PiSonal Trainer: Weight Lifting Performance Tracker
Proof of Concept Plan

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Significant Risks

The majority of the risks associated with PiSonal Trainer relate to the implementation and hardware quality, specifically:

1. Implementation

   - Detection of movement may not be accurate although the object is recognized in the image
   - Designing an effective database schema

2. Camera

   - Object detection depends on how well markers are displayed in the image. Three aspects of the objects in relation to the camera are significant:
   - Low image resolution may impact the object recognition in videos, thereby causing inaccurate results
   - Colour used to track objects needs to stand out in order to be detected and differentiated from other objects in the camera's view
   - Distance of objects from the camera may negatively affect object detection

3. Other

   - Ensuring privacy of user information
   - Assuming the server will be running at all times, its reliability is a significant risk
   - Technologies used for implementing and hosting the application may be costly

Demonstration Plan

For our proof of concept demonstration, we will create a prototype of PiSonal Trainer to show that the previously mentioned risks can be overcome. The demonstration will include key components of the project, specifically:

- Object detection using OpenCV and a Macbook webcam. We will use algorithms (written in Python) to demonstrate that the camera-related risks can be mitigated under specific constraints. The constraints include minimal resolution required for images, colour and general appearance of object trackers, and maximum distance of trackable object from camera.

- A partial implementation of the algorithm which counts movement repetitions based on image recognition of the camera.

- Semi-finalized list of technologies which will be used in our final product, and a plan for interfacing them with each other. Categories include database service, server hosting platform, and libraries, among others.