PERSONALIZED HEALTH AND WELLNESS ASSISTANT

ACTIVITY DIAGRAM &

SWIMLANE DIAGRAM

Course Title – Software Engineering

Slot – G2 + TG2

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Introduction –

The 'Personalized Health and Wellness Assistant' will serve as a new generation mobile application that will include artificial intelligence and machine learning components to suggest a recommended health and wellness plan based on data inputted by the user. This is a new concept which will include a chatbot and will assist the users with medication and prescription guidance; therefore, the usage of the app will be enhanced while appropriate health support will be provided. The most important one is to educate and give specific recommendations concerning the state of one's health and help to make the right decision.

To accomplish the mentioned above proposed objective of a well-structured and efficient manner of development, Software Development Life Cycle, namely the Incremental Model has been chosen. This way the application is develop in phases including this feedback of users and can be improved gradually by incorporating more features. Thus, when realizing the project in stages, it is also possible to ensure that each of the elements is functional and the final outcome is a usable application that will meet the needs of end-users. It also shows the concrete description of Incremental Model in the framework of the 'Personalized Health and Wellness Assistant', as well as naming all the activities of each phase and their outcomes.

Activity Diagram –

The activity diagram for the "Personalized Health and Wellness Assistant" project maps out the dynamic workflow of the system, depicting how users interact with the app and how the app processes inputs and delivers results. It begins with the user registering or logging in, after which they can access different features like filling out their profile details and providing health inputs such as symptoms. The next activity shows the user inputting symptoms into the app, which triggers the backend processes, where the machine learning model processes the given symptoms to predict possible diseases. The activity continues with the model making predictions based on the input and the results being displayed on the user's screen. The diagram also covers activities such as updating profile data and interacting with the Firebase database for data storage and retrieval. Additionally, there is a path where the user can engage with the chatbot for health advice. The diagram clearly showcases decision points like verifying login credentials or whether all required health data is provided, and it ends with either showing the prediction results or navigating back to the home screen. Through this visual flow, the activity diagram effectively illustrates the system's core functionalities and user interaction paths, outlining how tasks are completed in the system step by step.

Steps –

A. Start Point

> Add a start point to the diagram. This will be the beginning of the user's interaction with the app.

B. Registration

> Add an activity for **"Enter Registration Details"**.

> Add a decision point: **"Are the details valid?"**.

> Add two arrows: one going to **"Complete Registration"** if valid, and another going back to **"Enter Registration Details"** if invalid.

C. Login

> After registration, the user logs in. Add an activity: **"Enter Login Details"**.

> Add a decision point: **"Are login credentials valid?"**.

> If valid, proceed to **"Dashboard"**.

> If invalid, loop back to the login step.

D. Profile Management

> From the dashboard, the user can access their profile.

> Add an activity: **"View Profile"**.

> Add another decision point: **"Edit Profile?"**.

> If the user wants to edit, direct the flow to **"Edit Profile Details"**, followed by **"Save Profile Changes"**.

> Otherwise, return to the dashboard.

E. Health Data Input

> The next activity is **"Input Health Data"**, where the user enters information like symptoms, height, weight, etc.

> Add a decision point: **"Is data valid?"**.
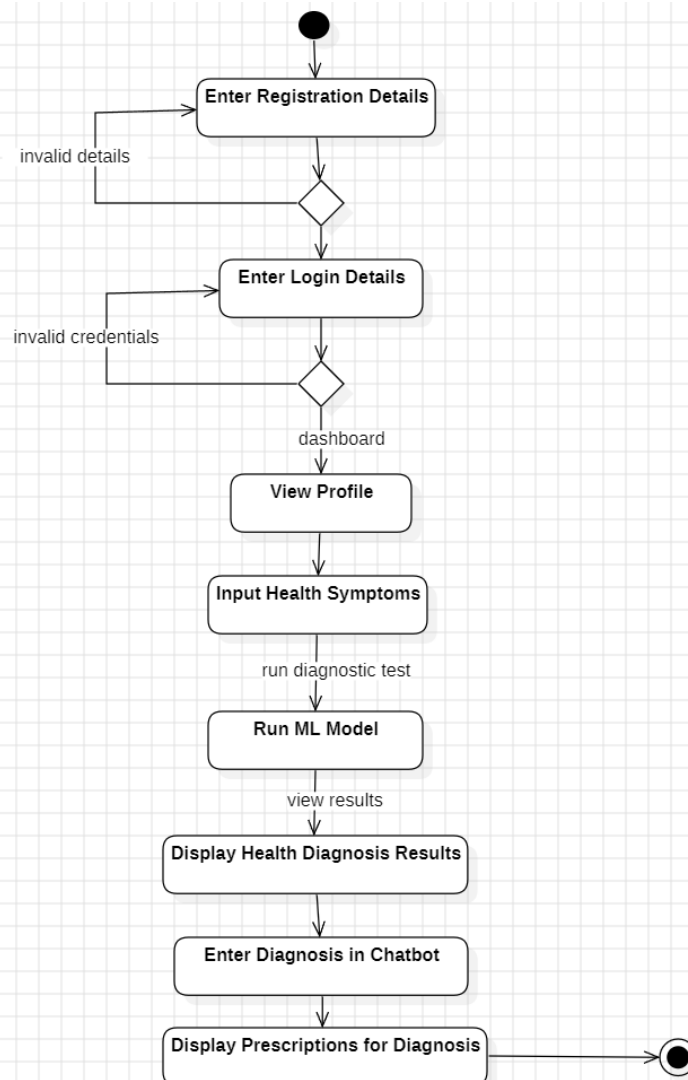
> ➢ If valid, move to **"Run Diagnostic Test"**.

