AWS Practice Project: Deploy a Cost-Free Serverless Web Application

Project Overview

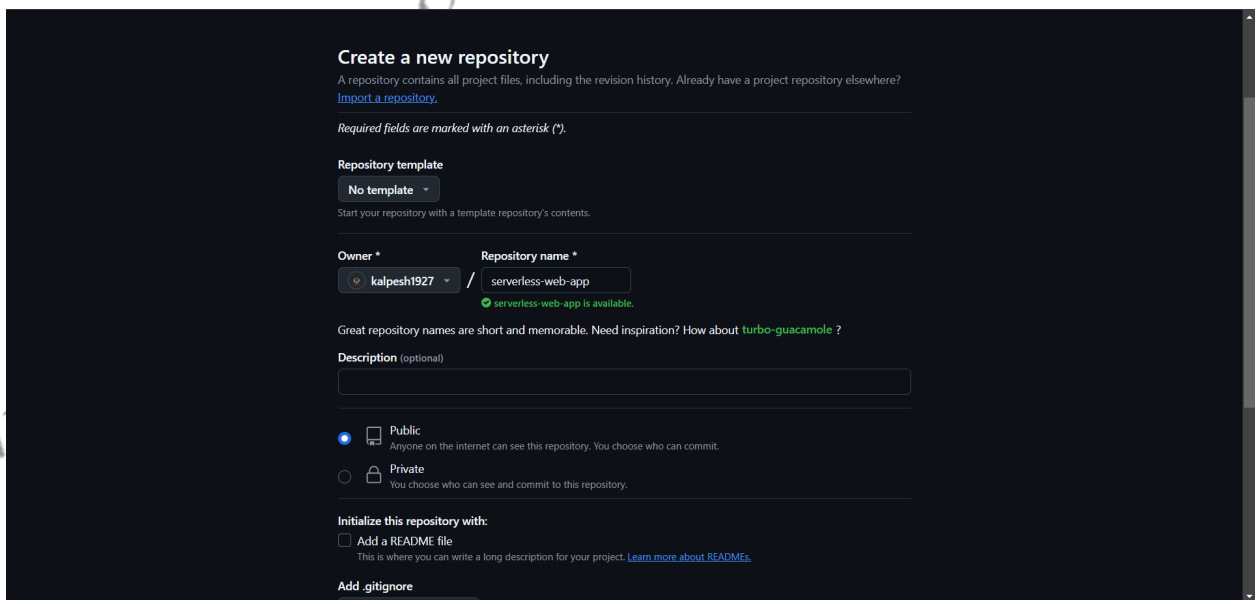
This project involves creating a simple serverless web application where users can submit feedback. The application will use **GitHub Pages** for free website hosting, **AWS Lambda (under Free Tier)** for backend logic, **Amazon API Gateway (within Free Tier limits)** for API management, and **DynamoDB Free Tier** for storing user feedback.

AWS Services Used (All Within Free Tier)

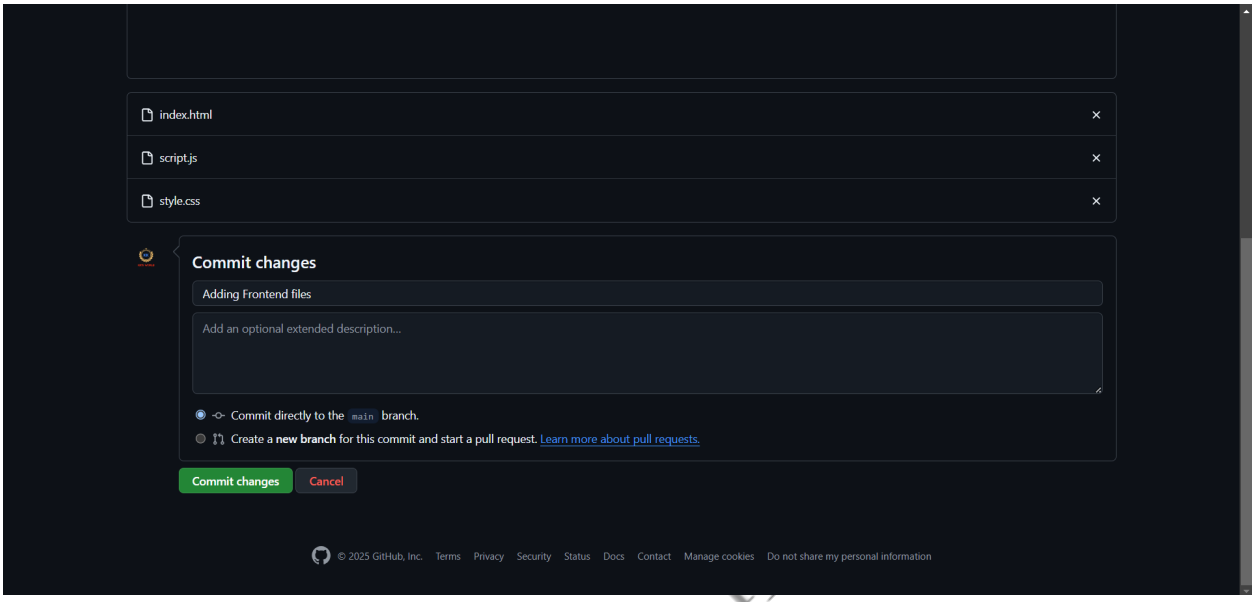
- **GitHub Pages** – Free hosting for the static website (Alternative to S3)
- **AWS Lambda** – Free Tier allows 1M requests/month
- **Amazon API Gateway** – Free Tier allows 1M API calls/month
- **Amazon DynamoDB** – Free Tier allows 25GB storage and 25 WCU/RCU
- **AWS IAM** – Manage permissions and security

