

FINAL PROJECT 5317

TASK 1

Zip and submit the application folder based on your best effort.

The application folder should contain:

- ❖ A backend folder: lambda functions, etc.
- ❖ A frontend folder: darts files for client app, etc.

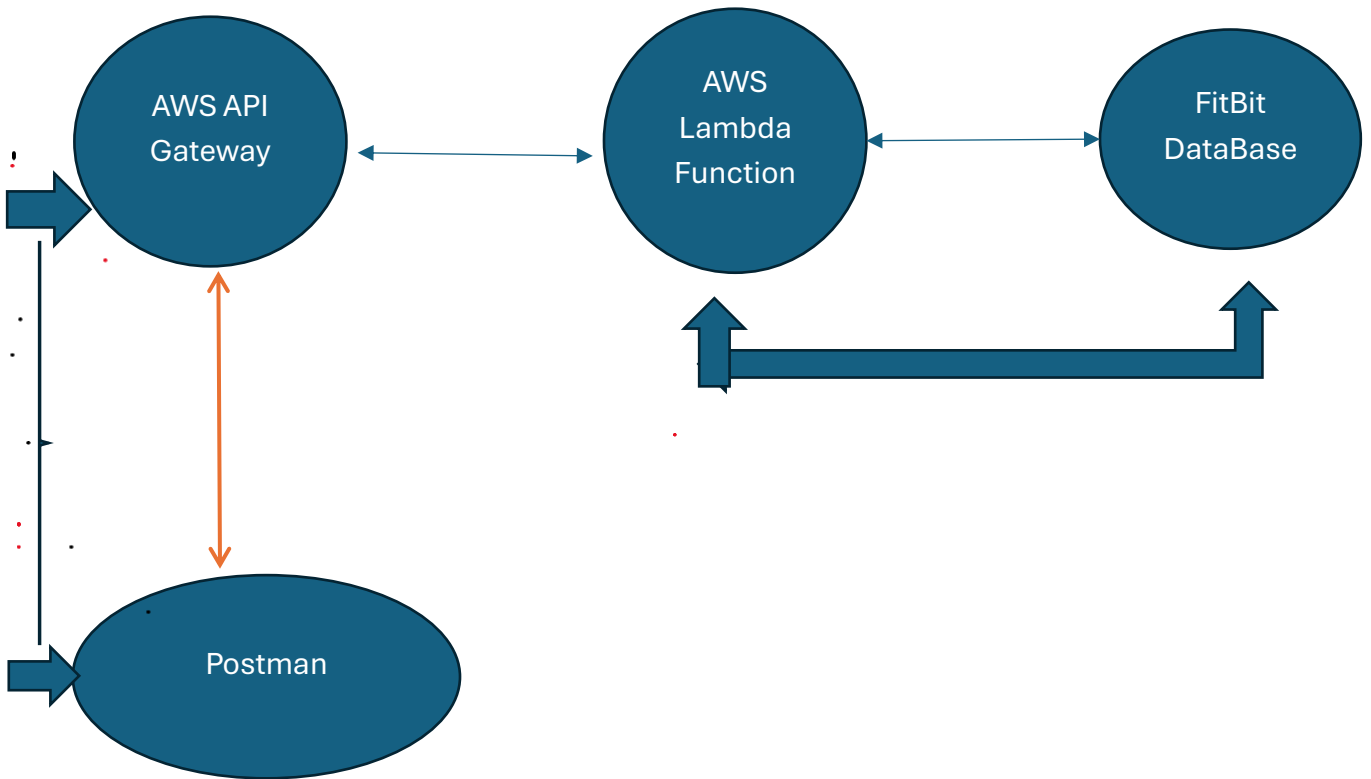
Answer- Backend folder and frontend code file are attached and submitted.

