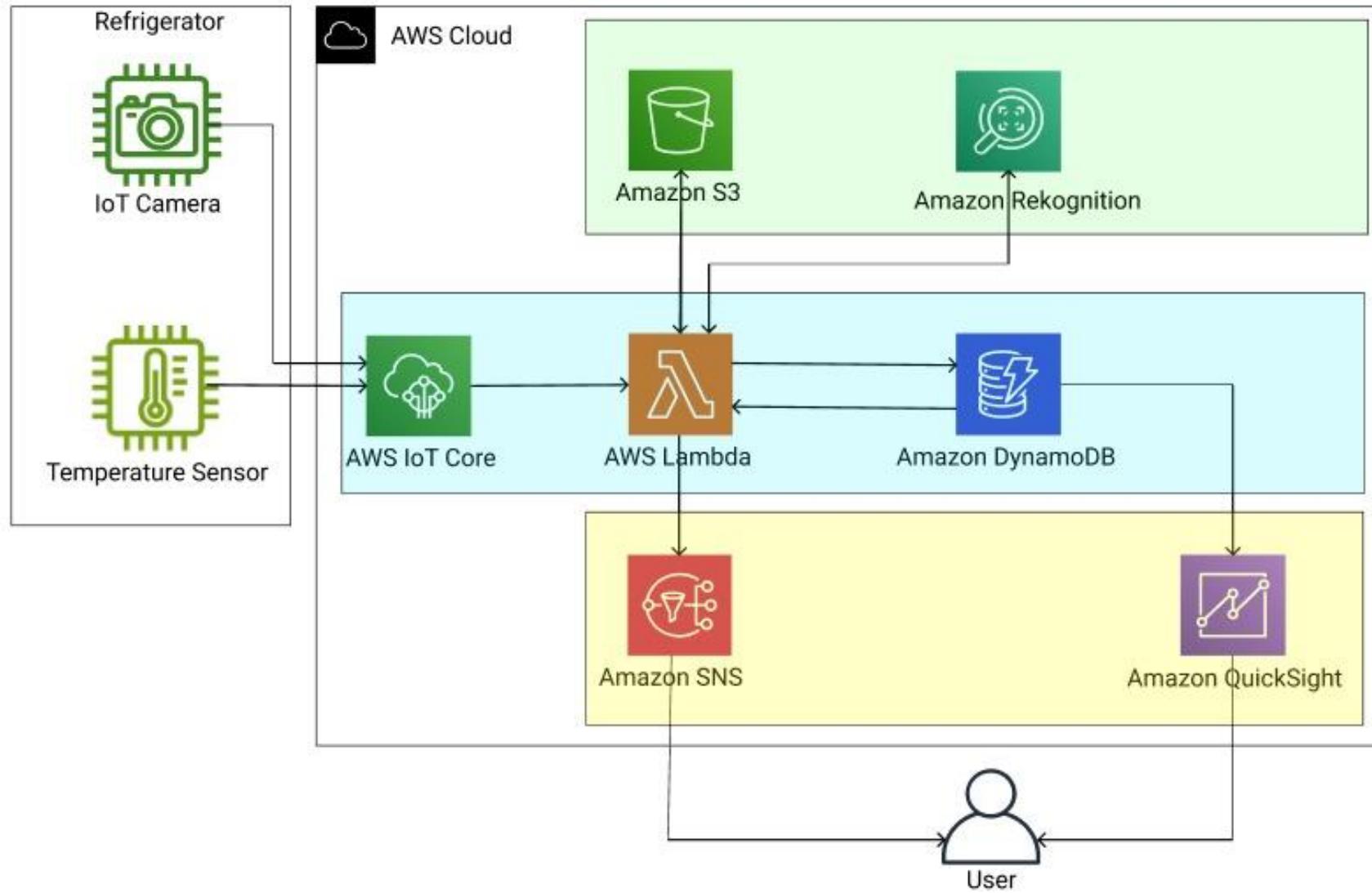
UCCD3113 DISTRIBUTED COMPUTER SYSTEMS

Topic: Smart Food Waste Management System

Name	Student ID	Course
Bryan Ng Jing Hong	21ACB04145	CS
Heah Jun Bin	21ACB03101	CS
Heng Thee Yong	21ACB05427	CS
Tan Wei Jian	22ACB07654	CS

AWS Architecture Diagram

Smart Food Waste Management System



Amazon Simple Storage Service (S3)

Function : Store raw images of food items.

Step 1: Search for “Amazon S3” in the search bar.

The screenshot shows the AWS search interface with the search term "s3" entered in the search bar. The results are categorized under "Services" and "Features".

Services

- S3** Scalable Storage in the Cloud (highlighted with a red arrow)
- S3 Glacier** Archive Storage in the Cloud
- AWS Snow Family** Large Scale Data Transport

Features

- Imports from S3**
 - DynamoDB feature
- Feature spotlight**
 - S3 feature
- S3 Access Grants**
 - S3 feature

At the bottom, there are buttons for "Were these results helpful?" with "Yes" and "No" options, and copyright information: © 2025, Amazon.com, Inc. or its affiliates.

Step 2: Click on the “Create bucket” to create a bucket.

The screenshot shows the Amazon S3 landing page. On the left, there's a navigation sidebar with links like "General purpose buckets", "Storage Lens", and "Feature spotlight". The main content area features a large "Amazon S3" logo and the tagline "Store and retrieve any amount of data from anywhere". Below this, there's a brief description of Amazon S3 and a "Create a bucket" button, which is highlighted with a red arrow. To the right of the button is a "Pricing" section and a "Resources" section. At the bottom, there are links for "CloudShell", "Feedback", and copyright information.

aws | Search [Alt+S]

Amazon S3

General purpose buckets

Directory buckets

Table buckets

Access Grants

Access Points

Object Lambda Access Points

Multi-Region Access Points

Batch Operations

IAM Access Analyzer for S3

Block Public Access settings for this account

▼ Storage Lens

Dashboards

Storage Lens groups

AWS Organizations settings

Feature spotlight 11

Storage

Amazon S3

Store and retrieve any amount of data from anywhere

Amazon S3 is an object storage service that offers industry-leading scalability, data availability, security, and performance.

Create a bucket

Every object in S3 is stored in a bucket. To upload files and folders to S3, you'll need to create a bucket where the objects will be stored.

Create bucket

Pricing

With S3, there are no minimum fees. You only pay for what you use. Prices are based on the location of your S3 bucket.

Estimate your monthly bill using the [AWS Simple Monthly Calculator](#)

[View pricing details](#)

Resources

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Step 3: Enter name for the bucket.

The screenshot shows the AWS S3 'Create bucket' interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'Amazon S3 > Buckets > Create bucket'. The main content area is titled 'Create bucket' with an 'Info' link. A sub-section titled 'Buckets are containers for data stored in S3.' follows. The 'General configuration' section is highlighted with a blue border. It contains fields for 'AWS Region' (set to 'Asia Pacific (Singapore) ap-southeast-1') and 'Bucket type'. Under 'Bucket type', the 'General purpose' option is selected (indicated by a blue outline and a checked radio button). A tooltip for this option states: 'Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.' Next to it is the 'Directory' option, which is not selected. A tooltip for 'Directory' states: 'Recommended for specialized low-latency use cases supported by AWS Availability Zones or data residency use cases supported by AWS Local Zones.' Below this, the 'Bucket name' field is populated with 'custom-labels-console-ap-southeast-1-f84c5ac0ed1', with a red arrow pointing to the input field. A tooltip for the bucket name field specifies: 'Bucket names must be 3 to 63 characters and unique within the global namespace. Bucket names must also begin and end with a letter or number. Valid characters are a-z, 0-9, periods (.), and hyphens (-). Learn More' with a link icon. The 'Copy settings from existing bucket - optional' section includes a 'Choose bucket' button and a note about copied settings. The 'Object Ownership' section controls object ownership and access control lists (ACLs). The bottom of the page includes standard AWS footer links: CloudShell, Feedback, Copyright notice (© 2025, Amazon Web Services, Inc. or its affiliates.), Privacy, Terms, and Cookie preferences.

Step 4: Scroll to the bottom and click on the “Create bucket”.

The screenshot shows the 'Create bucket' configuration page in the AWS S3 console. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'Amazon S3 > Buckets > Create bucket'. A blue button labeled 'Add tag' is visible. The main form contains several sections:

- Default encryption**: Info link. Description: Server-side encryption is automatically applied to new objects stored in this bucket.
 - Encryption type**: Info link. Options:
 - Server-side encryption with Amazon S3 managed keys (SSE-S3)
 - Server-side encryption with AWS Key Management Service keys (SSE-KMS)
 - Dual-layer server-side encryption with AWS Key Management Service keys (DSSE-KMS)
 - Secure your objects with two separate layers of encryption. For details on pricing, see [DSSE-KMS pricing](#) on the Storage tab of the [Amazon S3 pricing page](#).
 - Bucket Key**: Description: Using an S3 Bucket Key for SSE-KMS reduces encryption costs by lowering calls to AWS KMS. S3 Bucket Keys aren't supported for DSSE-KMS. [Learn more](#).
 - Disable
 - Enable

Advanced settings

Info: After creating the bucket, you can upload files and folders to the bucket, and configure additional bucket settings.

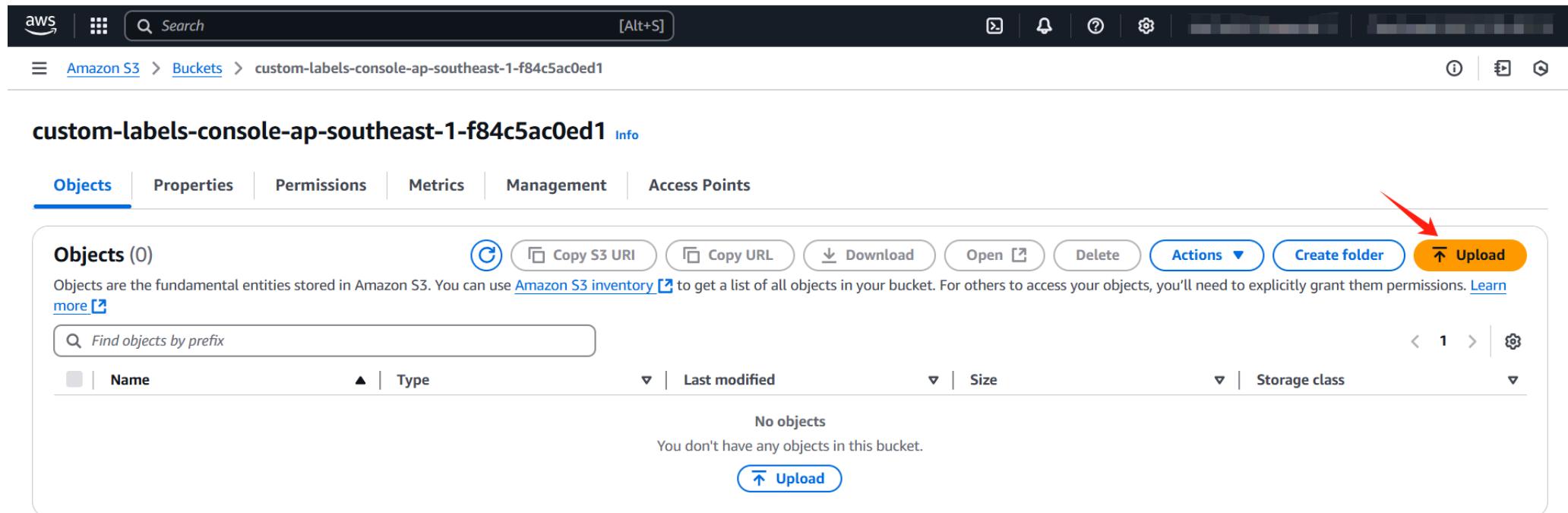
At the bottom right, there are 'Cancel' and 'Create bucket' buttons. An orange arrow points to the 'Create bucket' button.

Step 5: Click on the created bucket.

The screenshot shows the AWS S3 Buckets page. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'Amazon S3 > Buckets'. A banner at the top says 'Account snapshot - updated every 24 hours' and 'All AWS Regions'. To the right of the banner is a 'View Storage Lens dashboard' button. The main content area has two tabs: 'General purpose buckets' (which is selected) and 'Directory buckets'. Below the tabs, a sub-header says 'General purpose buckets (4)' with 'Info' and 'All AWS Regions' buttons. A note states 'Buckets are containers for data stored in S3.' There's a search bar labeled 'Find buckets by name'. To the right of the search bar are buttons for 'Copy ARN', 'Empty', 'Delete', and 'Create bucket'. Below these buttons are navigation arrows and a settings icon. The main table lists four buckets:

Name	AWS Region	IAM Access Analyzer	Creation date
custom-labels-console-ap-southeast-1-f84c5ac0ed	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 17:04:55 (UTC+08:00)
custom-labels-console-ap-southeast-1-f84c5ac0ed	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 20:14:44 (UTC+08:00)
sagemaker-ap-southeast-1-346701284971	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 13:41:08 (UTC+08:00)
sagemaker-studio-346701284971-da70agu6m5s	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 13:41:05 (UTC+08:00)

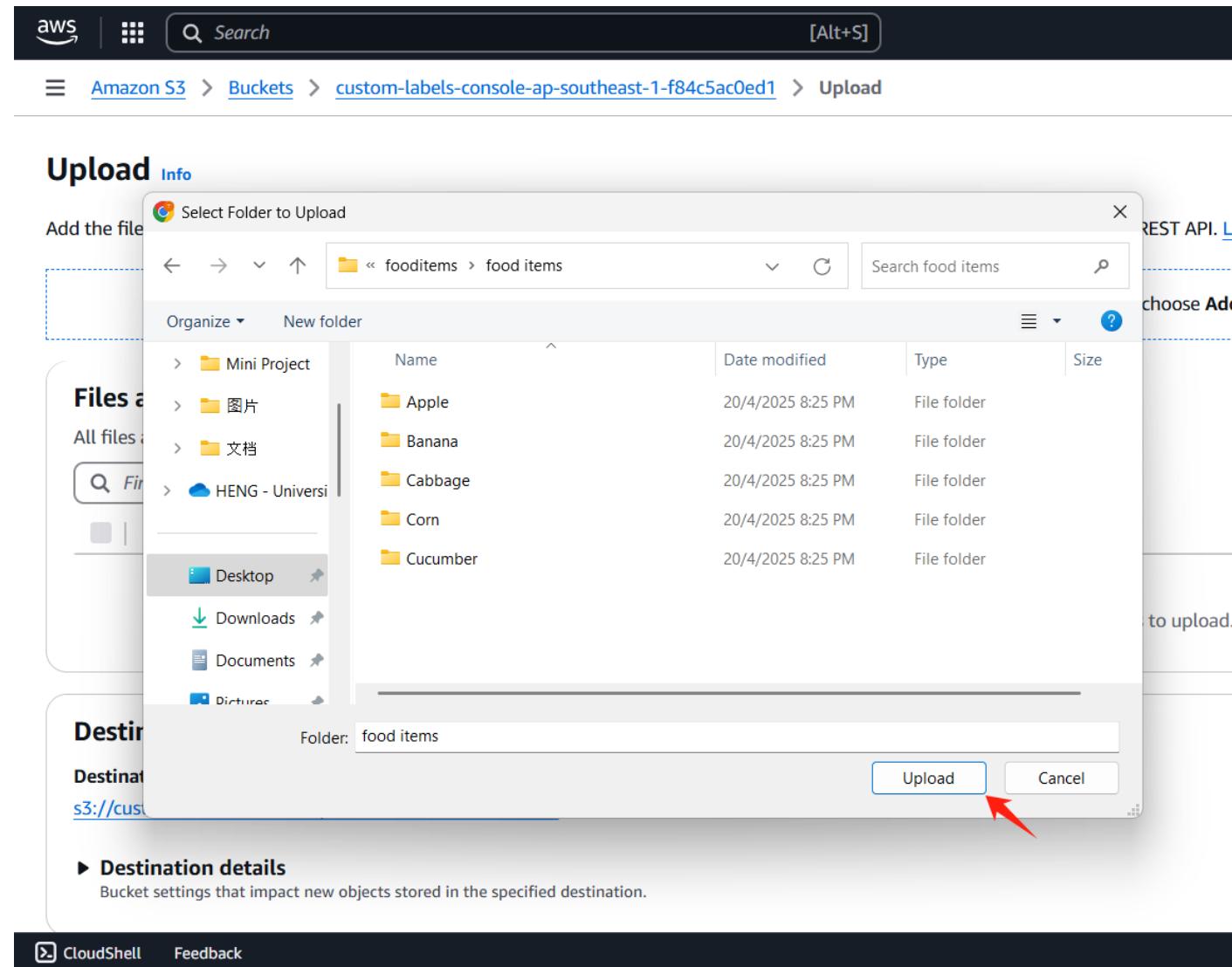
Step 6: Click on the “Upload”.



Step 7: Click on the “Add folder”.

The screenshot shows the AWS S3 "Upload" interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows: Amazon S3 > Buckets > custom-labels-console-ap-southeast-1-f84c5ac0ed1 > Upload. On the left, there's a sidebar with "Upload" and "Info" tabs. The main area has a large dashed box for dragging files or folders, with the placeholder text "Drag and drop files and folders you want to upload here, or choose Add files or Add folder.". Below this is a table titled "Files and folders (0)" with columns for Name, Folder, Type, and Size. A search bar labeled "Find by name" is at the top of the table. To the right of the table are three buttons: "Remove", "Add files", and "Add folder". The "Add folder" button is highlighted with a red arrow pointing to it. At the bottom, there's a section titled "Destination" with a "Destination" field containing "s3://custom-labels-console-ap-southeast-1-f84c5ac0ed1" and a "Destination details" link. The footer includes links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences, along with a copyright notice for 2025, Amazon Web Services, Inc. or its affiliates.

Step 8: Select the folders containing images and click “Upload”



Step 9: Click on the “Upload” at the bottom of the page.