Step 1: Host the Static Website on GitHub Pages (Free Alternative to S3)

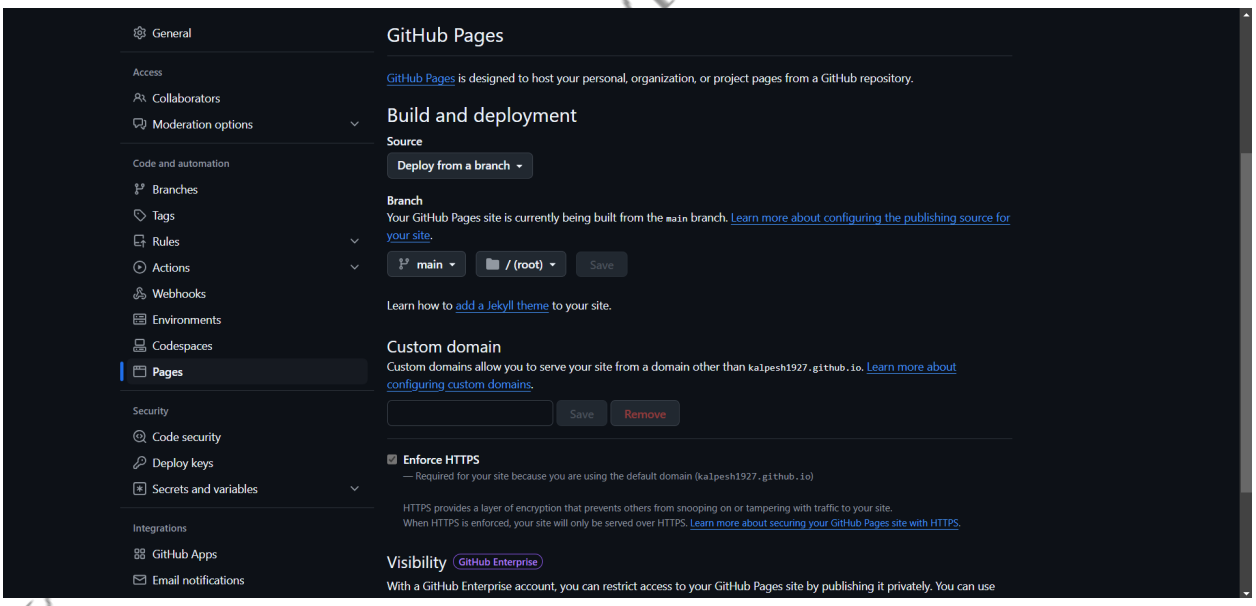
1. **Create a GitHub Repository** named serverless-web-app.



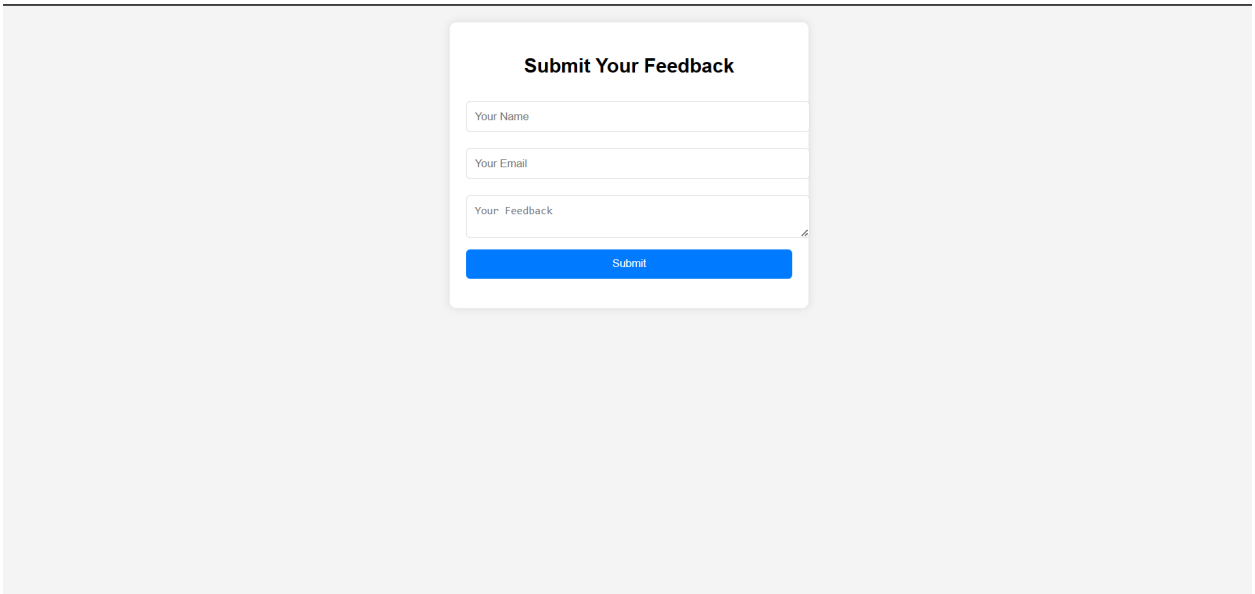
2. **Upload the frontend files** (index.html, style.css, script.js).



