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## How to Use Data Science in Real-Life

### **Project Goals:**

The goal of this project is to answer the question: How can we use data science to estimate real-life parameters like the coefficient of kinetic friction?

We will base our research on live data and collect information using the PyDuinoBridge library. The PyDuinoBridge library allows for easy communication between Python programming and Arduino circuitry.

We will be using an Arduino microcontroller and an ultrasonic sensor to collect the data, so this library will allow us to effectively collect and use our data.

### **Data Set:**

The data set will be collected using an Arduino and ultrasonic sensor. The sensor can collect approximately 30 points/second, so we expect to collect around 300 points.

The plan is as follows: Push a cart along the table towards the sensor and begin collecting data. We will measure the time and position of the cart with the Arduino. The time and position data will be used to derive velocity and acceleration. Once acceleration is derived, we can use linear regression to find the coefficient of kinetic friction.

We will have a recorded data set for use as a reference during our presentation, but we also will use a live demo during class.