F. Run Diagnostic Test

> ➢ Add an activity: **"Run ML Model"** to predict the health condition based on user input.

> ➢ The system processes the data, and the flow moves to **"View Diagnosis Results"**.

G. View Results

> ➢ Add an activity: **"Display Health Diagnosis Results"** where the system shows the predictions or diagnosis to the user.

Final Activity Diagram –

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Activity Diagram

Enter Registration Details

invalid details

Enter Login Details

invalid credentials

dashboard

View Profile

Input Health Symptoms

run diagnostic test

Run ML Model

view results

Display Health Diagnosis Results

Enter Diagnosis in Chatbot

Display Prescriptions for Diagnosis

Swimlane Diagram –

The swimlane diagram for the "Personalized Health and Wellness Assistant" project illustrates the flow of activities across different entities, dividing responsibilities into distinct lanes. The lanes typically represent the User, App Interface, Machine Learning Model, and Firebase Backend. In the User lane, the diagram captures user interactions such as registering, logging in, providing health details, selecting symptoms, and viewing results. The App Interface lane is responsible for managing user inputs, navigating through screens, sending inputs to the backend, and displaying the predicted results. The Machine Learning Model lane processes the inputs provided by the user (like symptoms), uses the trained model to predict possible diseases, and returns the predictions. Lastly, the Firebase Backend lane handles data storage and retrieval, managing tasks such as saving user profiles, storing health data, and fetching information as needed. This swimlane diagram provides a clear view of how tasks are distributed among these components, ensuring each entity's role is defined and showing how data and interactions flow across the system.

Steps –

1. Add Swimlanes (Partitions)

- ➢ On the diagram palette, look for the "Swimlane" tool.

- ➢ Drag and drop a Vertical Swimlane

- ➢ Rename each swimlane to represent the major participants in your project. Example swimlanes for your project might include:

  - • User (For user interactions)

  - • App Interface (For all the app UI and interaction logic)

  - • ML Model (For the machine learning model)

  - • Firebase Database (For storing and retrieving user data)

2. Define the Activities for Each Swimlane

- ➢ In each swimlane, add the relevant activity representing the actions taken by the actor.

- Use activity nodes (rectangles) to represent actions within each swimlane.

- Connect the activities with arrows to show the flow of actions between the actors.

3. **Lanes –**
   a) **User:**

   - Login/Register: User logs in or registers for the app.

   - Enter Medical Data: User provides input (symptoms).

   - View Results: User receives the prediction.

   b) **App Interface:**

   - Display Login/Register Screen: App interface shows login/register form.

   - Collect User Inputs: App collects data such as age, height, weight, and symptoms.

   - Send Data to ML Model: App forwards user input to the machine learning model for processing.

   - Receive Prediction: App receives the prediction from the ML model.

   c) **ML Model:**

   - Process Input Data: The machine learning model processes the user data.

   - Generate Prediction: The model outputs the predicted disease based on symptoms.

   d) **Firebase Database:**

   - Store User Data: Firebase stores the user registration details, medical inputs.

   - Retrieve User Profile: Firebase fetches user details when needed for display.

Final Swimlane Diagram –

Swimlane Diagram

User	App Interface	ML Model	Firebase

- Login
- Display Login Screen
- Retrieve User Profile
- Enter Medical Symptoms
- Collect User Inputs
- Store User Data
- Send Data to ML Model
- Process Input Data
- Generate Prediction
- Receive Prediction
- View Results