**Assignment 4**

**Name:** Utkarsh Bothe  
**Roll No:** 62  
**PRN:** 22311823  
**Subject:** Software Analysis and Design  
**Topic:** *To prepare detailed Activity diagram with notational compliance to UML 2.0 indicating clear use of pins, fork-join, synchronization, datastores*

**1. Problem Statement**

Design an **Activity Diagram** for the Fitness Tracker System that captures the workflow of a user performing key activities like logging in, using fitness services, tracking progress, and receiving notifications. The diagram should strictly follow UML 2.0 notation with:

* **Pins** for input/output data
* **Fork/Join** for parallel processing
* **Synchronization** for combining concurrent flows
* **Datastore** for saving and retrieving persistent data

**2. Activity Diagram Description**

**Flow of Activities:**

1. **Start** → User logs into the system.
2. **Decision:** Login successful or failed.
   * If failed → Retry login or exit.
   * If successful → Proceed.
3. **Fork:** System allows parallel activities:
   * **Track Fitness Activities** (steps, workouts, sleep)
   * **Track Nutrition** (food logging, water intake)
4. Both flows **synchronize** after completion.
5. Data from both flows stored into **Datastore (User Progress DB)**.
6. System generates reports & reminders.
7. **End State** → User gets summary & notifications.

**3. UML 2.0 Activity Diagram Elements Used**

* **Start Node** (●)
* **Activities/Actions** (rounded rectangles with input/output pins)
* **Decision/Merge** (diamond)
* **Fork/Join** (thick horizontal bars)
* **Datastore** (cylinder symbol)
* **End Node** (◎)