The screenshot shows the AWS S3 'Upload' interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'Amazon S3 > Buckets > custom-labels-console-ap-southeast-1-f84c5ac0ed1 > Upload'. On the left, a sidebar lists 'Destination' settings, including the destination URL 's3://custom-labels-console-ap-southeast-1-f84c5ac0ed1'. The main area displays a table titled 'Files and folders (300 total, 185.1 MB)' with columns for Name, Folder, Type, and Size. Two files are listed: 'Cucumber_1.jpg' and 'Cucumber_18.jpg'. At the bottom right, there are buttons for 'Cancel' and 'Upload', with a red arrow pointing to the 'Upload' button.

Name	Folder	Type	Size
Cucumber_1.jpg	root items/Cucumber/	image/jpeg	295.1 KB
Cucumber_18.jpg	food items/Cucumber/	image/jpeg	84.2 KB

Destination Info

Destination
<s3://custom-labels-console-ap-southeast-1-f84c5ac0ed1>

▶ **Destination details**
Bucket settings that impact new objects stored in the specified destination.

▶ **Permissions**
Grant public access and access to other AWS accounts.

▶ **Properties**
Specify storage class, encryption settings, tags, and more.

Cancel **Upload**

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Step 10: A bucket containing the images of food items have been created successfully and then click on the “Permissions” tab.

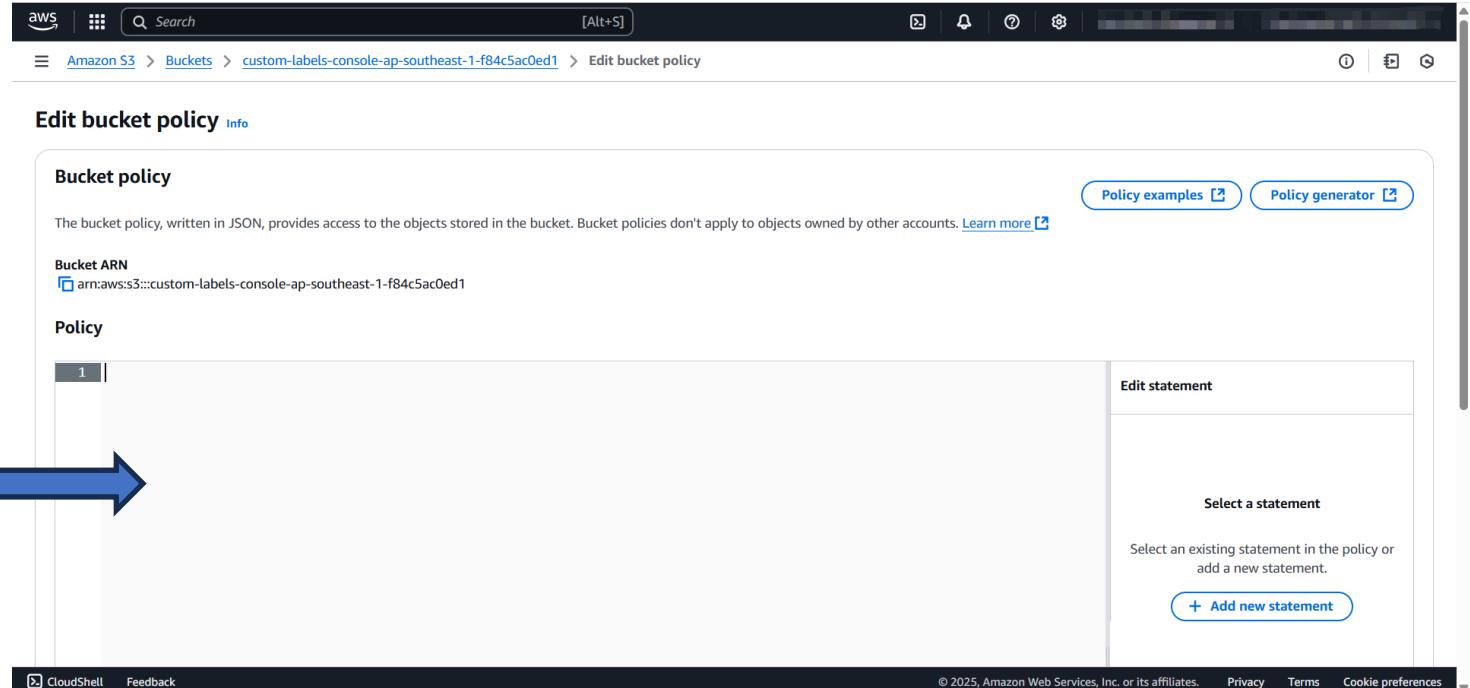
The screenshot shows the AWS S3 console interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'Amazon S3 > Buckets > custom-labels-console-ap-southeast-1-f84c5ac0ed1'. On the right side of the header are additional icons for information, export, and refresh. The main content area is titled 'custom-labels-console-ap-southeast-1-f84c5ac0ed1' with a 'Info' link. Below the title, there are tabs: 'Objects' (which is underlined in blue), 'Properties', 'Permissions' (which has a red arrow pointing to it), 'Metrics', 'Management', and 'Access Points'. Under the 'Objects' tab, there's a section titled 'Objects (1)'. It contains a table with one item: 'food items/' which is a 'Folder'. To the right of the table are several actions: 'Copy S3 URI', 'Copy URL', 'Download', 'Open', 'Delete', 'Actions', 'Create folder', and 'Upload'. Below the table is a search bar with the placeholder 'Find objects by prefix' and some pagination controls ('< 1 >'). At the bottom of the page, there are links for 'CloudShell', 'Feedback', '© 2025, Amazon Web Services, Inc. or its affiliates.', 'Privacy', 'Terms', and 'Cookie preferences'.

Step 11: Scrolls down to Bucket policy and click on the “Edit” button.

The screenshot shows the AWS S3 Bucket policy page for a bucket named "custom-labels-console-ap-southeast-1-f84c5ac0ed1". The top navigation bar includes the AWS logo, search bar, and account information ("TheeYong @ 3467-0128-4971"). The main content area is titled "Bucket policy" and contains a message stating that the bucket policy, written in JSON, provides access to the objects stored in the bucket. It notes that bucket policies don't apply to objects owned by other accounts and provides a link to "Learn more". A callout box highlights a warning: "Public access is blocked because Block Public Access settings are turned on for this bucket", with a sub-note about checking Block Public Access settings and a link to "using Amazon S3 Block Public Access". Below this, a message states "No policy to display." with a "Copy" button. The top right of the page has "Edit" and "Delete" buttons, with the "Edit" button being highlighted by a red arrow.

Step 12: Paste the provided policy below into the “Policy” section.

```
1 * {
2     "Version": "2012-10-17",
3     "Statement": [
4         {
5             "Sid": "AWSRekognitionS3AclBucketRead20191011",
6             "Effect": "Allow",
7             "Principal": {
8                 "Service": "rekognition.amazonaws.com"
9             },
10            "Action": [
11                "s3:GetBucketAcl",
12                "s3:GetBucketLocation"
13            ],
14            "Resource": "arn:aws:s3:::custom-labels-console-ap-southeast-1-f84c5ac0ed1"
15        },
16        {
17             "Sid": "AWSRekognitionS3GetBucket20191011",
18             "Effect": "Allow",
19             "Principal": {
20                 "Service": "rekognition.amazonaws.com"
21             },
22             "Action": [
23                 "s3:GetObject",
24                 "s3:GetObjectacl",
25                 "s3:GetObjectVersion",
26                 "s3:GetObjectTagging"
27             ],
28             "Resource": "arn:aws:s3:::custom-labels-console-ap-southeast-1-f84c5ac0ed1/*"
29         },
30         {
31             "Sid": "AWSRekognitionS3ACLBucketWrite20191011",
32             "Effect": "Allow",
33             "Principal": {
34                 "Service": "rekognition.amazonaws.com"
35             },
36             "Action": "s3:GetBucketAcl",
37             "Resource": "arn:aws:s3:::custom-labels-console-ap-southeast-1-f84c5ac0ed1"
38         },
39         {
40             "Sid": "AWSRekognitionS3PutObject20191011",
41             "Effect": "Allow",
42             "Principal": {
43                 "Service": "rekognition.amazonaws.com"
44             },
45             "Action": "s3:PutObject",
46             "Resource": "arn:aws:s3:::custom-labels-console-ap-southeast-1-f84c5ac0ed1/*",
47             "Condition": {
48                 "StringEquals": {
49                     "s3:x-amz-acl": "bucket-owner-full-control"
50                 }
51             }
52         }
53     ]
54 }
```



Step 13: Scrolls down to bottom and click on the “Save changes” button.

The screenshot shows the AWS S3 Bucket Policy Editor. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the path is shown: Amazon S3 > Buckets > custom-labels-console-ap-southeast-1-f84c5ac0ed1 > Edit bucket policy. On the left, there's a sidebar with a '+ Add new statement' button. The main area is titled 'JSON Ln 54, Col 1'. Below that, there are status indicators: Security: 4, Errors: 0, Warnings: 0, and Suggestions: 0. To the right, there's a 'Preview external access' link. A modal window titled 'Learn more about policy validation' is open, listing four security warnings with links to learn more. The first warning is at Ln 8, Col 15, the second at Ln 20, Col 15, the third at Ln 34, Col 15, and the fourth at Ln 43, Col 15. At the bottom right of the page, there are 'Cancel' and 'Save changes' buttons, with a red arrow pointing to the 'Save changes' button.

aws | Search [Alt+S]

Amazon S3 > Buckets > custom-labels-console-ap-southeast-1-f84c5ac0ed1 > Edit bucket policy

+ Add new statement

JSON Ln 54, Col 1

Security: 4 Errors: 0 Warnings: 0 Suggestions: 0

Preview external access

Learn more about policy validation

Search security warnings

Ln 8, Col 15 Restrict Access To Service Principal: Granting access to a service principal without specifying a source is overly permissive. Use aws:SourceArn, aws:SourceAccount, aws:SourceOrgID, or aws:SourceOrgPaths condition key to grant fine-grained access. [Learn more](#)

Ln 20, Col 15 Restrict Access To Service Principal: Granting access to a service principal without specifying a source is overly permissive. Use aws:SourceArn, aws:SourceAccount, aws:SourceOrgID, or aws:SourceOrgPaths condition key to grant fine-grained access. [Learn more](#)

Ln 34, Col 15 Restrict Access To Service Principal: Granting access to a service principal without specifying a source is overly permissive. Use aws:SourceArn, aws:SourceAccount, aws:SourceOrgID, or aws:SourceOrgPaths condition key to grant fine-grained access. [Learn more](#)

Ln 43, Col 15 Restrict Access To Service Principal: Granting access to a service principal without specifying a source is overly permissive. Use aws:SourceArn, aws:SourceAccount, aws:SourceOrgID, or aws:SourceOrgPaths condition key to grant fine-grained access. [Learn more](#)

Cancel Save changes

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Step 14: Create another bucket to store the images for classification

The screenshot shows the AWS S3 'Create bucket' configuration page. The top navigation bar includes the AWS logo, search bar, and various icons. The breadcrumb path indicates the user is in the 'Amazon S3 > Buckets > Create bucket' section.

Create bucket Info
Buckets are containers for data stored in S3.

General configuration

AWS Region
Asia Pacific (Singapore) ap-southeast-1

Bucket type Info

General purpose
Recommended for most use cases and access patterns. General purpose buckets are the original S3 bucket type. They allow a mix of storage classes that redundantly store objects across multiple Availability Zones.

Directory
Recommended for specialized low-latency use cases supported by AWS Availability Zones or data residency use cases supported by AWS Local Zones.

Bucket name Info

classify-images-console-ap-southeast-1-f84c5ac0ed1

Bucket names must be 3 to 63 characters and unique within the global namespace. Bucket names must also begin and end with a letter or number. Valid characters are a-z, 0-9, periods (.), and hyphens (-). [Learn More](#)

Copy settings from existing bucket - optional
Only the bucket settings in the following configuration are copied.

Choose bucket

Format: s3://bucket/prefix

Object Ownership Info

Control ownership of objects written to this bucket from other AWS accounts and the use of access control lists (ACLs). Object ownership determines who can specify access to objects.

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Step 15: Click on the “Create bucket”.

The screenshot shows the 'Create bucket' wizard in the AWS S3 console. The top navigation bar includes the AWS logo, a search bar, and various navigation icons. The breadcrumb path indicates the user is at 'Amazon S3 > Buckets > Create bucket'. A blue 'Add tag' button is visible. The main configuration area starts with a 'Default encryption' section, which states that server-side encryption is automatically applied to new objects stored in this bucket. It offers three options: 'Server-side encryption with Amazon S3 managed keys (SSE-S3)' (selected), 'Server-side encryption with AWS Key Management Service keys (SSE-KMS)', and 'Dual-layer server-side encryption with AWS Key Management Service keys (DSSE-KMS)'. A note below explains that DSSE-KMS uses two separate layers of encryption and provides a link to the 'Amazon S3 pricing page'. The next section is 'Bucket Key', which notes that using an S3 Bucket Key for SSE-KMS reduces encryption costs by lowering calls to AWS KMS. It offers 'Disable' (unchecked) and 'Enable' (checked) options. Below this is a 'Advanced settings' section, indicated by a right-pointing arrow. A callout box contains the text: 'After creating the bucket, you can upload files and folders to the bucket, and configure additional bucket settings.' At the bottom right are 'Cancel' and 'Create bucket' buttons, with a red arrow pointing to the 'Create bucket' button.

aws | Search [Alt+S]

Amazon S3 > Buckets > Create bucket

Add tag

Default encryption [Info](#)

Server-side encryption is automatically applied to new objects stored in this bucket.

Encryption type [Info](#)

Server-side encryption with Amazon S3 managed keys (SSE-S3)
 Server-side encryption with AWS Key Management Service keys (SSE-KMS)
 Dual-layer server-side encryption with AWS Key Management Service keys (DSSE-KMS)

Secure your objects with two separate layers of encryption. For details on pricing, see [DSSE-KMS pricing](#) on the Storage tab of the [Amazon S3 pricing page](#).

Bucket Key

Using an S3 Bucket Key for SSE-KMS reduces encryption costs by lowering calls to AWS KMS. S3 Bucket Keys aren't supported for DSSE-KMS. [Learn more](#)

Disable
 Enable

▶ Advanced settings

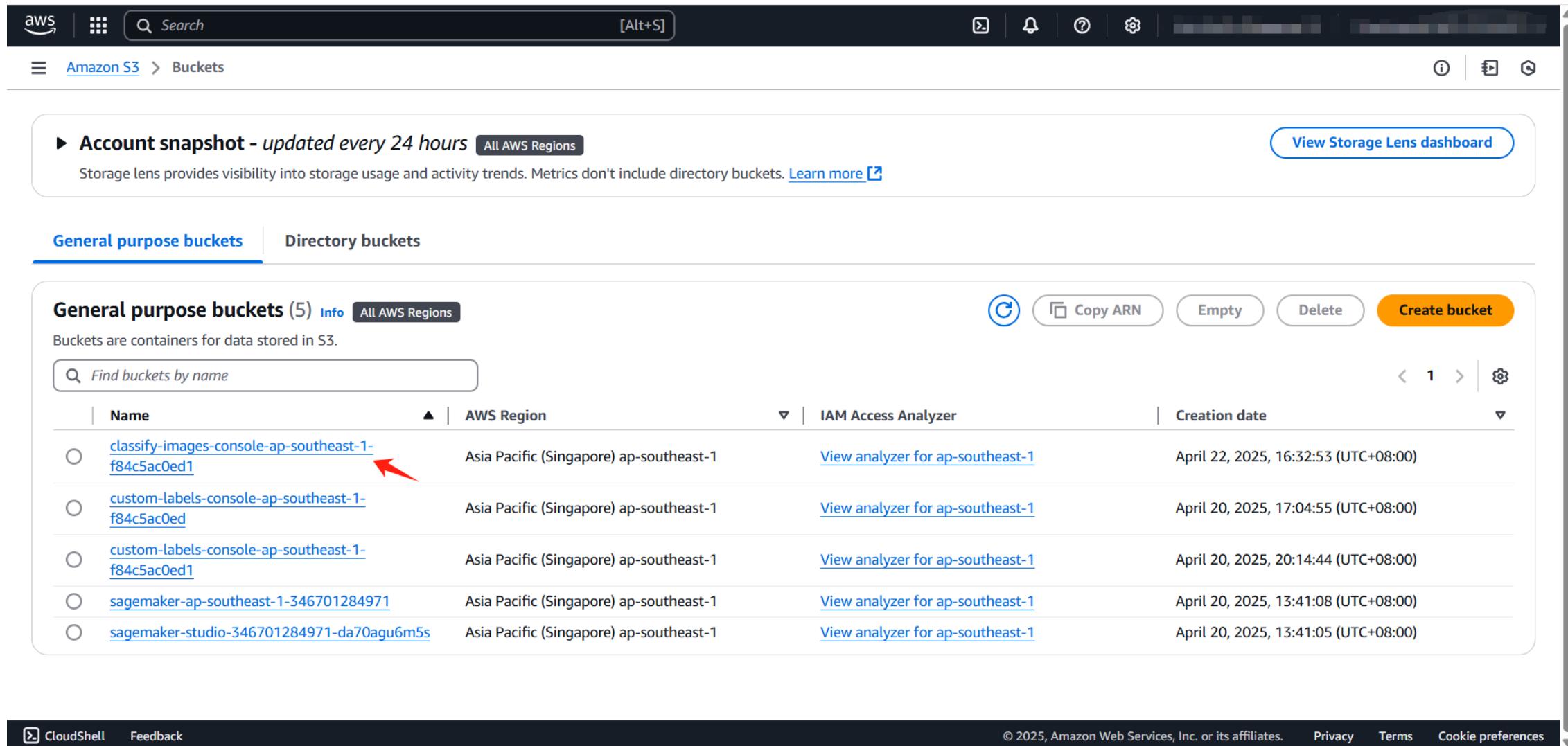
After creating the bucket, you can upload files and folders to the bucket, and configure additional bucket settings.

Create bucket

CloudShell Feedback

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Step 16: Click on the created bucket.