TASK 2

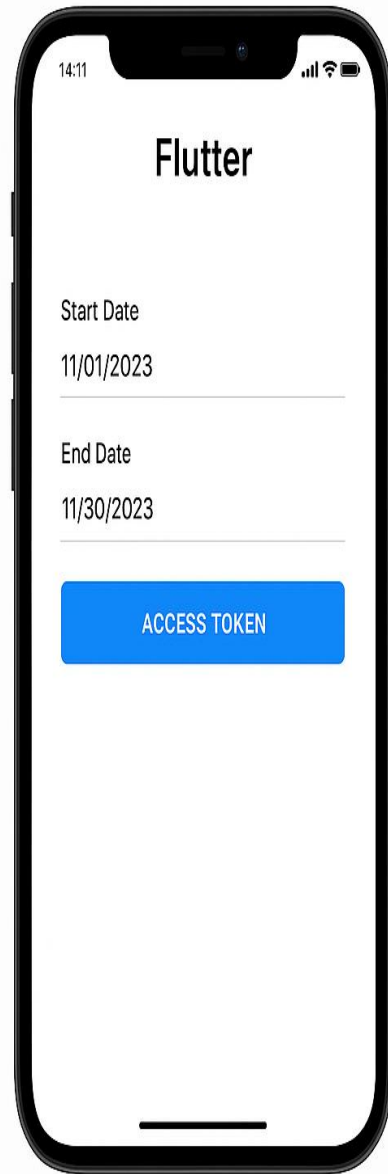
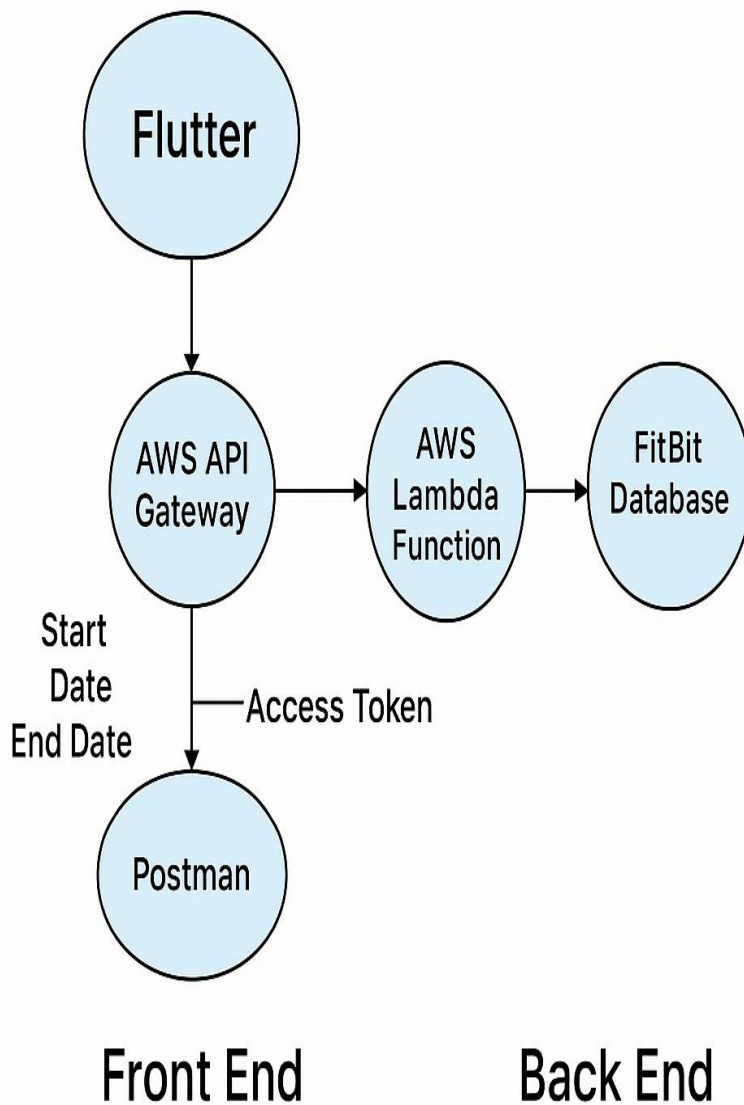
A Final report

Provide description of the overall architecture of your system consisting of main components, key functionality, and interactions with other components. Using a system figure to illustrate your design is preferable.

1.Back-end Architecture-



2. Front-end and Back-end Architecture -



System Architecture Overview

I designed to collect health data using the Fitbit API, process and store it using AWS services, and provide access to users through a Flutter-based frontend. It has the main component as below

-

Main Components & Key Functionalities-

Component	Technology	Key Functionality
Frontend	Flutter	Login/Logout, user interface to view health data (e.g., steps, heart rate), running in an emulator.
Backend	AWS Lambda	Serverless functions to manage business logic such as calling Fitbit API, storing/retrieving data.
Database	DynamoDB	NoSQL database stores user data and Fitbit health metrics.
API Gateway	AWS API Gateway	Connects frontend with backend, exposes secure REST APIs.
Fitbit Authorization	Fitbit API + OAuth2	Provides access token to get user health data securely.
Postman & Python	Tools	Used to assess Fitbit token request and API endpoints.

Interaction & Integration Flow

User Login:

User logs in via the Flutter app.

Access token is generated for secure communication.

Fitbit Authorization:

Flutter app initiates Fitbit OAuth2 login.

Fitbit returns an access token (stored securely).

Health Data Fetching:

Flutter app sends a request to API Gateway.

API Gateway invokes a Lambda function.

Lambda uses the Fitbit token to fetch health data via Fitbit API.

Data Storage:

Lambda processes Fitbit data and stores it in DynamoDB.

