Challenge 2025 – ADAMMA

Goal

Build an Android or iOS app that continuously predicts a user's current MET (Metabolic Equivalent of Task) class from smartphone accelerometer data and displays cumulative time spent today in each of the four classes:

- Sedentary (< 1.5 METs)
- Light (1.5–3 METs)
- Moderate (3–6 METs)
- Vigorous (> 6 METs)

The app must run on-device in near real time, with a clean UI that updates as time progresses. For this task, you are allowed to use public datasets, collect your data, and use any available AI tool. The only restriction is that you train and evaluate your machine learning model. The use of third-party sources has to be documented.

What is a MET class?

A MET is a simple unit that describes the energy cost of physical activities compared to resting.

- 1 MET = energy used when sitting quietly (your resting metabolic rate).
- Sedentary (<1.5 METs): sitting, lying, very minimal movement.
- Light (1.5–3 METs): slow walking, light household tasks.
- Moderate (3–6 METs): brisk walking, cycling at a casual pace.
- Vigorous (>6 METs): running, intense exercise, fast cycling.

By classifying time into these categories, you can measure how much of the day is spent being inactive versus physically active. Time spent in these activity classes predicts chronic disease risk and mortality.

What you'll deliver

1. Android app (APK/IPA + source) with:
2. Model + code:
   - A trained model
   - Feature extraction and post-processing pipeline.
3. Technical report (≤ 6 pages) covering software architecture & design, data, features, model, selection, evaluation, and scientific rationale.
4. Reproducibility: scripts/notebooks for training and evaluation on the dataset used

Submission

- **Git repo** (Android app + model + training code).
- **APK/IPA** for test install.
- **Report (PDF)** with results and design decisions.
- **Short demo video** (≤ 3 min) showing live updates & history.