The screenshot shows the AWS S3 Buckets page. At the top, there's a search bar and a navigation bar with options like 'Amazon S3 > Buckets'. Below the navigation, there's an 'Account snapshot' section with a note about being updated every 24 hours and a link to 'View Storage Lens dashboard'. The main area is divided into 'General purpose buckets' and 'Directory buckets', with 'General purpose buckets' selected. It shows a list of 5 buckets:

Name	AWS Region	IAM Access Analyzer	Creation date
classify-images-console-ap-southeast-1-f84c5ac0ed1	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 22, 2025, 16:32:53 (UTC+08:00)
custom-labels-console-ap-southeast-1-f84c5ac0ed	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 17:04:55 (UTC+08:00)
custom-labels-console-ap-southeast-1-f84c5ac0ed1	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 20:14:44 (UTC+08:00)
sagemaker-ap-southeast-1-346701284971	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 13:41:08 (UTC+08:00)
sagemaker-studio-346701284971-da70agu6m5s	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 13:41:05 (UTC+08:00)

At the bottom of the page, there are links for 'CloudShell', 'Feedback', '© 2025, Amazon Web Services, Inc. or its affiliates.', 'Privacy', 'Terms', and 'Cookie preferences'.

Step 17: Click on “Upload” button.

The screenshot shows the AWS S3 console interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below the navigation bar, the path is shown as 'Amazon S3 > Buckets > classify-images-console-ap-southeast-1-f84c5ac0ed1'. The main title is 'classify-images-console-ap-southeast-1-f84c5ac0ed1' with an 'Info' link. Below the title, there are tabs for 'Objects' (which is selected), 'Properties', 'Permissions', 'Metrics', 'Management', and 'Access Points'. A red arrow points from the bottom right towards the 'Upload' button. The 'Objects' section shows 'Objects (0)' and a message: 'Objects are the fundamental entities stored in Amazon S3. You can use [Amazon S3 inventory](#) to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. [Learn more](#)'. There's a search bar labeled 'Find objects by prefix' and a table header with columns: Name, Type, Last modified, Size, and Storage class. The table body says 'No objects' and 'You don't have any objects in this bucket.' with a blue 'Upload' button.

Step 18: Click on the “Add folder”.

The screenshot shows the AWS S3 "Upload" interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows: Amazon S3 > Buckets > classify-images-console-ap-southeast-1-f84c5ac0ed1 > Upload. On the left, there's a sidebar with "Upload" and "Info" buttons. The main area has a large central box with a dashed border, containing the text "Drag and drop files and folders you want to upload here, or choose Add files or Add folder." Below this is a table titled "Files and folders (0)" with columns for Name, Folder, Type, and Size. There are buttons for "Remove", "Add files" (which is highlighted with a blue border), and "Add folder". A red arrow points to the "Add folder" button. To the right of the table are navigation arrows (<, 1, >) and dropdown menus. At the bottom, there's a section for "Destination" with a link to "s3://classify-images-console-ap-southeast-1-f84c5ac0ed1" and a "Destination details" section. The footer includes links for CloudShell, Feedback, Privacy, Terms, and Cookie preferences, along with a copyright notice for 2025.

aws | Search [Alt+S]

Amazon S3 > Buckets > classify-images-console-ap-southeast-1-f84c5ac0ed1 > Upload

Upload Info

Add the files and folders you want to upload to S3. To upload a file larger than 160GB, use the AWS CLI, AWS SDKs or Amazon S3 REST API. [Learn more](#)

Drag and drop files and folders you want to upload here, or choose **Add files** or **Add folder**.

Files and folders (0)

All files and folders in this table will be uploaded.

Find by name

Name ▾ | Folder ▾ | Type ▾ | Size ▾

No files or folders
You have not chosen any files or folders to upload.

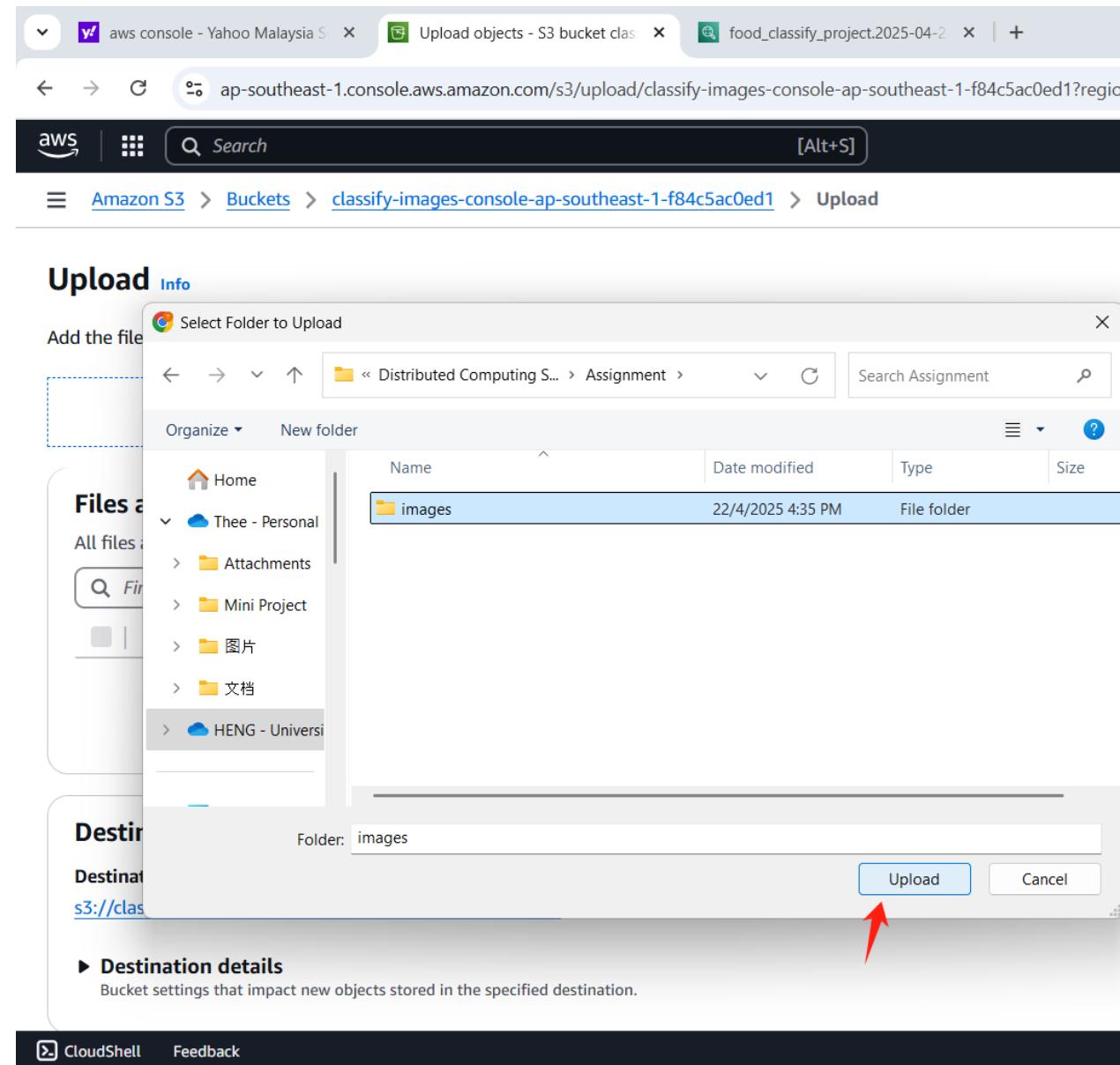
Destination Info

Destination
<s3://classify-images-console-ap-southeast-1-f84c5ac0ed1>

▶ **Destination details**
Bucket settings that impact new objects stored in the specified destination.

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Step 19: Upload images folder.



Step 20: Click on the “Upload”.

Screenshot of the AWS S3 Upload interface showing the final step before upload.

The interface includes:

- Header:** AWS logo, Search bar, [Alt+S] key, Notifications, Help, and Settings.
- Breadcrumbs:** Amazon S3 > Buckets > classify-images-console-ap-southeast-1-f84c5ac0ed1 > Upload
- Files and folders:** 1 total, 52.8 KB. A table lists "image1.jpg" as an image/jpeg file in the "images/" folder.
- Buttons:** Remove, Add files, Add folder.
- Destination:** Info, s3://classify-images-console-ap-southeast-1-f84c5ac0ed1.
- Details:** Destination details, Permissions, Properties.
- Actions:** Cancel, Upload (highlighted with a red arrow).

Amazon Rekognition

Function : Detect food items in the fridge compartments.

Step 1: Search for “Amazon Rekognition” in the search bar.

The screenshot shows the AWS search interface. In the top navigation bar, the AWS logo is on the left, followed by a search bar containing the text "amazon rekognition". To the right of the search bar are three icons: a magnifying glass, a bell, and a question mark. Below the search bar, the word "Services" is displayed in a bold, dark font. On the left side of the main content area, there is a sidebar with a list of links: Services (which is highlighted in blue), Features, Resources (with a "New" badge), Documentation, Knowledge articles, Marketplace, Blog posts, Tutorials, and Events. The main content area is titled "Services" and contains three items: "Amazon Rekognition" (with a magnifying glass icon), "AWS Private Certificate Authority" (with a certificate icon), and "Amazon Redshift" (with a database icon). A red arrow points to the "Amazon Rekognition" item. Below this section, there is another title "Features" followed by three items: "AMIs" (with an orange square icon), "Dashboard" (with a blue square icon), and "Export snapshots to EC2" (with an orange square icon). At the bottom left, there is a question "Were these results helpful?" with two buttons: "Yes" and "No".

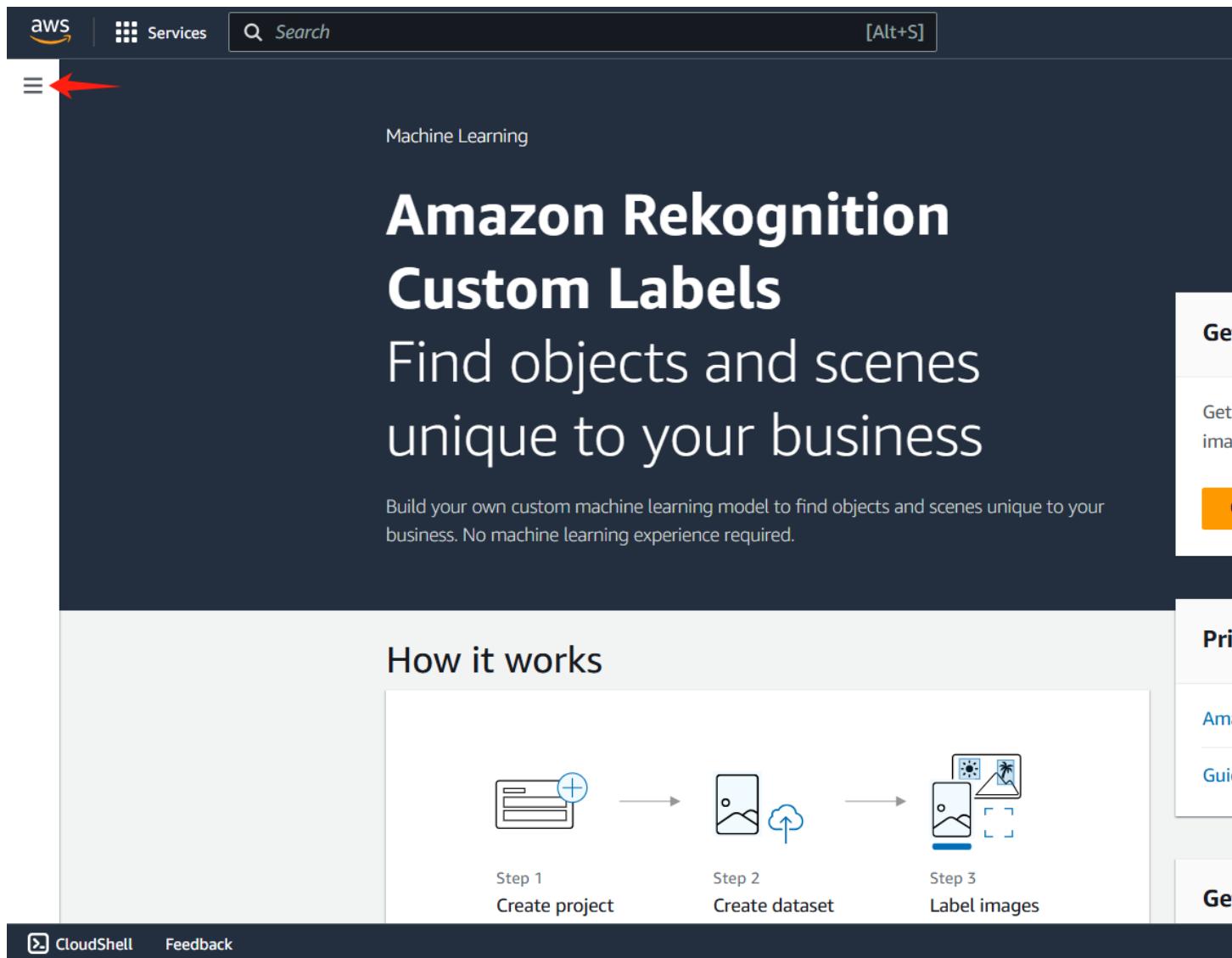
Step 2: Click on the “Use Custom Labels” under “Custom Labels”.

The screenshot shows the Amazon Rekognition service page within the AWS Management Console. The left sidebar contains a navigation menu with the following items:

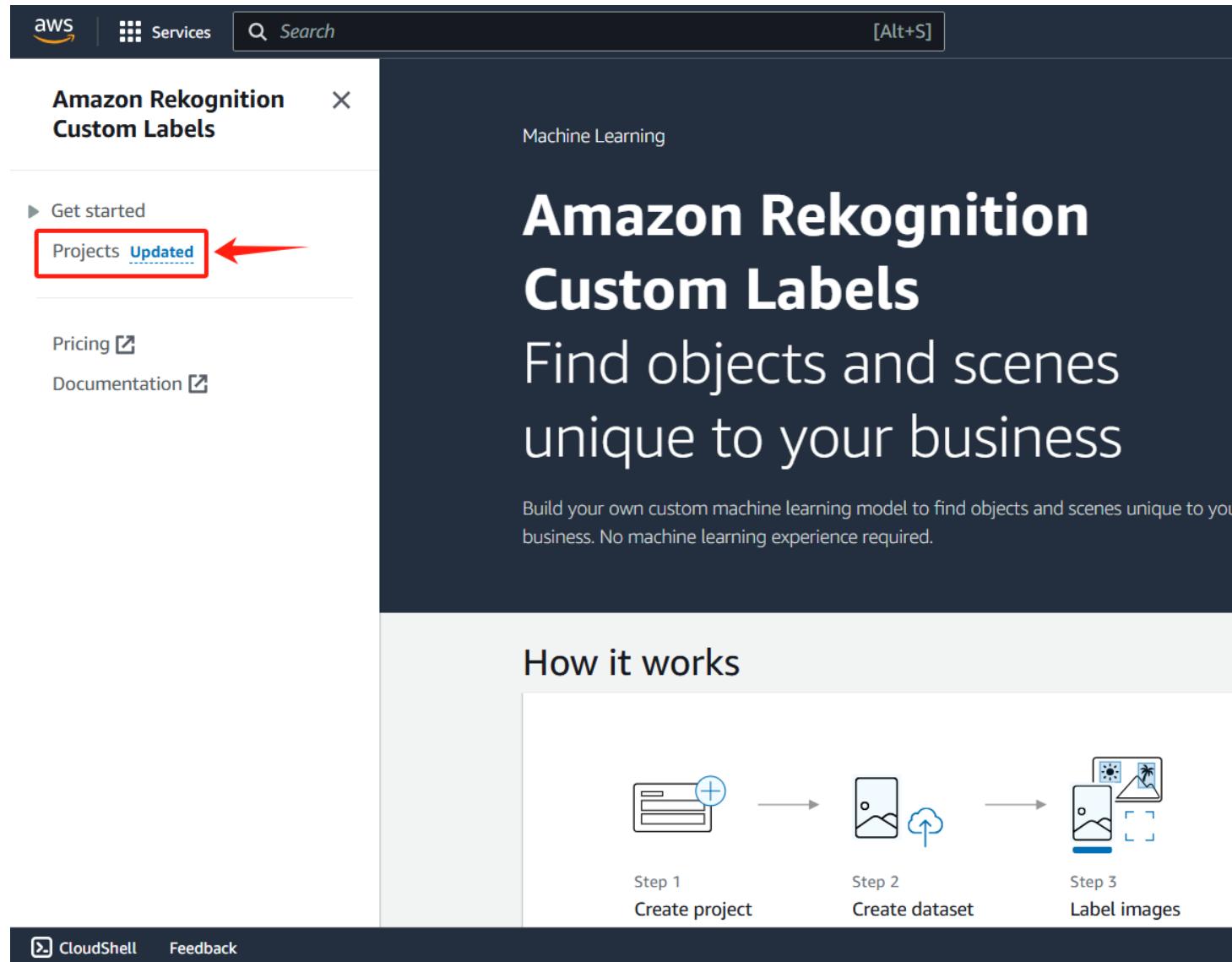
- Custom Moderation New
- Bulk Analysis New
- Custom Labels
 - Use Custom Labels
- Demos
 - Label detection
 - Image properties
 - Image moderation
 - Facial analysis
 - Face comparison
 - Celebrity recognition
 - Text in image
 - PPE detection
- Video Demos
 - Stored Video Analysis
 - Streaming Video Events
- Metrics
 - Metrics

A red box highlights the "Use Custom Labels" link under the "Custom Labels" section, and a red arrow points to it from the left. The main content area features the Amazon Rekognition logo and tagline: "Deep learning-based visual analysis service" and "Search, verify, and organize millions of images and videos". It includes a "Try Demo" button and a "Download SDKs" link. Below this, there are two sections: "Leverage proven image and video analysis" (with a stack of squares icon) and "Detect objects unique to you" (with a circuit board icon). At the bottom, there are "Feature Spotlight" and "Learning Content" sections.

Step 3: Click on the menu icon to expand the left navigation bar.



