2019 Princeton Start-Up Immersion Program
Applicant Challenge - Mechanical Engineering

Overview
Thank you for your interest in interning with Kinetic. As a part of the application process, we ask that you complete the following challenge. It should take approximately 3-4 hours and should be delivered in the form of a PPT or PDF.

About Kinetic
We are a New York City based start-up that works to reduce the number of unsafe postures and back breaking maneuvers in our workforce. We’ve found a lot of interest across various industries including shipping, manufacturing, construction, and even the insurance industry. Our main product is a device we call “the Reflex”: a wearable device that can automatically detect unsafe postures, and provides immediate feedback to workers when a high-risk motion occurs. The device clips onto one’s belt, and statistically infers when unsafe postures occur using accelerometer and gyroscope readings.

Questions:

1. [~3 hrs] Imagine you’re tasked with evaluating prototypes of five of the newest secret “ePhone” prototypes in development at “Pear Company”. Your job is to find out which ones are the most dependable in the hands of consumers. List all the ways you can break the phone (i.e. all the failure modes) as well as how you would test and evaluate the prototypes against those criteria. If you can, be as specific as possible on your test procedures and on what results you would deem passable. Please also label which failure modes are the most concerning and include your rationale.

2. [~1 hr] Let’s imagine one of the failure modes above is your “ePhone” bends too much. If the internal electronics are fixed and unchangeable, what things would you look into to resolve this? Focus on the enclosure. Include any formulas if you used them and notes on what changes would be the most promising and why.