3. Go to **Settings → Pages** and select the main branch for deployment.

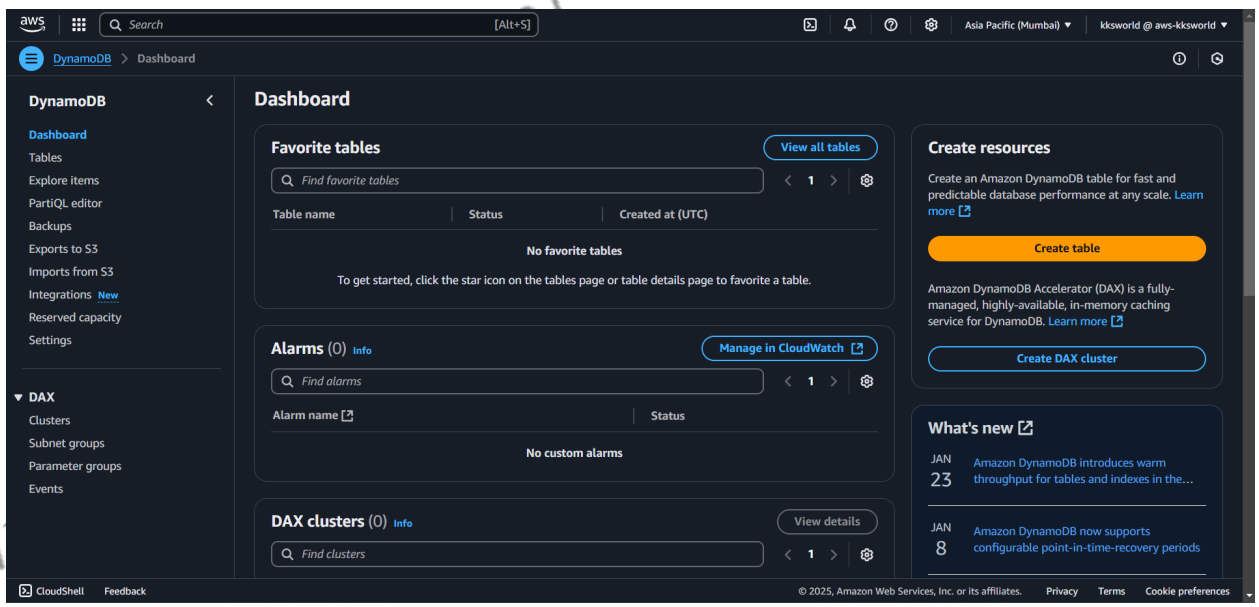


4. **GitHub will provide a free website URL (e.g., https://kalpesh1927.github.io/serverless-web-app/).**

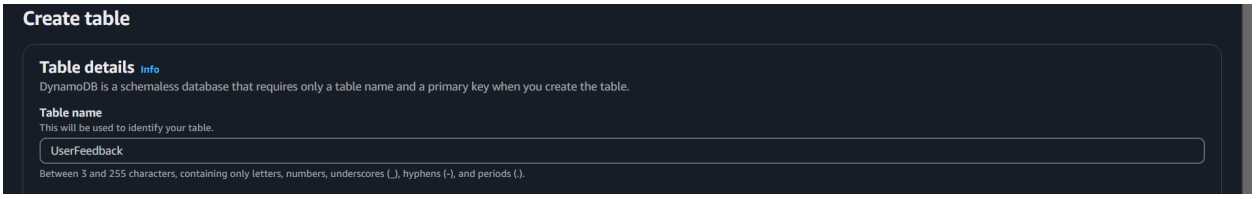


Step 2: Set Up a DynamoDB Table (Free Tier Limits)

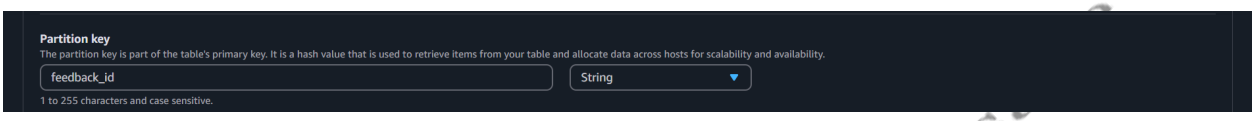
1. **Go to the AWS DynamoDB Console and create a new table.**