Step 4: Click on the “Projects”



Step 5: Click on the “Create project” to create a new project

The screenshot shows the AWS Lambda console interface for managing AWS Lambda functions. At the top, there's a navigation bar with the AWS logo, a 'Services' dropdown, a search bar, and a 'Custom Labels' section. Below the navigation bar, the main content area has a title 'Amazon Rekognition Custom Labels' and a sub-section 'Projects Updated'. On the left, there's a sidebar with links for 'Get started', 'Projects (0)', 'Pricing', and 'Documentation'. The main content area displays a message about datasets being associated with projects, followed by a table header for 'Projects (0) Info' with columns: Name, Versions, Date created, Model performance, Model status, and Status message. A large orange button labeled 'Create project' is visible at the bottom of the table area. A red arrow points to this button, indicating it should be clicked to start creating a new project.

Step 6: Enter project name and click on the “Create project”

The screenshot shows the 'Amazon Rekognition Custom Labels' interface. On the left, there's a sidebar with 'Get started', 'Projects' (which is 'Updated'), 'Pricing', and 'Documentation'. The main area shows 'Custom Labels > Create project'. A modal window titled 'Create project' is open, containing an info icon and a message: 'The first step in creating a custom model is to create a project. A project is where you create and manage datasets and models. The models you create in this project inherit the name of the project.' Below this, a 'Project details' section has a 'Project name' input field containing 'food_classify_project', which is highlighted with a red arrow. To the right of the input field are 'Cancel' and 'Create project' buttons, with the 'Create project' button circled in orange and another red arrow pointing towards it.

Custom Labels > Create project

Create project Info

Create project

The first step in creating a custom model is to create a project. A project is where you create and manage datasets and models. The models you create in this project inherit the name of the project.

Project details

Project name

food_classify_project

The project name can't be more than 63 characters. It can only contain alphanumeric characters, with no spaces or special characters.

Cancel **Create project**

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Step 7: Click on the “Create dataset”

Screenshot of the Amazon Rekognition Custom Labels console showing the "food_classify_project" project details page.

The left sidebar shows the navigation path: [Custom Labels](#) > [Projects](#) > food_classify_project. The main content area displays the project details and a "How it works" section.

How it works:

- Creating your dataset**:
 - 1. Create dataset**: A dataset is a collection of images, and image labels, that you use to train or test a model. The "Create dataset" button is highlighted with a red oval and a red arrow pointing to it.
 - 2. Label images**: Labels identify objects, scenes, or concepts on an entire image, or they identify object locations on an image. There is a "Add labels" button.
- Training your model**:
 - 3. Train model**: Depending on the training dataset the training model finds image-level scenes and concepts, or it finds object locations. There is a "Train model" button.

Project details

Project name	Created	Dataset
food_classify_project	April 20, 2025 at 19:08:29 (UTC+08:00)	0 training labels, 0 training images, 0 test labels, 0 test images

Bottom navigation bar: CloudShell, Feedback, © 2025, Amazon Web Services

Step 8: Configure the settings. We will select the configuration options to start with a single dataset.

The screenshot shows the Amazon Rekognition Custom Labels interface. In the top navigation bar, the AWS logo, Services menu, a search bar with placeholder 'Search' and keyboard shortcut '[Alt+S]', and several icons for notifications and account management are visible. The main left sidebar for the 'Custom Labels' service lists 'Get started', 'Projects' (which is 'Updated'), and a selected project named 'food_classify_project'. Under this project, there are links for 'Dataset', 'Pricing', and 'Documentation'. The main content area is titled 'Create dataset' and shows the 'Starting configuration' section. It contains two configuration options: 'Start with a single dataset' (selected, highlighted with a red arrow) and 'Start with a training dataset and a test dataset'. Below this, a callout box provides information about training and test datasets. The URL in the browser's address bar is 'Custom Labels > food_classify_project > Create dataset'.

Amazon Rekognition
Custom Labels

Custom Labels > food_classify_project > Create dataset

Create dataset Info

Starting configuration

Configuration options

Start with a single dataset (arrow pointing here)
When you train your model, the dataset is split to create the training dataset (80%) and test dataset (20%) for your project.

Start with a training dataset and a test dataset
Recommended for most users. Start with the highest control over training, testing, and performance tuning.

i What are training datasets and test datasets?

- A training dataset teaches your model to identify scenes or objects in images.
- A test dataset evaluates the performance of your trained model.

Step 9: Choose any of the options below and click “Create Dataset”.
In this case, we will choose to import images from S3 bucket.

aws | Services | Search [Alt+S] | ☰ | 🔍 | ⓘ | ⚙️ | ⌂

Amazon Rekognition Custom Labels

Get started

Projects Updated

food_classify_project

Dataset

Pricing ↗

Documentation ↗

Training dataset details

Import training images | Info Import images from one of the sources below.

Import images from S3 bucket Use images from an existing S3 bucket by entering the S3 bucket URI. You can automatically add labels based on your S3 bucket folder names.


Upload images from your computer Add images by uploading files from your local computer. You're limited to uploading 30 images at one time.


Copy an existing Amazon Rekognition Custom Labels dataset Use an existing dataset as a starting point for your new dataset. Your original dataset will remain unchanged.


Import images labeled by SageMaker Ground Truth Provide the location of your manifest file. If you have a labeled datasets in a different format, convert them to a manifest format.


Create Dataset

Step 10: Go to Amazon S3 > Buckets page and click on the created bucket.

The screenshot shows the AWS S3 Buckets page. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'Amazon S3 > Buckets'. On the left, there are tabs for 'General purpose buckets' (which is selected) and 'Directory buckets'. A banner at the top says 'Account snapshot - updated every 24 hours' and 'View Storage Lens dashboard'. Below the banner, it says 'Storage lens provides visibility into storage usage and activity trends. Metrics don't include directory buckets.' A 'Learn more' link is provided. The main area displays a table of 'General purpose buckets' with the following data:

Name	AWS Region	IAM Access Analyzer	Creation date
custom-labels-console-ap-southeast-1-f84c5ac0ed	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 17:04:55 (UTC+08:00)
custom-labels-console-ap-southeast-1-f84c5ac0ed1	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 20:14:44 (UTC+08:00)
sagemaker-ap-southeast-1-346701284971	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 13:41:08 (UTC+08:00)
sagemaker-studio-346701284971-da70agu6m5s	Asia Pacific (Singapore) ap-southeast-1	View analyzer for ap-southeast-1	April 20, 2025, 13:41:05 (UTC+08:00)

At the bottom of the table, there are buttons for 'Copy ARN', 'Empty', 'Delete', and 'Create bucket'. Below the table, there are navigation arrows and a settings icon. The footer of the page includes links for CloudShell, Feedback, Copyright notice (© 2025, Amazon Web Services, Inc. or its affiliates.), Privacy, Terms, and Cookie preferences.

Step 11: Select the folder containing images and click on the “Copy S3 URL”.

The screenshot shows the AWS S3 console interface. At the top, there's a navigation bar with the AWS logo, a search bar, and various icons. Below it, the breadcrumb navigation shows 'Amazon S3 > Buckets > custom-labels-console-ap-southeast-1-f84c5ac0ed1'. The main content area is titled 'custom-labels-console-ap-southeast-1-f84c5ac0ed1' with an 'Info' link. Below this, there are tabs for 'Objects', 'Properties', 'Permissions', 'Metrics', 'Management', and 'Access Points'. The 'Objects' tab is selected. The 'Actions' menu is open, showing options like 'Copy S3 URI', 'Copy URL', 'Download', 'Open', 'Delete', 'Actions', 'Create folder', and 'Upload'. A red arrow labeled '1.' points to the 'food items/' folder listed in the object table. Another red arrow labeled '2.' points to the 'Copy S3 URI' button in the toolbar. The object table has columns for Name, Type, Last modified, Size, and Storage class. The 'Name' column shows 'food items/' and 'Type' shows 'Folder'. The bottom of the page includes links for CloudShell, Feedback, and various legal and preference links.

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Step 12: Paste the copied S3 URL into S3 URI in Amazon Rekognition Custom Labels page and click on the checkbox to automatically assign image-level labels to images based on the folder name.

The screenshot shows the Amazon Rekognition Custom Labels console. On the left, there's a sidebar with options like 'Get started', 'Projects' (which is selected and highlighted in blue), 'food_classify_project', 'Dataset', 'Pricing', and 'Documentation'. The main area is titled 'Amazon Rekognition Custom Labels'. It has a 'S3 URI' input field containing the URL 's3://custom-labels-console-ap-southeast-1-f84c5ac0ed1/food items/'. Below this, there's a note about supported image formats and a recommendation to upload images from an S3 bucket. A red arrow points to this URL field. Another red arrow points to the 'Automatic labeling' section, which contains a checked checkbox labeled 'Automatically assign image-level labels to images based on the folder name'. This section also includes a hierarchical tree view of an S3 bucket structure: 'image_folder' contains 'golden_retriever' (with one image icon) and 'collie' (with two image icons). At the bottom, a section titled 'Make sure that your S3 bucket is correctly configured' provides instructions for specifying an external S3 bucket and copying its policy.

S3 URI

s3://custom-labels-console-ap-southeast-1-f84c5ac0ed1/food items/

Supported image formats: JPG, PNG. Maximum images per dataset: 250,000. Maximum image size: 15 MB, Minimum size (px): 64 x 64. Maximum size (px): 4096 x 4096. Images must have the same dimensions.

For best results, we recommend uploading images from folders within the [S3 bucket](#) created for you during first-time setup.

Automatic labeling

If you've organized the images in your S3 bucket by folder name (/Golden-Retriever/01.jpeg), Custom Labels can automatically label these images.

Automatically assign image-level labels to images based on the folder name

image_folder

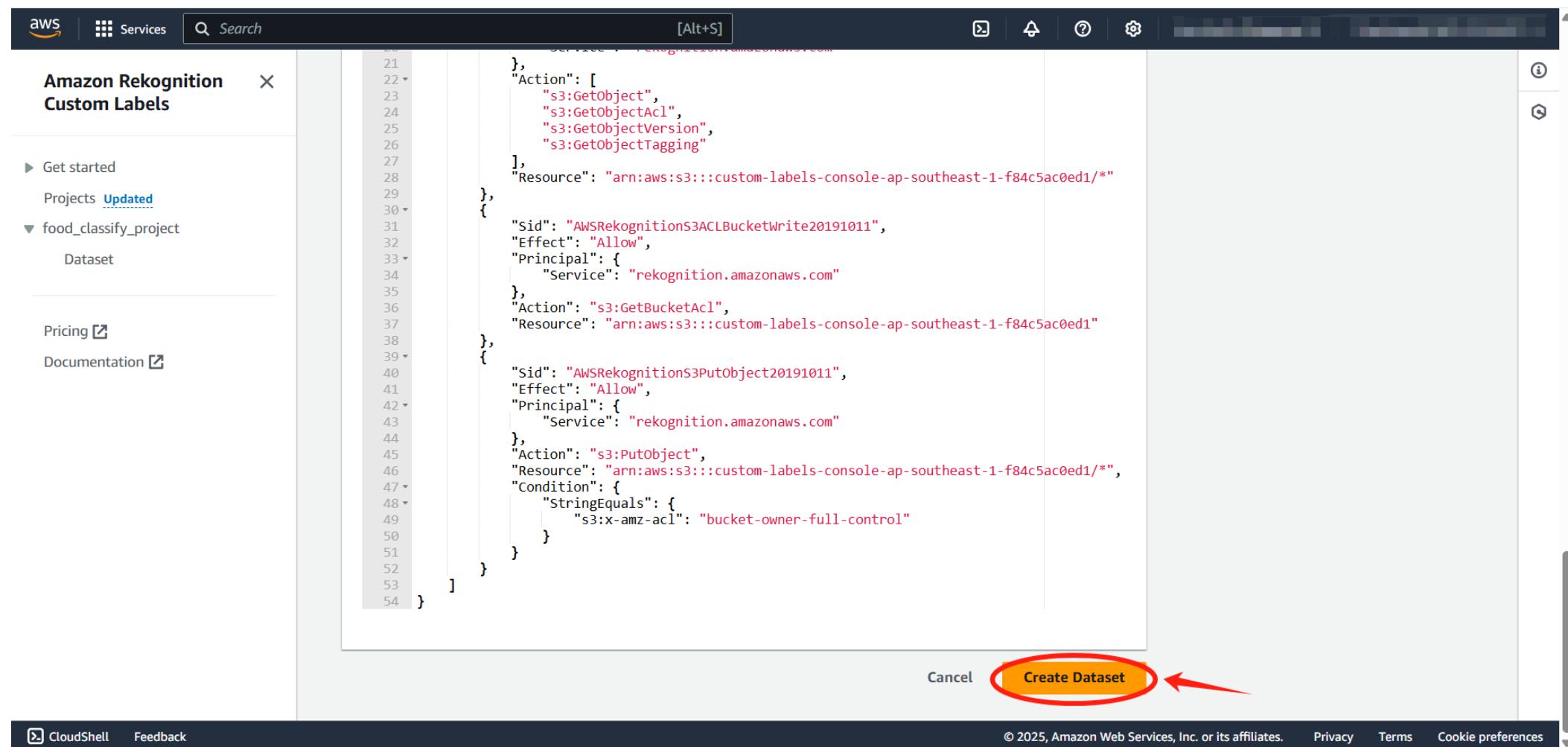
- golden_retriever
 - golden_retriever
- collie
 - collie
 - collie

Make sure that your S3 bucket is correctly configured

You've specified an external S3 bucket: **custom-labels-console-ap-southeast-1-f84c5ac0ed1**. To use the images in this bucket, copy the policy below (to copy, choose the preceding link text). [Paste the policy into the "Bucket Policy" section of custom-labels-console-ap-southeast-1-f84c5ac0ed1](#).

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Step 13: Scrolls down to bottom and click on the “Create dataset” button.



Step 14: After creating the dataset, click on the “Train model”.

Screenshot of the Amazon Rekognition Custom Labels interface showing the Dataset creation process. A red arrow points to the "Train model" button in the top right corner of the toolbar.

The interface includes a sidebar with "Get started", "Projects" (Updated), and the current "food_classify_project". Under "Dataset", there are sections for "Review dataset", "Add labels", "Label images", and "Train model".

Dataset Info

Preparing your dataset

- 1. Review dataset**
Verify that your images are labeled correctly. If the dataset needs more images, choose Actions and then the appropriate dataset under Add Images.
[Learn more](#)
- 2. Add labels**
You add labels for each type of object, scene, or concept in your dataset. To add or modify labels, choose Start labeling and then choose Edit labels.
[Learn more](#)
- 3. Label images**
Choose the images that you want to label. If you need to label an entire image, choose Assign labels and assign image-level labels. If you need to label object locations, Choose Draw bounding boxes. Then draw bounding boxes around objects and assign labels. Choose Save changes to finish.
[Learn more](#)
- 4. Train model**
After your datasets are ready, Choose Train model to train your model. Then, evaluate and use the model to find objects, scenes, and concepts in new images.
[Learn more](#)

Labels [Manage labels](#)

Images (300)

[Search images by file name](#)

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Step 15: Click and select the project to classify food items.

The screenshot shows the 'Train model' page in the Amazon Rekognition Custom Labels service. The left sidebar lists 'Get started', 'Projects Updated', 'Pricing', and 'Documentation'. The main content area has a title 'Train model' and a sub-section 'Train model' with instructions about training using project datasets and AWS KMS encryption. Below this is a 'Training details' section with a 'Choose project' field containing the ARN: `arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/1745147309410`. A red arrow points to the end of this ARN string. The bottom section is titled 'Tags' and indicates 'No tags associated with the resource'.

Custom Labels > Train model

Train model

Train model

To train your model, Amazon Rekognition Custom Labels uses your project's training dataset and test dataset. You can add tags to help track your models. You can also encrypt your images with your own AWS Key Management Service key.

Training details Info

Choose project

Amazon Rekognition Custom Labels trains a new version of the model within the project you choose.

arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/1745147309410

Tags Info

A tag is a label that you can assign to your model. Each tag consists of a key and an optional value.

No tags associated with the resource.

Add new tag

You can add up to 50 more tags.

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Step 16: Click on the “Train Model”.

The screenshot shows the 'Amazon Rekognition Custom Labels' interface. On the left, there's a sidebar with 'Get started' and 'Projects Updated'. The main area is titled 'Training details' and contains sections for 'Choose project' (with a search bar containing 'arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/1745147309410'), 'Tags' (with a note about tags and an 'Add new tag' button), and 'Image Data Encryption' (with a note about encryption and a checkbox for 'Customize encryption settings (advanced)'). At the bottom right, there are 'Cancel' and 'Train Model' buttons, with the 'Train Model' button being highlighted by a red arrow and a yellow oval.

Training details [Info](#)

Choose project

Amazon Rekognition Custom Labels trains a new version of the model within the project you choose.

arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/1745147309410

Tags [Info](#)

A tag is a label that you can assign to your model. Each tag consists of a key and an optional value.

No tags associated with the resource.

Add new tag

You can add up to 50 more tags.

