Asset Tracking
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Implementation
- Locators constantly report to a database over WiFi the signal strength of all of the beacons that are connected to them.
- Python script was developed to:
  - Retrieve data from database
  - Calculate distance between beacon and locator for each of the locators using signal strength
  - Output position map of beacon using trilateration

Results
- Distance calculation is inaccurate at longer distances and when obstacles are in the way of the signal path.
- Bluetooth asset tracking is optimal in open environments like a single room in a building like a warehouse.
- Trilateration-based asset tracking should not be used as a final solution. However, it can be used to assist triangulation-based asset tracking.

Our Goal
- Use Bluetooth waves from antennas and receivers to pinpoint a device's location within a building to a high degree of accuracy
- GPS is not accurate enough for what we want, so we can’t use it. However, we can implement some of the strategies it uses.
- Use cases: Warehouses, hospitals, construction

Our Second Approach - Triangulation
- Use angle of arrival from different locators around a room to triangulate the location of a device
- Much more accurate, as it relies on angles rather than signal strength, but more difficult to calculate and implement

Issues
- Within each locator, antennas receive data in a switching pattern, making it necessary to interpret which antenna is receiving data
- Identifying and removing outliers

Successes
- Figuring out how to interpret the data we’re given and what we need to do in order to get an accurate location
- Getting the phase angles from the data we are given
- Calculating the final angle of arrival, which can be used for triangulation

How do we find the position using Triangulation/Angle-of-Arrival?

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