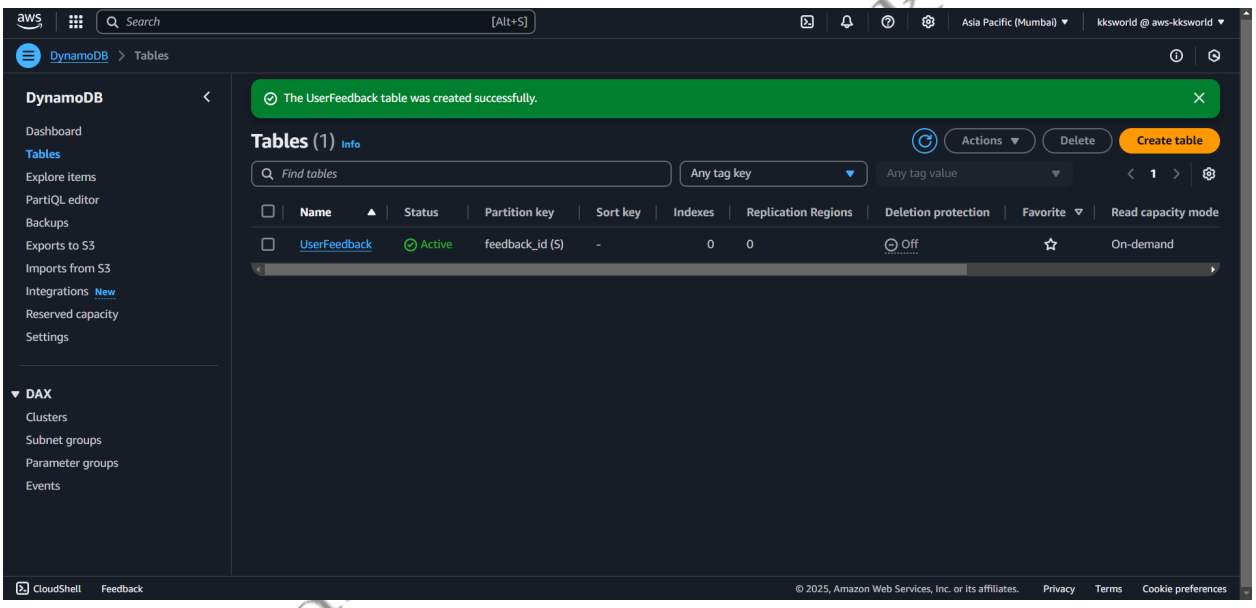
2. Table name: UserFeedback



3. Set **Partition Key** : feedback_id (String).

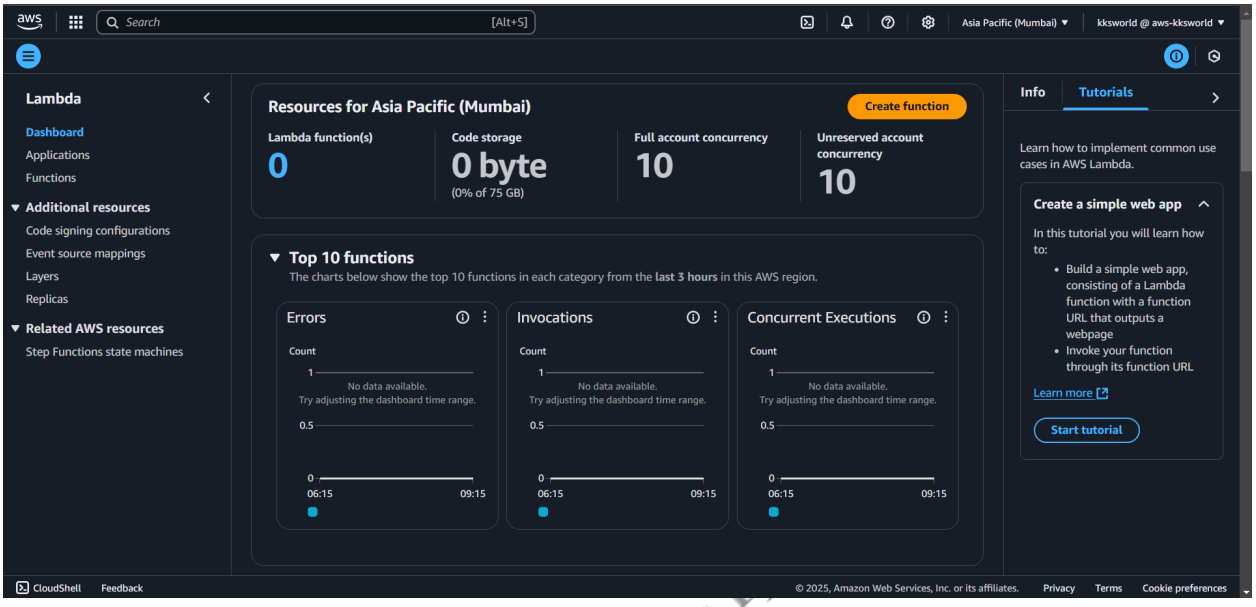


4. **Click "Create Table" and note the table name.**



Step 3: Create an AWS Lambda Function (Under Free Tier)