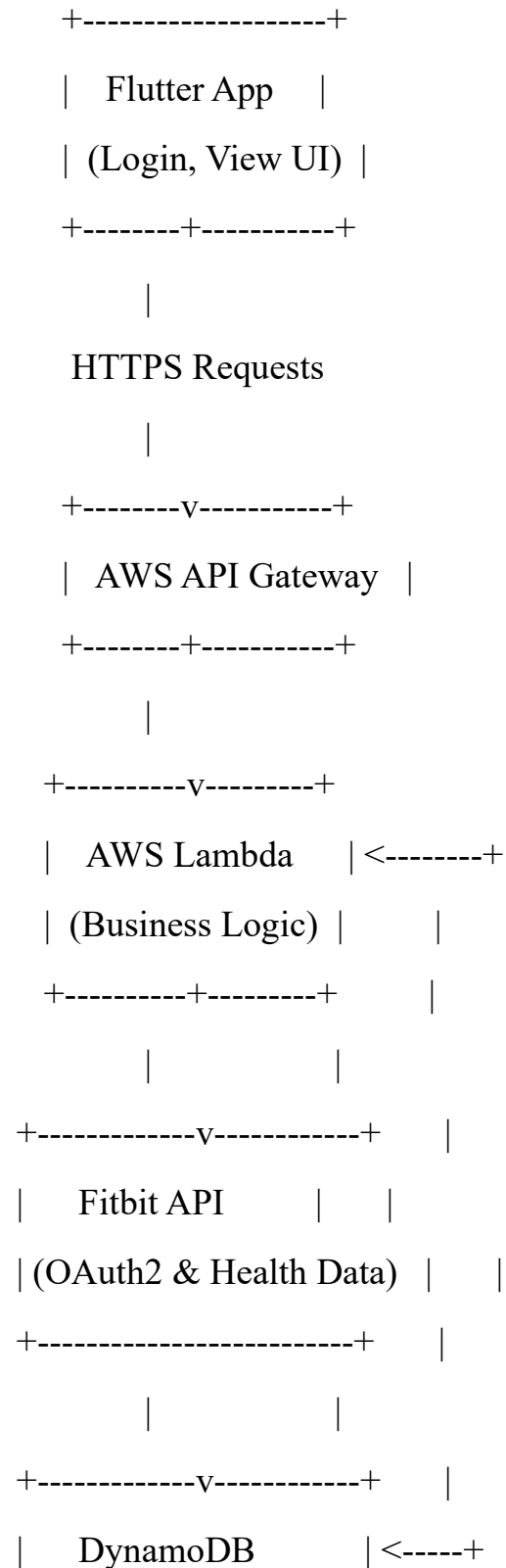
Data Viewing:

Flutter app sends another request to API Gateway.

Lambda retrieves data from DynamoDB.

API Gateway returns it to the app for display.

flutter development and integration with back-end in diagrammatic form-



| (Store User & Health Data)|

+-----+

TASK 2

B. Using a table to show the workload and responsibilities of your team members. For example:

Name	Role	Responsibilities	Task Descriptions
NIRAJ & RAJ. PRUDHVI	We both have done work together equally so we can say we both were leading the project and work as a team member it depends on the assignment and workload	heart rate, lambda, API development and other backend development, front end development, Figma design and run the flutter code, emulator and vs studio, view heart rate on flutter page	We both have done work together equally in front-end and back-end development. so, we can say we both are leading the project. Also, it was dependent on time commitment along with other assignments of other courses. Sometimes, I handle most of the part and sometimes it has been done by Prudhvi
RAJ S PRUDHVI &NIRAJ	We both worked together so I can say we both are team leader and	Coding to front end, design development as well back-end development,	code check and run as well discussed to gather that how to overcome the

	worked as a member also	develop the Figma design, run the code in emulator, google chrome and Figma design. Made flutter page	issue whenever faced the challenges like running and integration to understand the front end and backend development
--	-------------------------	---	--

C. Questions:

❖ **What was the most challenging part of this application development for you?**

Dear Sir,

The most challenging part for me/us was to understand the concept of how AWS works. Being a non-technical candidate and purely belonging to clinical background to understand the technical part and their co-relation such as lambda, Dynamo db., API and post was bit difficult. Sometimes, developing the code for front end and back-end development was also hectic. However, we are very fortunate that I found an amazing teacher in the form of you (Dr. Ronghua), and you're always there for students. Provide the guideline thought YouTube link and your code which was extremely beneficial and super easy for novice students.

❖ **How do you solve these problems in development and test stages?**

I followed the guidelines of my amazing teacher (Dr. Ronghua), watch video provided by him as well as many links and code development procedure are given by him. We also used ChatGPT after permission of the IOMT teacher to develop and run the code. We are very thankful, ultimately was developed successfully due to guidance of Ronghua sir.

