Exercise Classifier

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Goal

- Differentiate between activities such as pushups, pullups, planks, or other exercises.
- Count the number of these events
- Report back to the user to help track fitness
- Use data to estimate how many calories were burned

Sensors

We will primarily use accelerometer data, and perhaps use the gyroscope as well. This will be because most exercises involve some sort of force being applied, and the accelerometer will detect this. The gyroscope will differentiate between activities with similar accelerations, but different orientations.

This data will be collected using a phone in the pocket.

Process

We will use machine learning principles to characterize the different types of exercises. Since our project does not involve detecting anything harmful or dangerous, and which many people do very frequently, we will be able to gather a large amount of data (relatively speaking) to feed into our model.

Features such as mean acceleration for something like push ups vs. planks, variance for short (time) jumping jacks vs. longer weight lifting, dominant orientation (assuming a stable sensor location) for sit ups vs. standing exercises

We will use frequency-domain filtering on the two sensors' data so that we can then them to determine the users orientation and movement.