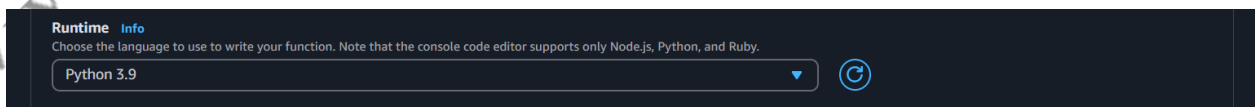
1. **Go to the AWS Lambda Console and create a new function.**



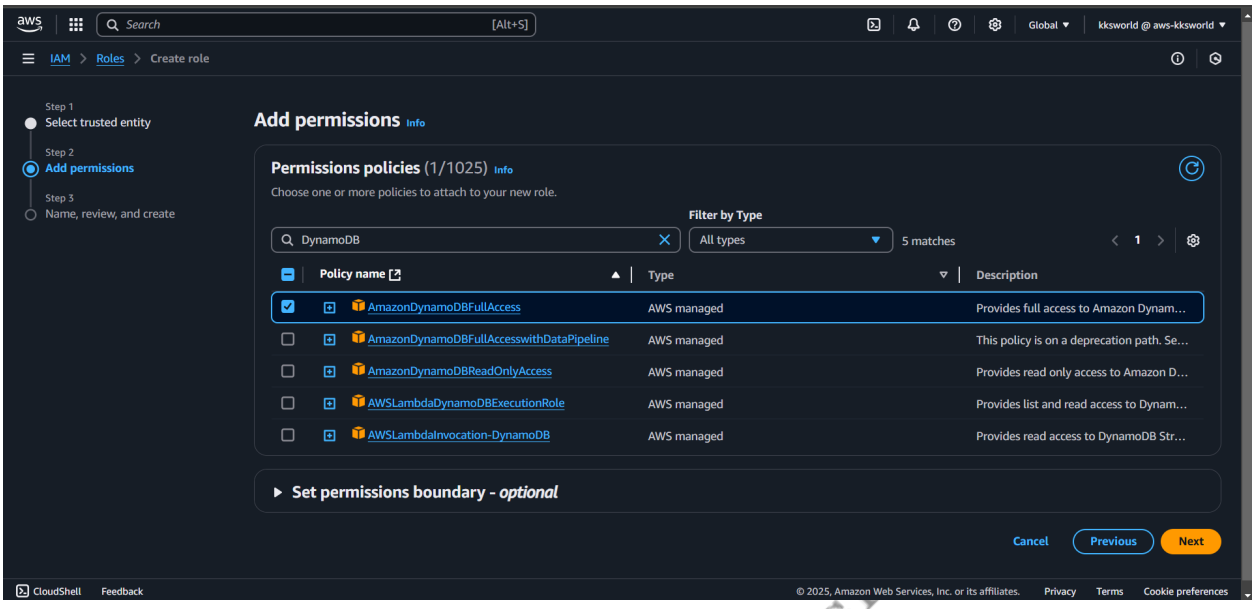
2. Choose **Author from scratch** .

3. Function Name: SubmitFeedback

4. Runtime: **Python 3.9** or **Node.js 18** .



5. **Create a new IAM role with DynamoDB Read/Write Access permissions.**



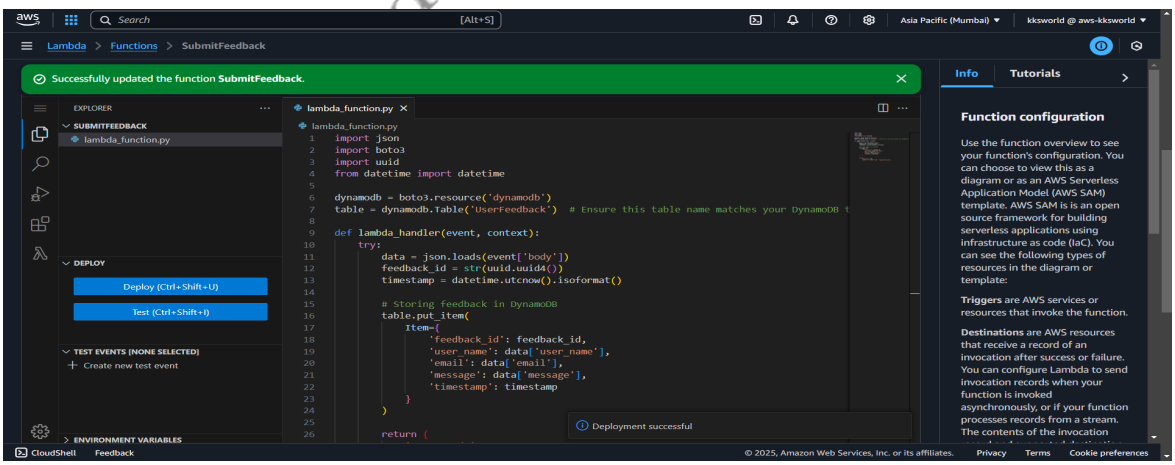
- **If "AmazonDynamoDBReadWriteAccess " is unavailable, search for AmazonDynamoDBFullAccess instead.**
- **This grants full control over all DynamoDB tables, which is not ideal for security.**