Image Data Encryption

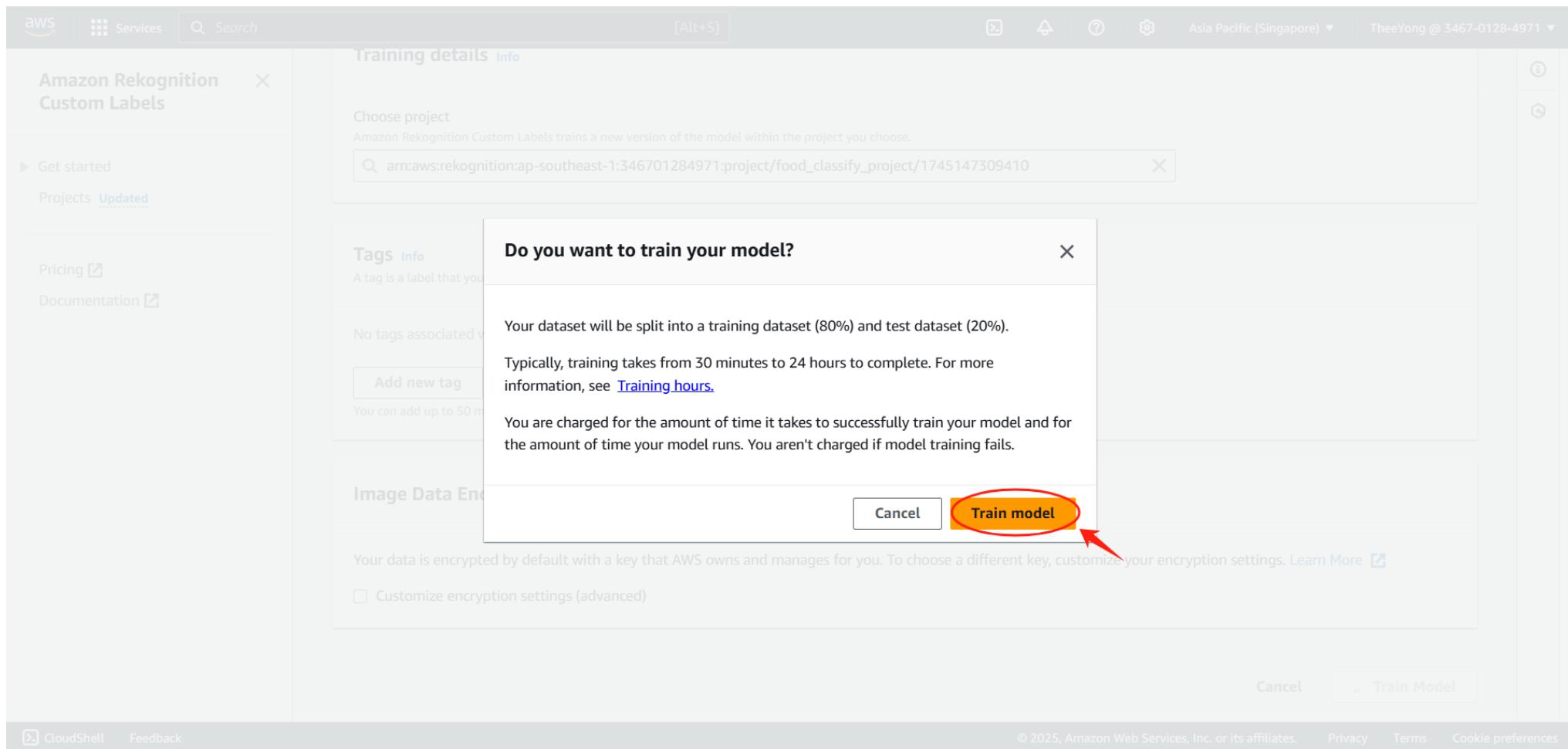
Your data is encrypted by default with a key that AWS owns and manages for you. To choose a different key, customize your encryption settings. [Learn More](#)

Customize encryption settings (advanced)

Cancel **Train Model**

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Step 17: Click on the “Train Model” again.



Step 18: After half an hour, the model training was completed. Click on the trained model.

The screenshot shows the Amazon Rekognition Custom Labels console. On the left, a sidebar lists 'Get started', 'Projects' (marked as 'Updated'), and a selected project named 'food_classify_project'. Under this project, there are links for 'Dataset', 'Pricing', and 'Documentation'. The main content area has tabs for 'Dataset', 'Labels', 'Model', and 'Metrics'. The 'Model' tab is active, showing 'Project details' for 'food_classify_project' created on April 20, 2025. It lists 5 training labels, 240 training images, 5 test labels, and 60 test images. Below this, the 'Models' section shows one entry: 'food_classify_project.2025-04-22T01.31.50', which was created on April 22, 2025. This model has a performance score of 1.000 and is in 'TRAINING_COMPLETED' status, with a message stating 'The model is ready to run.' A red box highlights the model name in the table, and a red arrow points to the creation date.

A dataset is a collection of images, and image labels, that you use to train or test a model.

Labels identify objects, scenes, or concepts on an entire image, or they identify object locations on an image.

Depending on the training dataset, the training model finds image-level scenes and concepts, or it finds object locations.

Performance metrics tell you if your model needs additional training before you can use it.

Created

Add labels

Train model

Check metrics

Project details

Project name food_classify_project	Created April 20, 2025 at 19:08:29 (UTC+08:00)	Dataset 5 training labels, 240 training images, 5 test labels, 60 test images	Models 1
---------------------------------------	--	--	-------------

Models (1)

<input type="checkbox"/>	Name	Date created	Training dataset	Test dataset	Model performance (F1 score)	Model status	Status message
<input type="checkbox"/>	food_classify_project.2025-04-22T01.31.50	April 22, 2025			1.000	TRAINING_COMPLETED	The model is ready to run.

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Step 19: Click on the “Use model”.

The screenshot shows the Amazon Rekognition Custom Labels console. The top navigation bar includes the AWS logo, Services dropdown, a search bar with the placeholder 'Search [Alt+S]', and various icons for refresh, help, and settings. The main navigation path is 'Custom Labels > Projects > food_classify_project > Models > food_classify_project.2025-04-22T01.31.50'. On the left, a sidebar lists 'Get started', 'Projects Updated' (which is selected), and 'food_classify_project' with a 'Dataset' option. Below these are 'Pricing' and 'Documentation' links. The main content area displays the details for the model 'food_classify_project.2025-04-22T01.31.50'. A red box highlights the 'Use model' tab in the navigation bar, which is currently active. An arrow points from this tab to the 'Evaluation' section below. The 'Evaluation' section contains an information icon and text explaining that it shows testing results for the trained model. It includes a 'View test results' button. Below this is the 'Evaluation results' section, which lists F1 score (1.000), Average precision (1.000), Overall recall (1.000), Date completed (April 21, 2025), Training dataset (5 labels, 227 images), and Testing dataset (5 labels, 57 images). At the bottom, there is a 'Per label performance (5)' section with a search bar for 'Find labels' and a page navigation bar showing page 1 of 1.

Custom Labels > Projects > food_classify_project > Models > food_classify_project.2025-04-22T01.31.50

food_classify_project.2025-04-22T01.31.50 [Info](#) [Delete model](#)

Evaluation Model details Use model Tags

Evaluation

The Evaluation tab shows the testing results for your trained model. This helps you understand the overall performance of your model. To view the results for an image, choose the View test results button.

Evaluation results

F1 score [Info](#) 1.000 Average precision [Info](#) 1.000 Overall recall [Info](#) 1.000

Date completed April 21, 2025 Training dataset 5 labels, 227 images

Trained in 0.821 hours Testing dataset 5 labels, 57 images

Per label performance (5)

Find labels

1

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Step 20: Expand the “API Code” tab and then click on “Copy” to copy the API Code.

The screenshot shows the AWS Amazon Rekognition Custom Labels console. The left sidebar shows a navigation tree with 'Get started', 'Projects' (which is 'Updated'), and a selected 'food_classify_project' which contains a 'Dataset'. The main content area displays an ARN: arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099. Below this, the 'API Code' section is expanded, indicated by a red arrow labeled '1.' A 'Copy' button is highlighted with a red box and a red arrow labeled '2.' under the heading 'Start model'. The 'Start model' command is:

```
aws rekognition start-project-version \
--project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
--min-inference-units 1 \
--region ap-southeast-1
```

Below this, the 'Analyze image' section is shown with its own 'Copy' button, although no command is visible in the screenshot.

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Step 21: Click on the icon to open AWS Cloud Shell

The screenshot shows the AWS CloudShell interface. At the top, there's a navigation bar with the AWS logo, a 'Services' dropdown, a search bar, and a 'CloudShell' icon. Below the navigation bar, the main content area has a dark header titled 'Amazon Rekognition Custom Labels'. On the left, a sidebar lists 'Get started', 'Projects' (which is 'Updated'), and a 'food_classify_project' section containing 'Dataset', 'Pricing', and 'Documentation'. The main content area is titled 'API Code' and contains instructions for using the model. It includes sections for 'Start model' and 'Analyze image', each with a 'Copy' button and a code snippet. A red circle and arrow highlight the 'CloudShell' icon in the top right corner of the interface.

API Code

Use your model food_classify_project.2025-04-22T01.31.50 by calling the following AWS CLI commands or Python scripts. You can start and stop the model, and analyze custom labels in new images.

AWS CLI command

Python

Start model

Command used to start the food_classify_project.2025-04-22T01.31.50 model.

Analyze image

Command used to use analyze an image with the food_classify_project.2025-04-22T01.31.50 model. Replace MY_BUCKET and PATH_TO_MY_IMAGE with your S3 bucket name and image path.

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Step 22: Paste the copied API code to start the model.

The screenshot shows the AWS CloudShell interface in a browser window. The top navigation bar includes the AWS logo, Services, a search bar, and various icons. On the left, the Amazon Rekognition Custom Labels dashboard is visible, showing a 'Projects' section with 'food_classify_project' selected. A tooltip indicates that a code snippet has been copied. Below the dashboard, the CloudShell terminal window is open, showing a command line with a red arrow pointing to the '--region' parameter. The command is:

```
~ $ aws rekognition start-project-version \
>   --project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
>   --min-inference-units 1 \
>   --region ap-southeast-1
```

The terminal also displays the copyright notice: © 2025, Amazon Web Services, Inc. or its affiliates.

Step 23: Copy the API code for analyzing image.

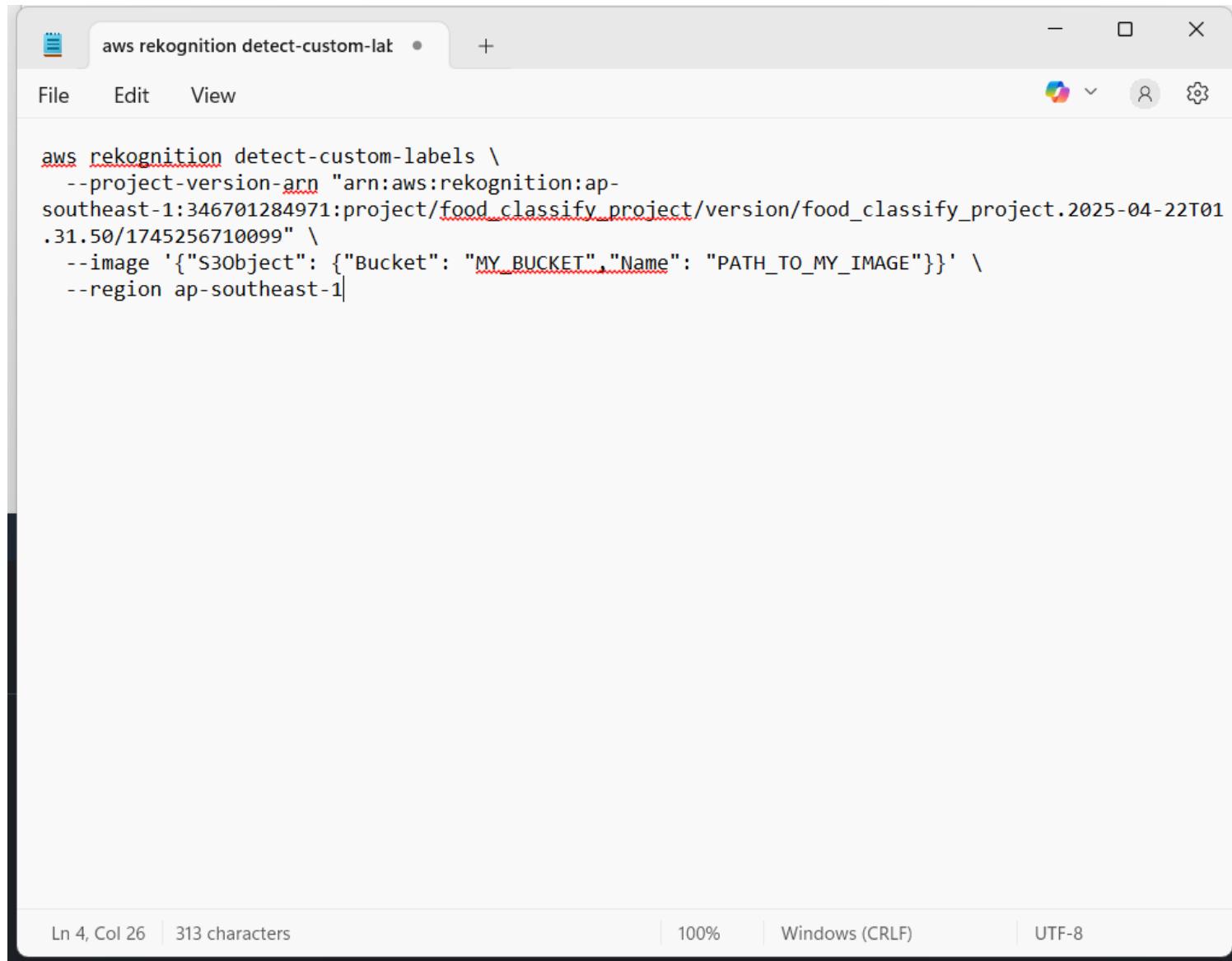


The screenshot shows the AWS Amazon Rekognition Custom Labels console. On the left, there's a sidebar with options like 'Get started', 'Projects' (which is 'Updated'), 'food_classify_project', 'Dataset', 'Pricing', and 'Documentation'. The main area is titled 'Analyze image' and contains a command-line interface (CLI) command:

```
aws rekognition detect-custom-labels \
--project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
--image '{"S3object": {"Bucket": "MY_BUCKET", "Name": "PATH_TO_MY_IMAGE"}}' \
--region ap-southeast-1
```

A red arrow points to the 'Copy' button next to the command. Below the command, there's another section titled 'Stop model' with its own CLI command.

Step 24: Paste the copied API code in any text editor.

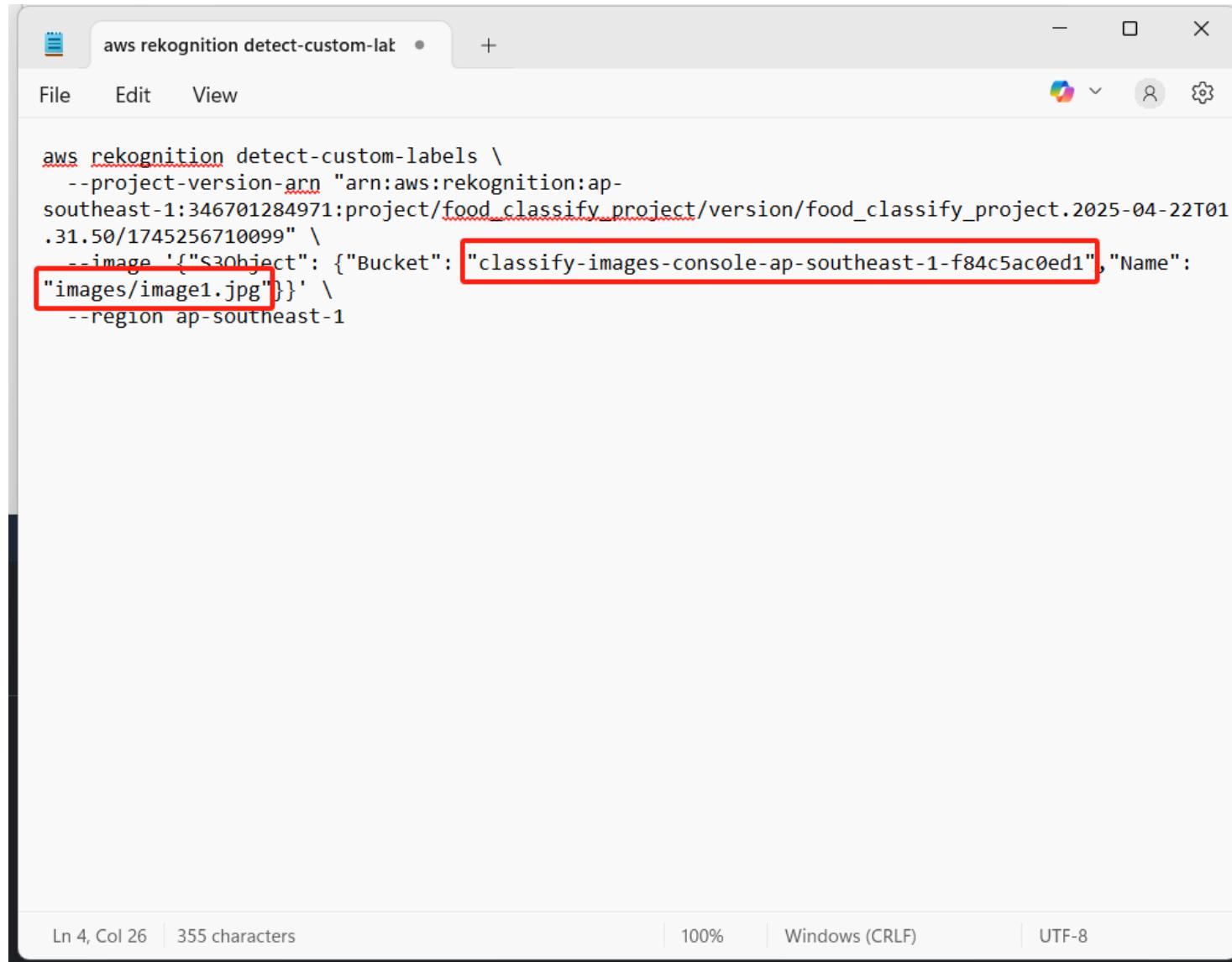


A screenshot of a text editor window titled "aws rekognition detect-custom-labels". The window contains the following AWS Rekognition API command:

```
aws rekognition detect-custom-labels \
    --project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
    --image '{"S3Object": {"Bucket": "MY_BUCKET", "Name": "PATH_TO_MY_IMAGE"}' \
    --region ap-southeast-1
```

The text editor interface includes a menu bar with File, Edit, View, and a toolbar with various icons. The status bar at the bottom shows "Ln 4, Col 26 | 313 characters" and encoding information "Windows (CRLF) | UTF-8".

Step 25: Modify the bucket name to images bucket name and path to the images folder.



