### **Project Title: AI-Powered Fitness Coach with Real-Time Form Correction and Wear OS Integration**

#### **Project Overview**

This project focuses on the development of an intelligent mobile application designed to serve as a comprehensive personal fitness companion. The system leverages advanced computer vision and machine learning algorithms to analyze a user's exercise form in real-time, providing **immediate, corrective feedback through clear audio instructions and visual guides** to maximize workout efficacy and prevent injuries.

Furthermore, the application delivers a highly personalized experience by generating custom workout plans based on individual biometrics, body type analysis, and fitness goals. By integrating with Wear OS, the system offers enhanced real-time biometric tracking. All user data is centrally managed and visualized, creating a holistic, data-driven tool for users to effectively track and achieve their fitness objectives.

#### **Core Features and Functionalities**

* **Real-Time Pose Estimation and Form Correction:**
  + Utilizes the device's camera to capture user movements during exercise.
  + A computer vision model performs real-time pose estimation to analyze key body joints and angles.
  + The system compares the user's form against a model of correct posture and provides instantaneous, corrective feedback through both **spoken audio cues** (e.g., "Lower your hips," "Keep your back straight") and on-screen visual guides.
* **AI-Driven Personalized Workout Generation:**
  + Onboarding process includes capturing user biometrics (age, height, activity level) and an optional body image.
  + A machine learning model analyzes this data to identify the user's body type and recommends a tailored workout regimen aligned with their desired fitness goals (e.g., weight loss, muscle gain).
* **Cloud-Based Progress Tracking and Visualization:**
  + A central Firebase database securely stores user profiles, workout history, and progress metrics.
  + The application features an intuitive dashboard with dynamic charts and graphs to visualize user progress over time, enhancing motivation and engagement.
* **Wear OS Integration for Biometric Monitoring:**
  + Seamless integration with a Wear OS smartwatch for collecting real-time biometric data, such as heart rate and calories burned.
  + Ensures robust data synchronization between the wearable device and the mobile application, providing a complete overview of the user's performance during a workout session.