6. Add the following code to handle feedback submission:

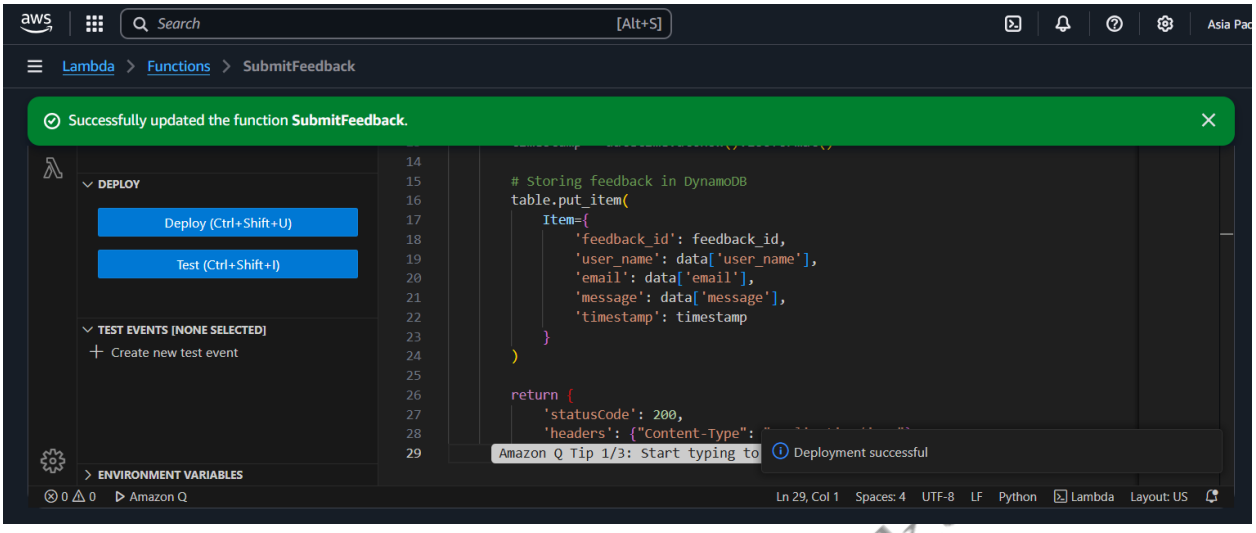
Python Code Example:

```
import json
import boto3
import uuid
from datetime import datetime

dynamodb = boto3.resource('dynamodb')
table = dynamodb.Table('UserFeedback')

def lambda_handler(event, context):
    data = json.loads(event['body'])
    feedback_id = str(uuid.uuid4())
```

```
timestamp = datetime.utcnow().isoformat()


table.put_item(
    Item={
        'feedback_id': feedback_id,
        'user_name': data['user_name'],
        'email': data['email'],
        'message': data['message'],
        'timestamp': timestamp
    }
)


return {
    'statusCode': 200,
    'headers': {"Content-Type": "application/json"},
    'body': json.dumps({'message': 'Feedback submitted successfully'})
}
```

