LEGO SPIKE Prime Hardware Build

Time to complete
10-20 minutes

Requirements
LEGO SPIKE Prime kit

Font Notes:

- All references to other portions of the project are **bold and underlined**

Getting Started
This portion of the project will teach how to build the system that will be used for this project using the LEGO SPIKE Prime set. To get accurate results from the **Fast Fourier Transform activity**, please produce a setup with the requirements listed below. There can be additional parts to be added to the build, if chosen to do so, in the **Learn About IOT Using Airtable** portion of this project. These will be loose guidelines to promote creativity with the LEGO build.

If only the **Learn About IOT Using Airtable** portion of the project is going to be completed, there is not a specific build that will need to be created for the SPIKE Prime, but this document will create a build that can satisfy both activities.

The Build
To set up the LEGO SPIKE Prime set for the **Fast Fourier Transform activity**, there are a few key parts that are needed to complete this project correctly; the LEGO SPIKE Hub, one of the large motors, and a wheel. The SPIKE Hub is the computerized part of the kit that will be communicating with Vuforia Spatial Toolbox and the large motor will have the wheel connected to it which will be producing the vibrations that will be analyzed in the Fast Fourier Transform.

It is necessary for the wheel to be weighted to simulate the different movement that an airplane engine would go through while it is running, since the pistons would always be moving in a different direction throughout their strokes. For this project, a connecting link with two bricks on its end has been added to simulate a weight while only using the LEGO SPIKE Prime Kit. Kits can be built in any way, but here is an example of how this kit can be set up for simulating the motion of an airplane engine. Just remember to place the wheel high enough off the ground so that it can properly rotate without interference.

Part of the **Fast Fourier Transform activity** will involve changing designs to see their effect on the FFT analysis, so multiple design ideas are encouraged!