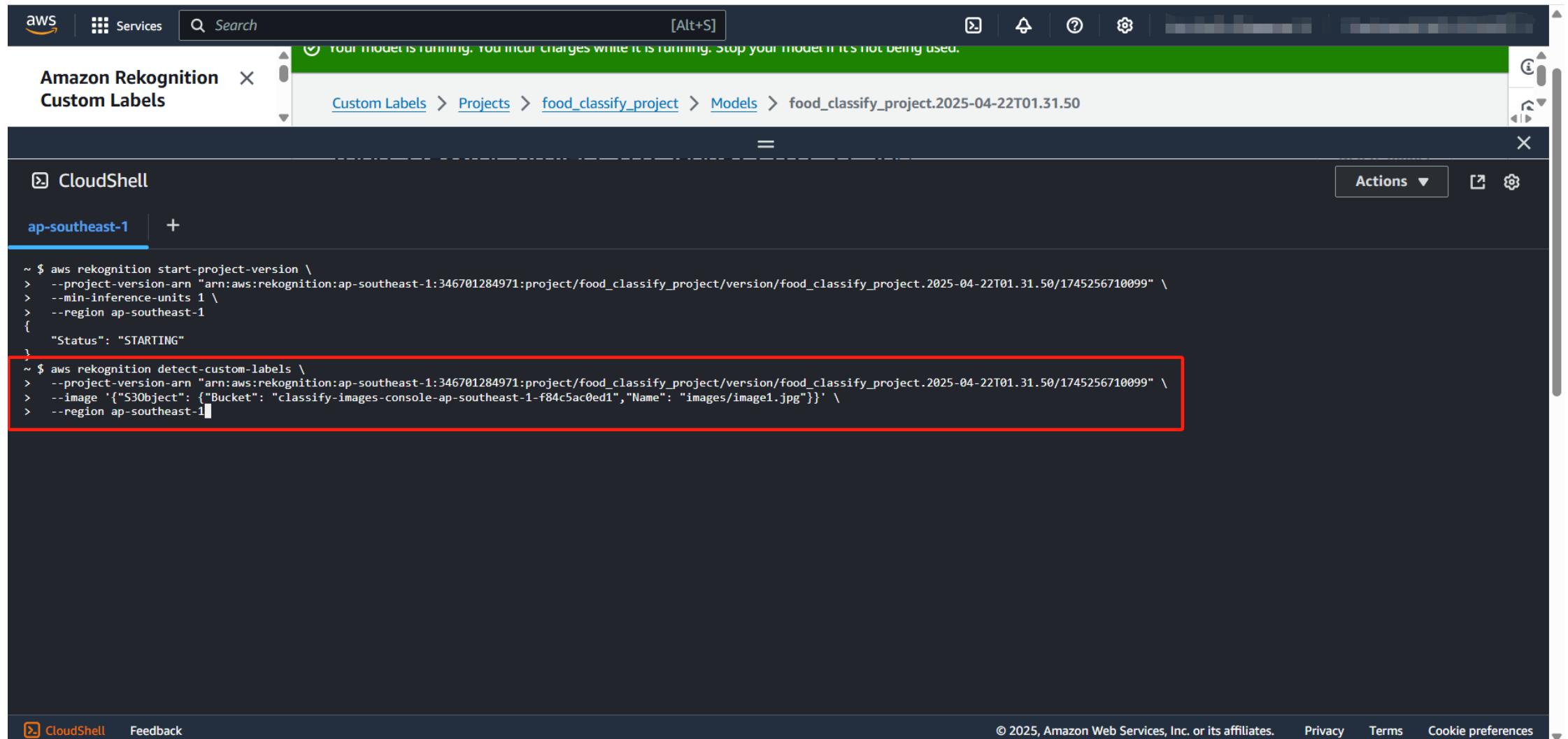
The screenshot shows a terminal window titled "aws rekognition detect-custom-labels". The command entered is:

```
aws rekognition detect-custom-labels \
    --project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
    --image '{"S3Object": {"Bucket": "classify-images-console-ap-southeast-1-f84c5ac0ed1", "Name": "images/image1.jpg"}' \
    --region ap-southeast-1
```

The line containing the S3 object path ("S3Object: {"Bucket": ..., "Name": ...}") is highlighted with a red rectangular box.

At the bottom of the terminal window, the status bar displays: Ln 4, Col 26 | 355 characters | 100% | Windows (CRLF) | UTF-8

Step 26: Paste the API code to AWS Cloud Shell to analyze the images.



The screenshot shows the AWS CloudShell interface within the Amazon Rekognition Custom Labels service. The navigation path is: Custom Labels > Projects > food_classify_project > Models > food_classify_project.2025-04-22T01.31.50. The CloudShell tab is selected, showing a session for the region ap-southeast-1. The terminal window displays two AWS CLI commands:

```
~ $ aws rekognition start-project-version \
>   --project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
>   --min-inference-units 1 \
>   --region ap-southeast-1
{
  "Status": "STARTING"
}
~ $ aws rekognition detect-custom-labels \
>   --project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
>   --image '{"S3Object": {"Bucket": "classify-images-console-ap-southeast-1-f84c5ac0ed1", "Name": "images/image1.jpg"}' \
>   --region ap-southeast-1
```

A red box highlights the second command, which is the one to be pasted into the CloudShell. The AWS logo and services menu are visible at the top, along with a search bar and various status indicators.

Step 27: The result of analyzing the images is shown.

AWS Services Search [Alt+S] X ⓘ ResourceInUseException: ProjectVersion arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099 is STOPPED; cannot be stopped

Amazon Rekognition Custom Labels

CloudShell ap-southeast-1 Actions ▾

```
~ $ aws rekognition start-project-version \
>   --project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
>   --min-inference-units 1 \
>   --region ap-southeast-1
{
  "Status": "STARTING"
}
~ $ aws rekognition detect-custom-labels \
>   --project-version-arn "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project.2025-04-22T01.31.50/1745256710099" \
>   --image '{"S3Object": {"Bucket": "classify-images-console-ap-southeast-1-f84c5ac0ed1", "Name": "images/image1.jpg"}}' \
>   --region ap-southeast-1
{
  "CustomLabels": [
    {
      "Name": "Apple",
      "Confidence": 100.0
    }
  ]
}
~ $
```

image1.jpg

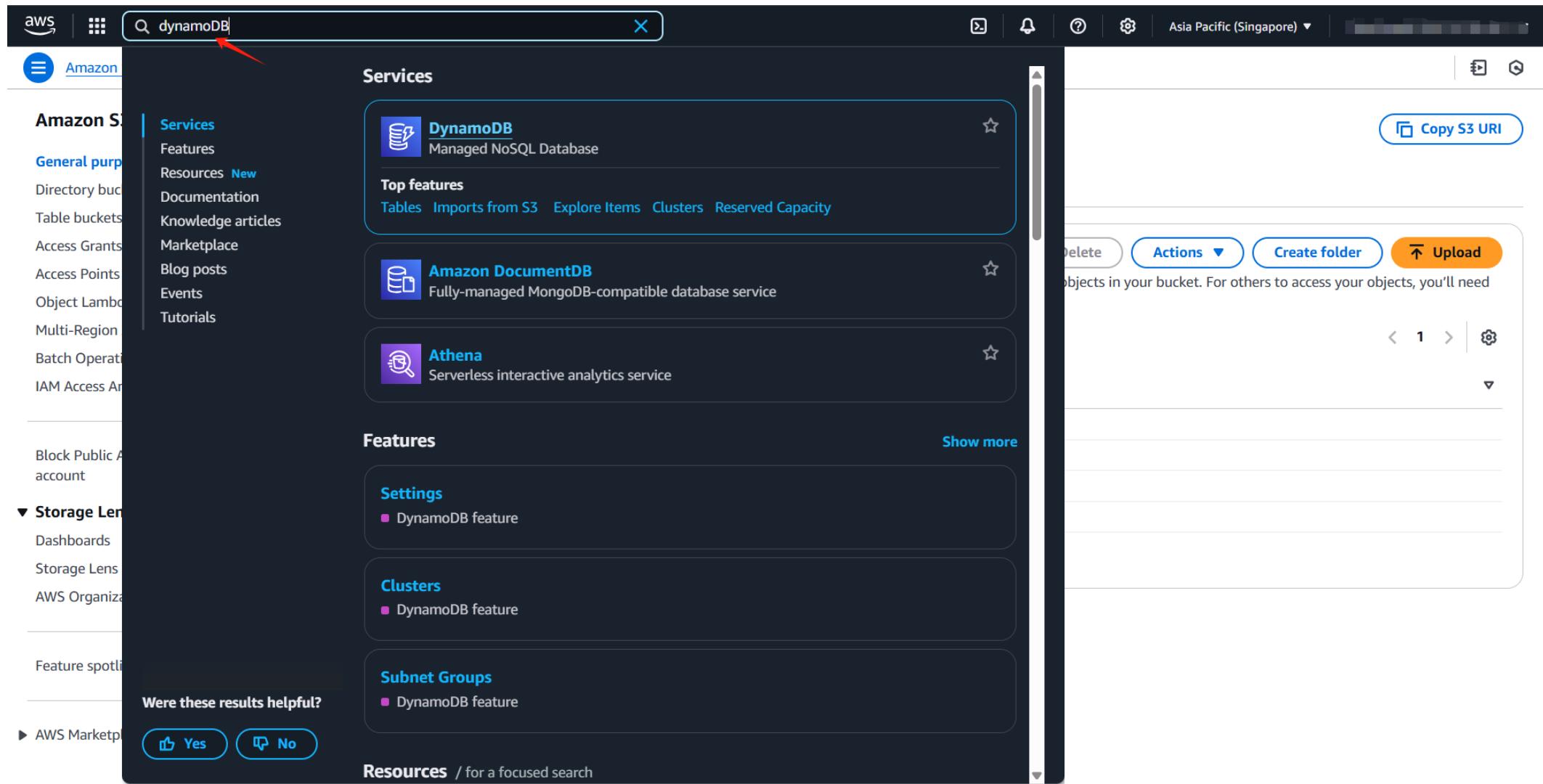


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Amazon Dynamo DB

Function : To store the expiration date of the food

Step 1: Search for “DynamoDB” in the search bar.



The screenshot shows the AWS search interface. A red arrow points to the search bar at the top left, which contains the text "dynamoDB". The search results are displayed under the "Services" section. The first result is "DynamoDB", described as a "Managed NoSQL Database". Below it are "Top features" including Tables, Imports from S3, Explore Items, Clusters, and Reserved Capacity. The second result is "Amazon DocumentDB", described as a "Fully-managed MongoDB-compatible database service". The third result is "Athena", described as a "Serverless interactive analytics service". To the right of the search results, there is a sidebar with "Actions" (Delete, Actions dropdown, Create folder, Upload), a note about sharing objects, and navigation controls (back, forward, settings). At the bottom left, there are "Yes" and "No" buttons for a feedback question, and at the bottom center, there is a link to "Resources / for a focused search".

Step 2: Click “Table” then click “Create Table”

The screenshot shows the AWS DynamoDB console interface. On the left, a sidebar menu for 'DynamoDB' includes options like 'Dashboard', 'Tables' (which is selected and highlighted with a red arrow), 'Explore items', 'PartiQL editor', 'Backups', 'Exports to S3', 'Imports from S3', 'Integrations', 'Reserved capacity', and 'Settings'. Below this is a section for 'DAX' with options for 'Clusters', 'Subnet groups', 'Parameter groups', and 'Events'. The main content area is titled 'Tables (0)' and features a search bar, filters for 'Any tag key' and 'Any tag value', and a 'Create table' button. A large central message states 'You have no tables in this account in this AWS Region.' with a 'Create table' button below it. The top navigation bar includes the AWS logo, a search bar, and links for 'Actions', 'Delete', and 'Create table'.

Step 2: Fill in table name and partition key

The screenshot shows the 'Create table' wizard in the AWS DynamoDB console. The top navigation bar includes the AWS logo, search bar, and region selector ('Asia Pacific (Singapore)'). The breadcrumb path is 'DynamoDB > Tables > Create table'. The main section is titled '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.
Food

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.

food_type String ▾
1 to 255 characters and case sensitive.

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.

Enter the sort key name String ▾
1 to 255 characters and case sensitive.

Table settings

Default settings
The fastest way to create your table. You can modify most of these settings after your table has been created. To modify these settings now, choose 'Customize settings'.

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

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Step 3: Choose “Customize settings” and “DynamoDB Standard”

The screenshot shows the AWS DynamoDB 'Create table' wizard. At the top, there's a navigation bar with the AWS logo, a search bar, and the text '[Alt+S]'. To the right are icons for help, notifications, and settings, followed by 'Asia Pacific (Singapore)'. Below the navigation bar, the breadcrumb trail shows 'DynamoDB > Tables > Create table'. A note below the trail says '1 to 255 characters and case sensitive.'

Table settings

Default settings
The fastest way to create your table. You can modify most of these settings after your table has been created. To modify these settings now, choose 'Customize settings'.

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

Table class Info
Select table class to optimize your table's cost based on your workload requirements and data access patterns.

Choose table class

DynamoDB Standard
The default general-purpose table class. Recommended for the vast majority of tables that store frequently accessed data, with throughput (reads and writes) as the dominant table cost.

DynamoDB Standard-IA
Recommended for tables that store data that is infrequently accessed, with storage as the dominant table cost.

▼ Capacity calculator Info

Step 4: Choose “Provisioned” for capacity mode and off the auto scaling

The screenshot shows the AWS DynamoDB 'Create table' wizard. In the 'Capacity mode' section, the 'Provisioned' option is selected, highlighted with a blue border and a red arrow pointing to it. In the 'Read capacity' section, the 'Auto scaling' option is set to 'Off', also highlighted with a red arrow. In the 'Write capacity' section, the 'Auto scaling' option is also set to 'Off'. Both sections have a 'Provisioned capacity units' input field set to '5'.

Capacity mode

On-demand
Simplify billing by paying for the actual reads and writes your application performs.

Provisioned
Manage and optimize your costs by allocating read/write capacity in advance.

Read capacity

[Auto scaling](#) | [Info](#)
Dynamically adjusts provisioned throughput capacity on your behalf in response to actual traffic patterns.

On

Off ←

Provisioned capacity units
5

Write capacity

[Auto scaling](#) | [Info](#)
Dynamically adjusts provisioned throughput capacity on your behalf in response to actual traffic patterns.

On

Off ←

Provisioned capacity units
5

Warm throughput [Info](#)
Increasing the warm throughput value pre-warms your table to handle planned peak events without throttling or scaling delays. By default, warm throughput values are visible for all tables and global secondary indexes. These values automatically adjust as you increase your provisioned throughput or on-demand consumption without extra charges, but if you choose to change them manually, additional charges apply. Learn more about [Amazon DynamoDB pricing](#).

Read units per second

[CloudShell](#) [Feedback](#)

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Step 5: Keep other setting as default, then scroll down and click “Create table” to create table

The screenshot shows the AWS DynamoDB 'Create table' wizard. At the top, there's a navigation bar with the AWS logo, a search bar, and the text 'Asia Pacific (Singapore)'. Below the navigation is a breadcrumb trail: 'DynamoDB > Tables > Create table'. The main area is divided into two sections: 'Statement' and 'Tags'.

Statement Section:

- A large text input field for JSON statements, with a placeholder 'Add a new statement'.
- Below the input field, a button labeled '+ Add new statement'.
- At the bottom of the section, status indicators: Security: 0, Errors: 0, Warnings: 0, Suggestions: 0.
- A 'Preview external access' link is located on the right side of this section.

Tags Section:

- A heading 'Tags' with a sub-instruction: 'Tags are pairs of keys and optional values, that you can assign to AWS resources. You can use tags to control access to your resources or track your AWS spending.'
- A note: 'No tags are associated with the resource.'
- A button labeled 'Add new tag'.
- A note: 'You can add 50 more tags.'

Action Buttons:

- 'Cancel' button.
- 'Create table' button, which is highlighted with an orange background and a red arrow pointing to it from the bottom right.

Page Footer:

- CloudShell, Feedback links.
- © 2025, Amazon Web Services, Inc. or its affiliates.
- Privacy, Terms, Cookie preferences links.

Step 6: Click on the created table

The screenshot shows the AWS DynamoDB management console. On the left, there's a navigation sidebar for 'DynamoDB' with options like Dashboard, Tables, Explore items, PartiQL editor, Backups, Exports to S3, Imports from S3, Integrations, Reserved capacity, and Settings. Below that is a section for 'DAX' with options for Clusters, Subnet groups, Parameter groups, and Events. The main area is titled 'Tables (1) Info' and shows a table with one item. The table has columns: Name, Status, Partition key, Sort key, Indexes, Replication Regions, Deletion protection, Favorite, Read capacity mode, Write capacity mode, and Total. The single row is for a table named 'Food', which is 'Active' with a partition key of 'food_type (S)'. A red arrow points to the 'Food' link in the Name column. The top of the page includes the AWS logo, a search bar, and navigation icons.

Name	Status	Partition key	Sort key	Indexes	Replication Regions	Deletion protection	Favorite	Read capacity mode	Write capacity mode	Total
Food	Active	food_type (S)	-	0	0	Off	☆	Provisioned (5)	Provisioned (5)	0 b

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Step 7: Click “Explore Item” on the left side then click “Create Item” to create attribute

The screenshot shows the AWS DynamoDB console with the following details:

- Left Sidebar:** Shows the "DynamoDB" navigation bar with "Explore items" highlighted and a red arrow pointing to it.
- Table Selection:** A "Tables (1)" dropdown shows "Food" selected.
- Scan or Query Items:** The "Scan" button is selected under "Scan or query items".
 - "Select a table or index": Table - Food
 - "Select attribute projection": All attributes
- Run:** A yellow "Run" button is visible.
- Completion Message:** A green message box states: "Completed · Items returned: 0 · Items scanned: 0 · Efficiency: 100% · RCU consumed: 0.5".
- Table View:** A table titled "Table: Food - Items returned (0)". It includes columns for "Actions" and "Create item".
 - "Scan started on April 22, 2025, 19:10:50"
 - "No items"
 - "No items to display."
 - A red arrow points to the "Create item" button.
- Page Bottom:** Includes links for CloudShell, Feedback, and footer information: © 2025, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.

Step 8: Input food type and its shelf life, then click “Create Item”

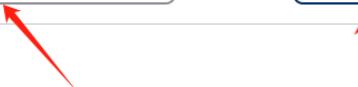
The item has been saved successfully.