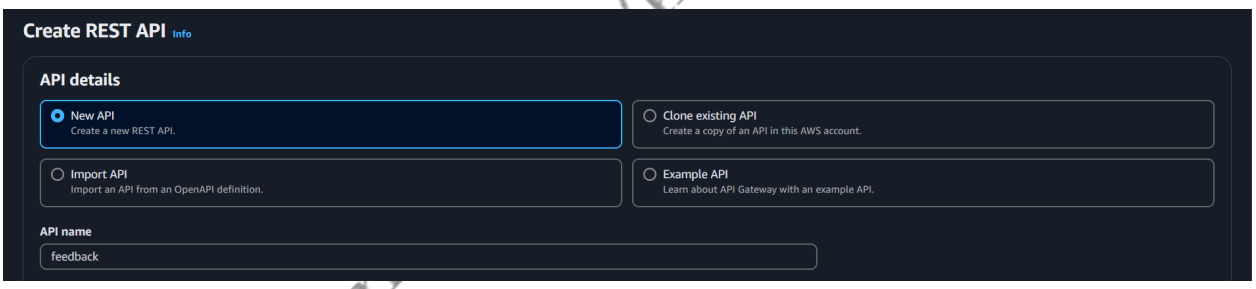



7. **Deploy the function and note the ARN.**

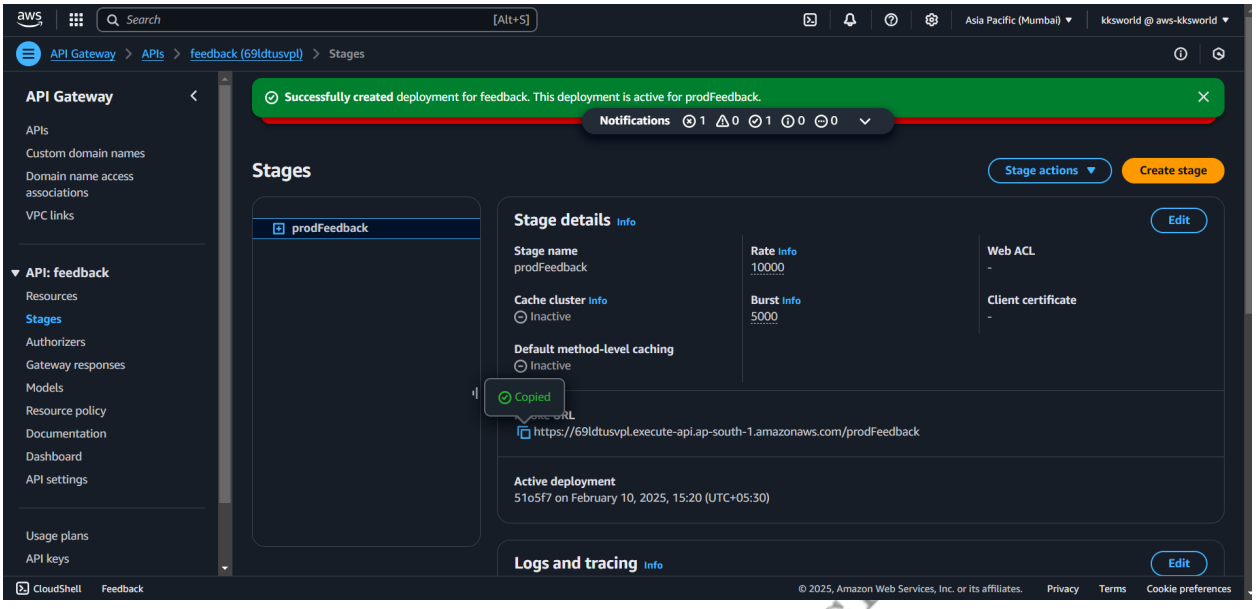


Step 4: Configure API Gateway (Free Tier Limits)

1. **Go to the API Gateway Console and create a new REST API.**
2. Create a **Resource**: /feedback.



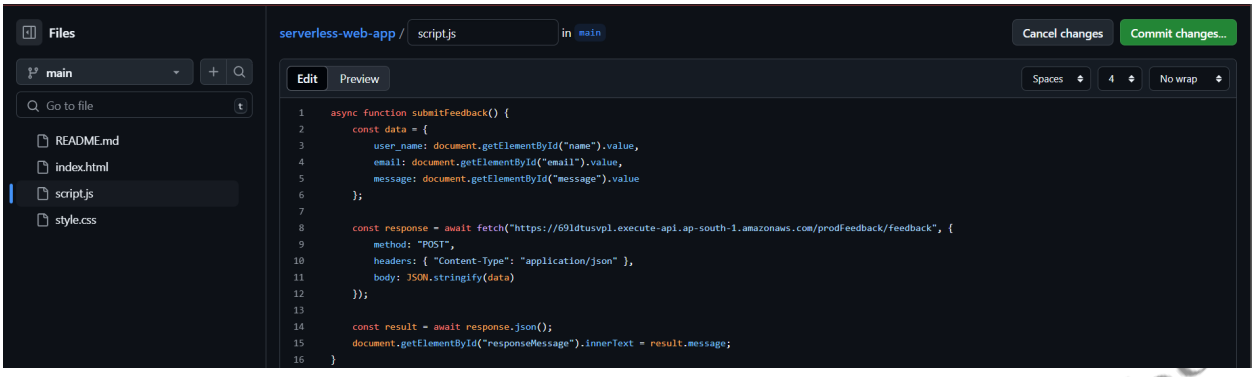
3. Add a **POST Method** and integrate it with your Lambda function.
4. **Deploy the API and note the Invoke URL.**



