Project Report: Building a Serverless Math Web Application Using AWS

1. Introduction

This project demonstrates how to build a serverless web application using AWS services. The application allows users to perform mathematical operations, specifically exponentiation. The computation is handled by AWS Lambda, and the results are stored in DynamoDB. The application is hosted using AWS Amplify, with API Gateway facilitating communication between the frontend and backend.

2. AWS Services Utilized

- AWS Amplify: Hosts the frontend of the application.
- AWS Lambda: Executes backend logic for mathematical computations.
- Amazon API Gateway: Interfaces between the frontend and Lambda.
- AWS IAM: Manages permissions and access control.
- Amazon DynamoDB: Stores computation results.

3. Application Architecture

1. Frontend: HTML page hosted on Amplify.
2. API Gateway: Routes requests to Lambda.
3. Lambda: Performs math operation.
4. DynamoDB: Stores the result.
5. Frontend: Displays result.

4. Implementation Steps

a. Frontend Development

- Create index.html for input.

- Add JS to send POST request.

b. Amplify Setup

- Init project and configure hosting.

- Deploy index.html.

c. Lambda Function

- Write function for math operation.

- Store result in DynamoDB.

d. API Gateway

- Create REST API with POST.

- Connect to Lambda.

- Enable CORS.

e. DynamoDB Setup

- Create table with primary key.

- Grant Lambda write access.

f. IAM Configuration

- Create role with DynamoDB permissions.

- Attach to Lambda.

5. Testing the Application

- Access frontend via Amplify.

- Submit base and exponent.

- Verify result and DynamoDB entry.

6. Conclusion

This project showcases a scalable, serverless application using AWS services.