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](#)

Attribute name	Value	Type	
food_type - Partition key	Corn	String	Remove
shelf_life	6	Number	Remove

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

Step 9: Then double check all food types are inserted with their shelf life

The screenshot shows the AWS DynamoDB console interface. On the left, the navigation bar includes 'CloudShell', 'Feedback', 'Search [Alt+S]', and account information 'Asia Pacific (Singapore) | TheeYong @ 3467-0128-4971'. The main menu has 'DynamoDB' selected, followed by 'Explore items' and 'Food'. The left sidebar lists 'Dashboard', 'Tables', 'Explore items' (selected), 'PartiQL editor', 'Backups', 'Exports to S3', 'Imports from S3', 'Integrations', 'Reserved capacity', and 'Settings'. Below this is a 'DAX' section with 'Clusters', 'Subnet groups', 'Parameter groups', and 'Events'. The main content area is titled 'Food' and shows the 'Scan or query items' section. It has 'Scan' selected, 'Table - Food' chosen for projection, and 'All attributes' selected. A green success message at the bottom states: 'Completed - Items returned: 0 · Items scanned: 0 · Efficiency: 100% · RCU's consumed: 0.5'. Below this, a table titled 'Table: Food - Items returned (5)' displays five items: Cucumber (shelf_life: 14), Corn (shelf_life: 6), Cabbage (shelf_life: 5), Banana (shelf_life: 7), and Apple (shelf_life: 10). The table has columns for 'Actions' and 'Create item'.

Tables (1)

Any tag key

Any tag value

Find tables

Food

Scan

Query

Select a table or index

Table - Food

Select attribute projection

All attributes

Completed · Items returned: 0 · Items scanned: 0 · Efficiency: 100% · RCU's consumed: 0.5

Table: Food - Items returned (5)

Scan started on April 22, 2025, 19:10:50

Actions

Create item

food_type (String)	shelf_life
Cucumber	14
Corn	6
Cabbage	5
Banana	7
Apple	10

CloudShell Feedback

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AWS Lambda

Function : To trigger AWS rekognition to start recognize image then stop model and retrieve the shelf life of the food then send to user via SNS when image is uploaded to s3

Step 1: Search “Lambda” on the search bar

The screenshot shows the AWS Lambda search results page. In the top navigation bar, the search bar contains the text "lambda". Below the search bar, the "Services" section is expanded, showing the Lambda service card with the text "Run code without thinking about servers" and a red arrow pointing to it. Other services listed include CodeBuild and AWS Signer. The "Features" section lists Lambda Insights, Local processing, and Object Lambda Access Points. The "Resources" section has a callout box titled "Introducing resource search" explaining cross-region resource visibility. The "Documentation" section links to the Lambda User Guide. On the right side of the page, there are sections for Applications (0), Cost usage, and a "Find applications" search bar.

Step 1: Search for “DynamoDB” in the search bar.

Were these results helpful?

Yes No

Documentation

Lambda User Guide

Applications (0) Info Create application

No applications Get started by creating an application. Create application

Cost usage Info Data unavailable Turn on Cost Explorer

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Step 2: Click “Function” on the left side then click “Create Function”

The screenshot shows the AWS Lambda Functions page. On the left, there's a sidebar with 'Lambda' selected under 'Functions'. A red arrow points to the 'Functions' link. At the top right, there's a large orange 'Create function' button. Another red arrow points to this button. The main area is titled 'Functions (0)' and contains a search bar and a table header with columns: Function name, Description, Package type, Runtime, and Last modified. Below the table, it says 'There is no data to display.'

Step 3: Follow the configuration then click “Create Function”

The screenshot shows the AWS Lambda "Create function" wizard. At the top, there's a navigation bar with the AWS logo, a search bar, and a "Create function" button. The main content area has three options: "Author from scratch" (selected), "Use a blueprint", and "Container image". Below these are sections for "Basic information", "Function name" (set to "FoodShelfLife"), "Runtime" (set to "Python 3.9"), "Architecture" (set to "x86_64"), and "Permissions". There are also sections for "Change default execution role" and "Additional Configurations". A red arrow points to the "Create function" button at the bottom right of the main form.

aws Search [Alt+S]

Lambda > Functions > Create function

Create function Info

Choose one of the following options to create your function.

Author from scratch
Start with a simple Hello World example.

Use a blueprint
Build a Lambda application from sample code and configuration presets for common use cases.

Container image
Select a container image to deploy for your function.

Basic information

Function name
Enter a name that describes the purpose of your function.
FoodShelfLife

Function name must be 1 to 64 characters, must be unique to the Region, and can't include spaces. Valid characters are a-z, A-Z, 0-9, hyphens (-), and underscores (_).

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

▶ Additional Configurations
Use additional configurations to set up code signing, function URL, tags, and Amazon VPC access for your function.

Cancel **Create function**

Info Tutorials >

Learn how to implement common use cases in AWS Lambda.

Create a simple web app ^

In this tutorial you will learn how to:

- Build a simple web app, consisting of a Lambda function with a function URL that outputs a webpage
- Invoke your function through its function URL

Learn more ↗

Start tutorial

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Step 4: Click the function

The screenshot shows the AWS Lambda Functions page. On the left, there's a sidebar with 'Lambda' selected. The main area displays a table titled 'Functions (1)'. The table has columns for Function name, Description, Package type, Runtime, and Last modified. A single row is shown for a function named 'FoodShelfLife', which is a Zip package running on Python 3.9 and was last modified 27 seconds ago. A red arrow points to the 'FoodShelfLife' link in the Function name column. The top right of the page has tabs for 'Info' and 'Tutorials', with 'Tutorials' currently selected. A tutorial card for 'Create a simple web app' is visible on the right.

Function name	Description	Package type	Runtime	Last modified
FoodShelfLife	-	Zip	Python 3.9	27 seconds ago

Learn more about the Provisioned Mode for Kafka event source mapping (ESM)
A new feature that offers throughput controls and responsive auto-scaling for your Kafka applications

Last fetched 16 seconds ago

Actions Create function

Filter by attributes or search by keyword

Info Tutorials

Create a simple web app

In this tutorial you will learn how to:

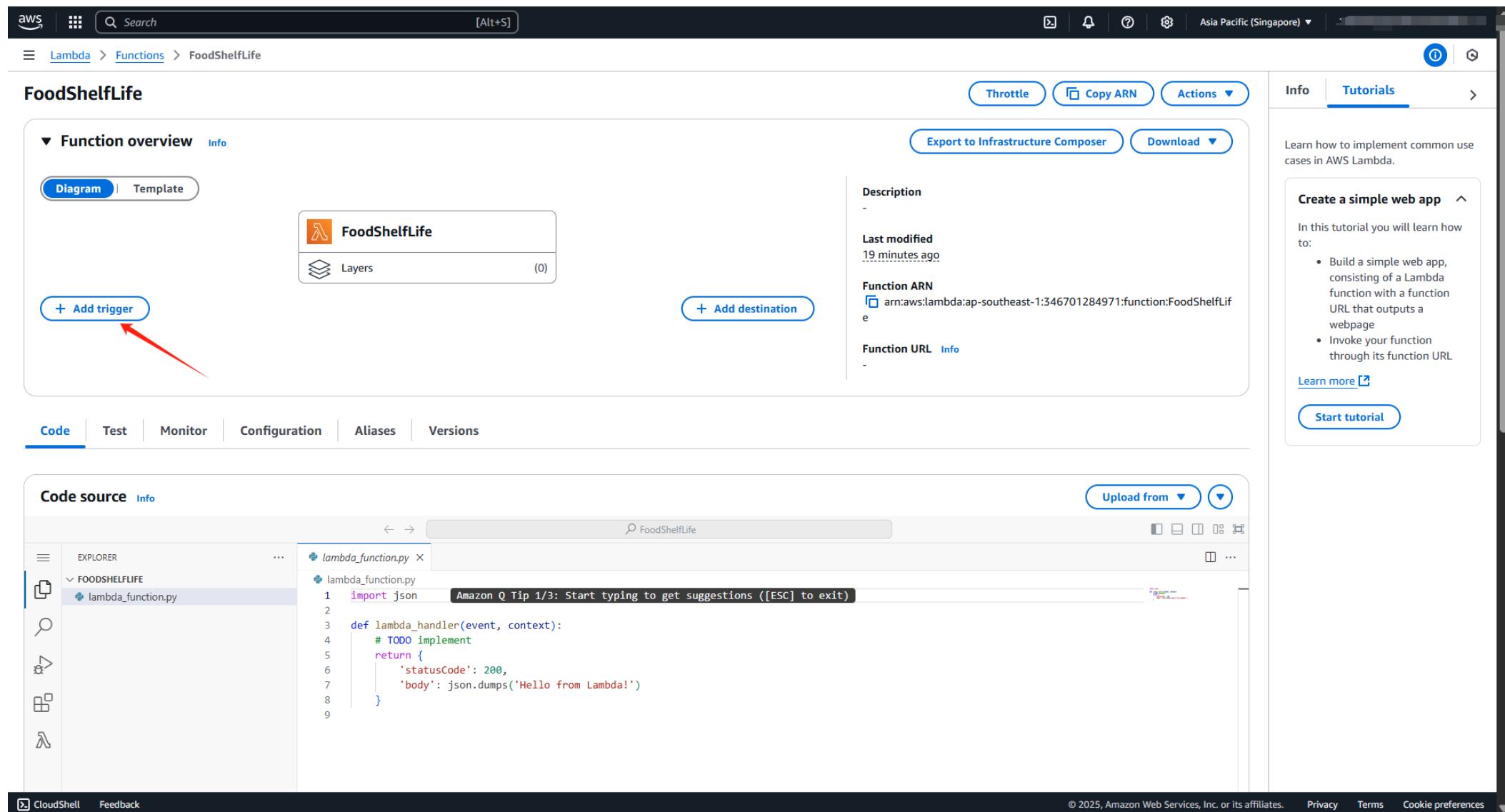
- Build a simple web app, consisting of a Lambda function with a function URL that outputs a webpage
- Invoke your function through its function URL

Start tutorial

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Step 4: Click “Add Trigger”



The screenshot shows the AWS Lambda Functions console. In the top navigation bar, the path is Lambda > Functions > FoodShelfLife. On the right side of the page, there is a sidebar titled "Tutorials" which is currently selected. It contains a section titled "Create a simple web app" with a brief description and a bulleted list of steps:

- Build a simple web app, consisting of a Lambda function with a function URL that outputs a webpage
- Invoke your function through its function URL

Below the sidebar, there is a "Learn more" link and a "Start tutorial" button.

The main content area displays the "FoodShelfLife" function overview. It includes a "Function overview" section with tabs for "Diagram" and "Template". A red arrow points to the "Add trigger" button, which is located below the "Diagram" tab. Other buttons in this section include "Layers" (0), "+ Add destination", and "Throttle". To the right of the overview, there are sections for "Description", "Last modified" (19 minutes ago), "Function ARN" (arn:aws:lambda:ap-southeast-1:346701284971:function:FoodShelfLife), and "Function URL". Buttons for "Export to Infrastructure Composer" and "Download" are also present. At the bottom of the overview section, there are tabs for "Code", "Test", "Monitor", "Configuration", "Aliases", and "Versions".

The "Code source" section shows the file "lambda_function.py" with the following code:

```
import json

def lambda_handler(event, context):
    # TODO implement
    return {
        'statusCode': 200,
        'body': json.dumps('Hello from Lambda!')
    }
```

At the bottom of the page, there are links for "CloudShell", "Feedback", "© 2025, Amazon Web Services, Inc. or its affiliates.", "Privacy", "Terms", and "Cookie preferences".

Step 5: First, select s3 as trigger, choose bucket that we will upload photo onto it and choose event type as “PUT” then click “Add”

The screenshot shows the 'Add trigger' configuration page for an AWS Lambda function. The 'Trigger configuration' section is selected, showing an S3 trigger setup. A red arrow points to the 'Bucket' input field, which contains the ARN of the S3 bucket: 's3/classify-images-console-ap-southeast-1-f84c5ac0ed1'. Another red arrow points to the 'Event types' section, specifically highlighting the 'PUT' option under 'All object create events'. A third red arrow points to the 'Add' button at the bottom right of the configuration form.

Trigger configuration [Info](#)

S3 aws asynchronous storage

Bucket
Choose or enter the ARN of an S3 bucket that serves as the event source. The bucket must be in the same region as the function.
s3/classify-images-console-ap-southeast-1-f84c5ac0ed1 [X](#) [C](#)

Event types
Select the events that you want to have trigger the Lambda function. You can optionally set up a prefix or suffix for an event. However, for each bucket, individual events cannot have multiple configurations with overlapping prefixes or suffixes that could match the same object key.

All object create events [X](#) PUT [X](#)

Prefix - optional
Enter a single optional prefix to limit the notifications to objects with keys that start with matching characters. Any [special characters](#) must be URL encoded.
e.g. images/

Suffix - optional
Enter a single optional suffix to limit the notifications to objects with keys that end with matching characters. Any [special characters](#) must be URL encoded.
e.g. jpg

Recursive invocation
If your function writes objects to an S3 bucket, ensure that you are using different S3 buckets for input and output. Writing to the same bucket increases the risk of creating a recursive invocation, which can result in increased Lambda usage and increased costs. [Learn more](#)

I acknowledge that using the same S3 bucket for both input and output is not recommended and that this configuration can cause recursive invocations, increased Lambda usage, and increased costs.

Lambda will add the necessary permissions for AWS S3 to invoke your Lambda function from this trigger. [Learn more](#) about the Lambda permissions model.

[Cancel](#) [Add](#)

[CloudShell](#) [Feedback](#)

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Step 6a: Scroll down and write code to trigger rekognition to identify image and send sns after detection

The screenshot shows the AWS Lambda Function Editor for the function 'FoodShelfLife'. A green success message at the top left states 'Successfully updated the function FoodShelfLife.' Below it, there's a section for triggers ('S3') with a '+ Add destination' button. On the right, the 'Info' tab is selected, showing the Function ARN (arn:aws:lambda:ap-southeast-1:346701284971:function:FoodShelfLife) and a 'Function URL' link. The main area has tabs for 'Code', 'Test', 'Monitor', 'Configuration', 'Aliases', and 'Versions', with 'Code' being the active tab. A red arrow points from the text above to the 'Code' tab. Another red arrow points to the 'lambda_function.py' file in the code editor. The code editor shows the following Python script:

```
lambda_function.py
1 import boto3
2 import json
3
4rekognition = boto3.client('rekognition')
5dynamodb = boto3.resource('dynamodb')
6sns = boto3.client('sns')
7
8# --- Configuration ---
9PROJECT_ARN = "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/1745147309410"
10PROJECT_VERSION_ARN = "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project."
11VERSION_NAME = "food_classify_project.2025-04-22T01.31.50"
12TABLE_NAME = "Food"
13SNS_TOPIC_ARN = "arn:aws:sns:ap-southeast-1:346701284971:Food_Recognition_Shelf"
14
15def lambda_handler(event, context):
16    try:
17        # Step 1: Get image info from S3 event
18        s3_record = event['Records'][0]['s3']
19        bucket = s3_record['bucket']['name']
20        image_name = s3_record['object']['key']
21
22        # Step 2: Start the model if not running
23        if not is_model_running():
24            start_model()
```

On the right side of the editor, there's a preview pane showing the execution results of the Lambda function. The right sidebar features a 'Tutorials' tab with a 'Create a simple web app' section, a 'Learn more' link, and a 'Start tutorial' button.

Step 6b: Write the below code into the lambda function python script. Replace arn to your own arn.

```
lambda_function.py x
lambda_function.py
1 import boto3
2 import json
3
4 rekognition = boto3.client('rekognition')
5 dynamodb = boto3.resource('dynamodb')
6 sns = boto3.client('sns')
7
8 # --- Configuration ---
9 PROJECT_ARN = "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classification"
10 PROJECT_VERSION_ARN = "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classification"
11 VERSION_NAME = "food_classify_project.2025-04-22T01.31.50"
12 TABLE_NAME = "Food"
13 SNS_TOPIC_ARN = "arn:aws:sns:ap-southeast-1:346701284971:Food_Recognition_Shelf"
14
15 def lambda_handler(event, context):
16     try:
17         # Step 1: Get image info from S3 event
18         s3_record = event['Records'][0]['s3']
19         bucket = s3_record['bucket']['name']
20         image_name = s3_record['object']['key']
21
22         # Step 2: Start the model if not running
23         if not is_model_running():
24             start_model()
25
26         # Step 3: Detect custom label (food type)
27         response = rekognition.detect_custom_labels(
28             ProjectVersionArn=PROJECT_VERSION_ARN,
29             Image={'S3Object': {'Bucket': bucket, 'Name': image_name}},
30             MaxResults=1
31         )
32
33         if response['CustomLabels']:
34             food_type = response['CustomLabels'][0]['Name']
35         else:
36             food_type = "Unknown"
37
38         # Step 4: Stop the model to save cost
39         stop_model()
40
41         # Step 5: Get shelf life from DynamoDB
42         try:
43             table = dynamodb.Table(TABLE_NAME)
44             db_response = table.get_item(Key={'food_type': food_type})
45             if 'Item' in db_response:
46                 shelf_life_value = db_response['Item']['shelf_life']
47                 shelf_life = f"({shelf_life_value}, days"
48
49             # Process and publish results
50             # ...
51
52         except Exception as e:
53             print(f"Error: {e}")
54
55     except Exception as e:
56         print(f"Error: {e}")
57
58 finally:
59     # Clean up resources
60     # ...
61
62     # Publish results to SNS
63     # ...
64
65     # Log final status
66     # ...
67
68     # End of function
```

```
    shelf_life_value = db_response['Item']['shelf_life']
    shelf_life = f'{shelf_life_value} days'
else:
    shelf_life = "Unknown"
except Exception as e:
    shelf_life = "Error fetching from DynamoDB"

# Step 6: Publish result via SNS
message = {
    "Image": image_name,
    "DetectedFood": food_type,
    "ShelfLife": shelf_life
}

sns.publish(
    TopicArn=SNS_TOPIC_ARN,
    Message=json.dumps(message),
    Subject="Food Recognition Result"
)

return {
    "statusCode": 200,
    "body": json.dumps({
        "message": "Success",
        "data": message
    })
}

except Exception as e:
    stop_model() # Ensure model is stopped if any error
    return {
        "statusCode": 500,
        "body": f"Error: {str(e)}"
    }
}

def is_model_running():
try:
    response = rekognition.describe_project_versions(
        ProjectArn=PROJECT_ARN,
        VersionNames=[VERSION_NAME]
    )
    for version in response['ProjectVersionDescriptions']:
        print(f"Model status: {version['Status']}")
```

```
lambda_function.py > 
lambda_function.py
81     def is_model_running():
82         try:
83             )
84             for version in response['ProjectVersionDescriptions']:
85                 print(f"Model status: {version['Status']}")
86                 return version['Status'] == 'RUNNING'
87             return False
88         except Exception as e:
89             print(f"Error checking model status: {e}")
90         return False
91
92     def start_model():
93         try:
94             print(f"Starting model: {PROJECT_VERSION_ARN}")
95             rekognition.start_project_version(
96                 ProjectVersionArn=PROJECT_VERSION_ARN,
97                 MinInferenceUnits=1
98             )
99             waiter = rekognition.get_waiter('project_version_running')
100             waiter.wait(ProjectArn=PROJECT_ARN, VersionNames=[VERSION_NAME])
101             print("Model started successfully.")
102         except Exception as e:
103             print(f"Error starting model: {e}")
104             raise
105
106     def stop_model():
107         try:
108             print(f"Stopping model: {PROJECT_VERSION_ARN}")
109             response = rekognition.stop_project_version(ProjectVersionArn=PROJECT_VERSION_ARN)
110             print(f"Model stopped. Status: {response['Status']}")
111         except Exception as e:
112             print(f"Error stopping model: {e}")
113
114
115
```