Step 5: Connect the Frontend to API Gateway

1. Update the script.js file to use the API Gateway **Invoke URL**:

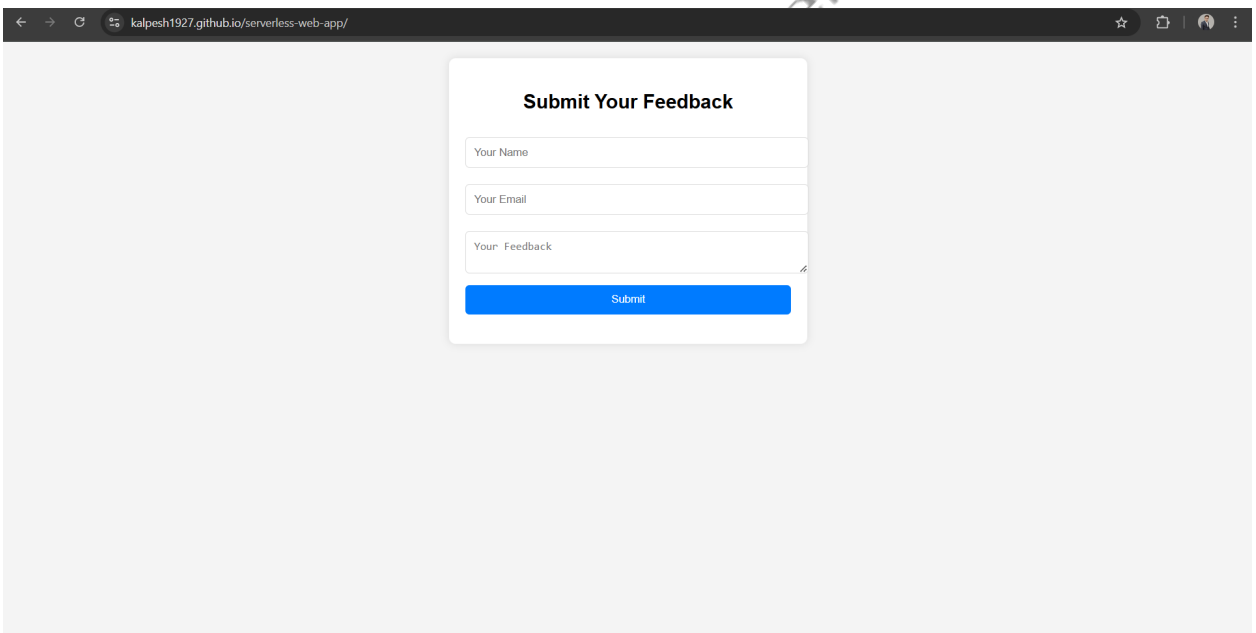
```
async function submitFeedback() {
  const data = {
    user_name: document.getElementById("name").value,
    email: document.getElementById("email").value,
    message: document.getElementById("message").value
  };

  const response = await fetch("YOUR_API_GATEWAY_URL/feedback", {
    method: "POST",
    headers: { "Content-Type": "application/json" },
    body: JSON.stringify(data)
  });
  const result = await response.json();
  alert(result.message);}
```



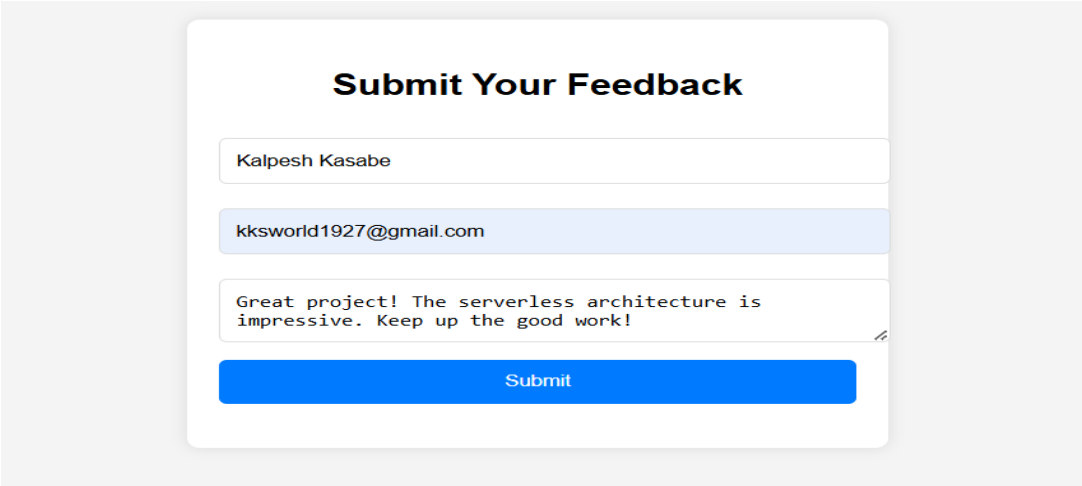
2. **Upload the updated script.js to the GitHub repository.**

Step 6: Test and Deploy

1. Open the **GitHub Pages URL** .



2. Submit feedback via the form.



3. Check the **DynamoDB Table** for the new entry.

4. **If successful, your serverless web app is live!**

Conclusion

You have successfully built and deployed a cost-free serverless web application using AWS and GitHub Pages. This project helped you understand GitHub static hosting, API Gateway, Lambda, and DynamoDB integration while staying within AWS Free Tier limits.

How to Avoid AWS Costs Completely:

1. **Monitor AWS Usage** via the AWS Billing Dashboard.
2. **Delete the API Gateway & DynamoDB Table** if no longer needed.
3. **Use Local Development Tools** like AWS SAM or LocalStack for testing.

Next Steps:

- Implement authentication using AWS Cognito (Free Tier Available).
- Add an email notification system using AWS SES (Free for first 1,000 emails/month).
- Enhance the frontend with better UI/UX.