Step 7: Click “Deploy”

The screenshot shows the AWS Lambda console interface for the function `FoodShelfLife`. A green success message at the top states: "Successfully updated the function FoodShelfLife." On the left, there's a sidebar with tabs for `Code`, `Test`, `Monitor`, `Configuration`, `Aliases`, and `Versions`. The `Code` tab is selected. In the main area, under the heading "Code source", there's a file tree showing a project named `FOODSHELFIFE` containing a file `lambda_function.py`. Below the file tree, there are two buttons: "Deploy (Ctrl+Shift+U)" and "Test (Ctrl+Shift+I)". A red arrow points to the "Deploy" button. To the right of the code editor, there's a "Function ARN" field with the value `arn:aws:lambda:ap-southeast-1:346701284971:function:FoodShelfLife` and a "Function URL" field with a placeholder "-". On the far right, there's a sidebar titled "Tutorials" with a section for "Create a simple web app". It includes a list of steps: "Build a simple web app, consisting of a Lambda function with a function URL that outputs a webpage" and "Invoke your function through its function URL". There are also "Learn more" and "Start tutorial" buttons.

```
import boto3
import json

rekognition = boto3.client('rekognition')
dynamodb = boto3.resource('dynamodb')
sns = boto3.client('sns')

# --- Configuration ---
PROJECT_ARN = "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/1745147309410"
PROJECT_VERSION_ARN = "arn:aws:rekognition:ap-southeast-1:346701284971:project/food_classify_project/version/food_classify_project"
VERSION_NAME = "food_classify_project.2025-04-22T01.31.50"
TABLE_NAME = "Food"
SNS_TOPIC_ARN = "arn:aws:sns:ap-southeast-1:346701284971:Food_Recognition_Shelf"

def lambda_handler(event, context):
    try:
        # Step 1: Get image info from S3 event
        s3_record = event['Records'][0]['s3']
        bucket = s3_record['bucket']['name']
        image_name = s3_record['object']['key']

        # Step 2: Start the model if not running
        if not is_model_running():
            start_model()
```

Step 8: Go to Configuration->Permission->FoodShelfLife role

The screenshot shows the AWS Lambda Functions console. The URL is <https://ap-southeast-1.console.aws.amazon.com/lambda/home?region=ap-southeast-1#/functions/FoodShelfLife?tab=configure>. The function name is 'FoodShelfLife'. The 'Configuration' tab is selected. On the left, the 'Permissions' sidebar is highlighted with a red arrow. In the main content area, the 'Execution role' section shows the role name 'FoodShelfLife-role-w7l5s9n0' with a red arrow pointing to it. The 'Resource summary' table lists two resources: 'arn:aws:logs:ap-southeast-1:346701284971:' with actions 'Allow:logs>CreateLogGroup' and 'Allow:logs>CreateLogStream Allow:logs:PutLogEvents'. The 'Tutorials' sidebar on the right is also visible.

Step 9a: Set the related policies to the FoodShelfLife-role-w7l5s9n0

The screenshot shows the AWS IAM Roles page for the role **FoodShelfLife-role-w7l5s9n0**. The left sidebar is collapsed, and the main content area displays the role's summary and permissions.

Summary:

- Creation date:** April 22, 2025, 23:35 (UTC+08:00)
- Last activity:** 25 minutes ago
- ARN:** arn:aws:iam::346701284971:role/service-role/FoodShelfLife-role-w7l5s9n0
- Maximum session duration:** 1 hour

Permissions Tab: The **Permissions** tab is selected, indicated by a blue underline. A red arrow points to the **Policy name** search input field.

Permissions policies (4): You can attach up to 10 managed policies.

Policy name	Type	Attached entities
AllowSNSTopicPublish	Customer inline	0
AWSLambdaBasicExecutionRole-b7dd93af...	Customer managed	2
RekognitionAccess	Customer inline	0
S3GetAccess	Customer inline	0

Permissions boundary (not set):

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Step 9b: Set all these inline policies as shown in the pictures. Changes the arn to your own arn then click saves

Modify permissions in AllowSNSTopicPublish [Info](#)

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Policy editor

```
1 {  
2   "Version": "2012-10-17",  
3   "Statement": [  
4     {  
5       "Sid": "SNSAccess",  
6       "Effect": "Allow",  
7       "Action": [  
8         "sns:Publish"  
9       ],  
10      "Resource": "arn:aws:sns:ap-southeast-1:346701284971:Food_Recognition_Shelf"  
11    }  
12  ]  
13 }
```

Modify permissions in RekognitionAccess [Info](#)

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Policy editor Visual

```
1 {  
2   "Version": "2012-10-17",  
3   "Statement": [  
4     {  
5       "Sid": "RekognitionAccess",  
6       "Effect": "Allow",  
7       "Action": [  
8         "rekognition:StartProjectVersion",  
9         "rekognition:StopProjectVersion",  
10        "rekognition:DescribeProjectVersions",  
11        "rekognition:DetectCustomLabels"  
12      ],  
13      "Resource": "*"  
14    },  
15    {  
16      "Sid": "DynamoDBAccess",  
17      "Effect": "Allow",  
18      "Action": [  
19        "dynamodb:GetItem"  
20      ],  
21      "Resource": "arn:aws:dynamodb:ap-southeast-1:346701284971:table/Food"  
22    }  
23  ]  
24 }
```

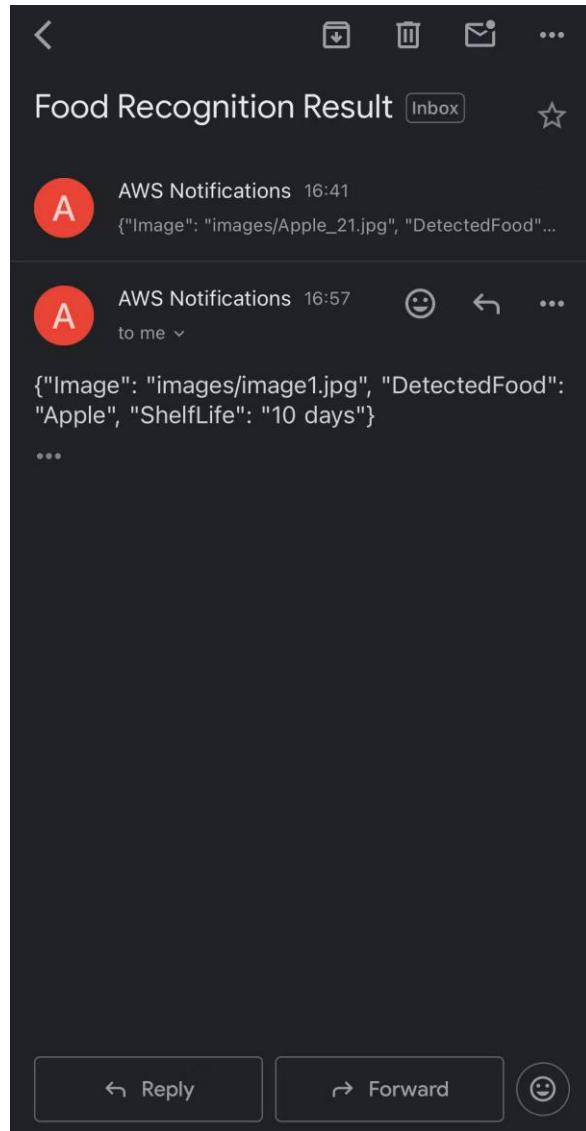
Modify permissions in S3GetAccess [Info](#)

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Policy editor Visual

```
1 {  
2   "Version": "2012-10-17",  
3   "Statement": [  
4     {  
5       "Sid": "S3Access",  
6       "Effect": "Allow",  
7       "Action": [  
8         "s3:GetObject"  
9       ],  
10      "Resource": "arn:aws:s3:::classify-images-console-ap-southeast-1-f84c5ac0ed1/*"  
11    }  
12  ]  
13 }
```

Step 10: After image is upload onto S3, message will be sent to user via email



Amazon SNS

Function : To display result of food type detection and its shelf life

Step 1: Search “SNS” on the search bar and click Simple Notification Service”

The screenshot shows the AWS search interface with the search bar containing "SNS". A red arrow points to the search bar. The search results are displayed under three main categories: Services, Features, and Resources.

- Services:**
 - Simple Notification Service** (highlighted with a red arrow)
 - Route 53 Resolver
 - Route 53
- Features:**
 - Events
 - SMS
 - Hosted zones
- Resources:** / for a focused search

A modal window titled "Create topic" is open on the right side of the screen. It contains a "Topic name" input field with "MyTopic" typed in, and an orange "Next step" button below it. Below the modal, there is a link "Start with an overview".

At the bottom of the left sidebar, there is a "Were these results helpful?" section with "Yes" and "No" buttons. At the very bottom, there are "Documentation" and "Use cases" sections.

The URL in the address bar is <https://ap-southeast-1.console.aws.amazon.com/sns/v3/home?region=ap-southeast-1>.

Step 2: Click Topic on the left side then click “Create Topic”

The screenshot shows the Amazon SNS console interface. On the left, a navigation sidebar lists "Amazon SNS" with "Topics" selected (indicated by a red arrow). The main content area is titled "Topics (0)" and displays a message: "No topics. To get started, create a topic." Below this is a "Create topic" button. At the top right of the main area, there are "Edit", "Delete", "Publish message", and a "Create topic" button (also highlighted with a red arrow). A blue banner at the top of the page announces a new feature: "Amazon SNS now supports High Throughput FIFO topics. Learn more". The top navigation bar includes the AWS logo, search bar, and region selector "Asia Pacific (Singapore)".

Step 3: Follow the configuration in the picture then scroll down and click “create topic”

The screenshot shows the 'Create topic' wizard in the AWS Management Console. The top navigation bar includes the AWS logo, a search bar, and a 'Topics' link under the 'Amazon SNS' section. A blue banner at the top indicates a 'New Feature' about High Throughput FIFO topics.

Details

Type | [Info](#)
Topic type cannot be modified after topic is created

FIFO (first-in, first-out)

- Strictly-preserved message ordering
- Exactly-once message delivery
- Subscription protocols: SQS

Standard

- Best-effort message ordering
- At-least once message delivery
- Subscription protocols: SQS, Lambda, Data Firehose, HTTP, SMS, email, mobile application endpoints

Name
Food_Recognition_Shelf
Maximum 256 characters. Can include alphanumeric characters, hyphens (-) and underscores (_).

Display name - optional | [Info](#)
To use this topic with SMS subscriptions, enter a display name. Only the first 10 characters are displayed in an SMS message.
My Topic
Maximum 100 characters.

Encryption - optional
Amazon SNS provides in-transit encryption by default. Enabling server-side encryption adds at-rest encryption to your topic.

Access policy - optional | [Info](#)
This policy defines who can access your topic. By default, only the topic owner can publish or subscribe to the topic.

Data protection policy - optional | [Info](#)
This policy defines which sensitive data to monitor and to prevent from being exchanged via your topic.

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Step 4: Click “Create Subscription”

The screenshot shows the AWS SNS console for the 'Food_Recognition_Shelf' topic. At the top, there's a blue banner with a new feature message about High Throughput FIFO topics. Below it, a green success message states 'Topic Food_Recognition_Shelf created successfully.' and encourages creating subscriptions. On the right, there are 'Publish message' and 'Edit' buttons. The main section displays the topic details: Name (Food_Recognition_Shelf), Display name (-), ARN (arn:aws:sns:ap-southeast-1:346701284971:Food_Recognition_Shelf), Topic owner (346701284971), and Type (Standard). Below this, a navigation bar includes 'Subscriptions' (which is active), 'Access policy', 'Data protection policy', 'Delivery policy (HTTP/S)', 'Delivery status logging', 'Encryption', 'Tags', and 'Integrations'. The 'Subscriptions' section shows 'Subscriptions (0)' and a table with columns: ID, Endpoint, Status, and Protocol. A red arrow points to the 'Create subscription' button at the bottom right of this section. The footer contains links for CloudShell, Feedback, and various AWS terms like Privacy, Terms, and Cookie preferences.

aws | [Alt+S] | Search | Asia Pacific (Singapore) |

Amazon SNS > Topics > Food_Recognition_Shelf

New Feature
Amazon SNS now supports High Throughput FIFO topics. [Learn more](#)

Topic Food_Recognition_Shelf created successfully.
You can create subscriptions and send messages to them from this topic.

Publish message X

Amazon SNS

Dashboard

Topics

Subscriptions

Mobile

Push notifications

Text messaging (SMS)

Food_Recognition_Shelf

Edit Delete Publish message

Details

Name: Food_Recognition_Shelf

Display name: -

ARN: arn:aws:sns:ap-southeast-1:346701284971:Food_Recognition_Shelf

Topic owner: 346701284971

Type: Standard

Subscriptions Access policy Data protection policy Delivery policy (HTTP/S) Delivery status logging Encryption Tags Integrations

Subscriptions (0)

Search

ID Endpoint Status Protocol

No subscriptions found
You don't have any subscriptions to this topic.

Create subscription

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Step 5: Choose protocol as “Email” and endpoint (your target user), then click “Create Subscription”

The screenshot shows the 'Create subscription' wizard in the AWS Management Console. The top navigation bar includes the AWS logo, search bar, and region selector ('Asia Pacific (Singapore)'). The breadcrumb path is 'Amazon SNS > Subscriptions > Create subscription'. A blue banner at the top indicates a 'New Feature' where SNS now supports High Throughput FIFO topics.

Details

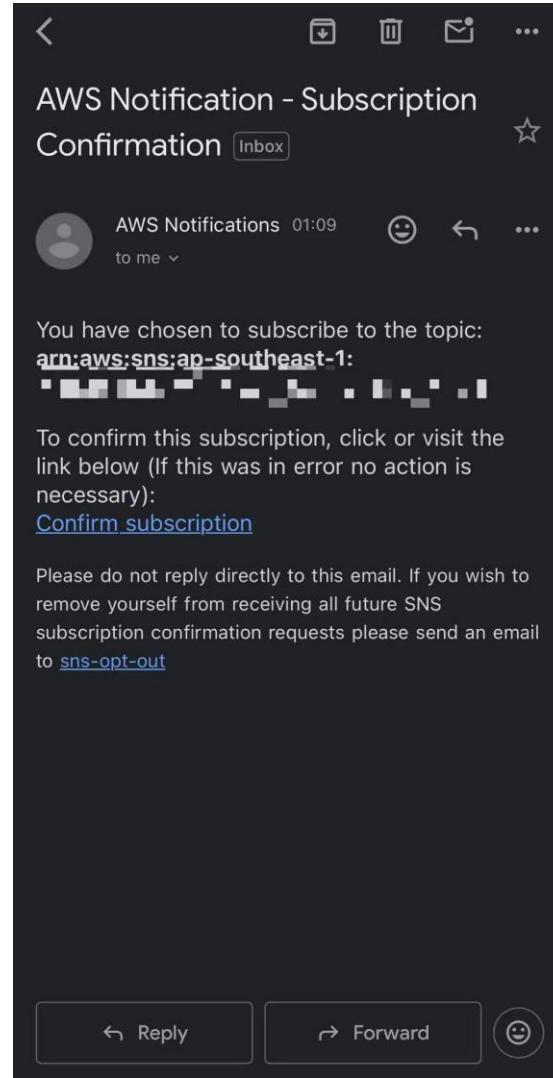
- Topic ARN:** (highlighted with a red arrow)
- Protocol:**
- Endpoint:**
- Note:** After your subscription is created, you must confirm it. [Info](#)

Subscription filter policy - optional [Info](#)
This policy filters the messages that a subscriber receives.

Redrive policy (dead-letter queue) - optional [Info](#)
Send undeliverable messages to a dead-letter queue.

Buttons at the bottom right: [Cancel](#) and [Create subscription](#) (highlighted with a red arrow).

Step 6: Find confirmation email, and click “Confirm Subscription”. Then, wait for the status changes to “Confirmed” before further operation



The screenshot shows the AWS SNS "Subscription: e9c25811-2430-4659-ac81-06867f4d8b6d" details page. The status is listed as "Confirmed" with a green checkmark. A red arrow points to this status field. The "Protocol" is set to "EMAIL".

Details

- ARN**: arn:aws:sns:ap-southeast-1:346701284971:Food_Recognition_Shelf:e9c25811-2430-4659-ac81-06867f4d8b6d
- Endpoint**: huangm871@gmail.com
- Topic**: Food_Recognition_Shelf
- Subscription Principal**: arn:aws:iam::346701284971:user/TheeYong

Subscription filter policy Info
This policy filters the messages that a subscriber receives.
No filter policy configured for this subscription.
To apply a filter policy, edit this subscription.

[Edit](#)

Appendix

Sample datasets used

Sample datasets used for model training and food recognition:

Dataset Reference Website:

<https://www.kaggle.com/datasets/sunnyagarwal427444/food-ingredient-dataset-51>

Thank You

-THE END-