Group Name: TBD (Tracking Bombing Data)
Tyler Amos, Sasha Tyan, Kevin Sun, Ishaan Bhojwani

Data used:
- United Nations Institute for Training and Research's UNOSAT Handcoded data for Damage Assessment in (urban) conflict zones (e.g. Syria): Shapefiles/ESRI files of various small sizes for recent conflict zones in Iraq, Syria, and Yemen, but this data will be combined with satellite imagery (see below).
- Planet Labs for satellite imagery through Planet Labs API. One city image representing about 118 sq. km is approximately 80 - 110 MB; our training data set will include approximately 144 such images (2 per studied are damage assessment for pre and post analysis), which would adds up to about 14.4 GB of training data. We will also use additional satellite images to test our trained algorithm and asses its ability to classify damaged sites (see hypotheses and methodology).
- Stretch goal i): AWS SpaceNet has satellite imagery with documentation on roads, railways, etc. Integrating this data could be useful for helping identify damage in images.

Hypotheses:
1. To what extent can a machine learning algorithm (e.g. a neural network) classify damage given before and after satellite images to estimate:
   a. Extent of damage (partial vs complete)
   b. Objects damaged (buildings, bridges, roads, etc.)
   c. Size of crater
2. Can we train a machine learning algorithm (e.g. a neural network) to identify attributes about the attack?
   a. Targeted structure?
      i. What was the intended target?
   b. Effectiveness?
3. To what extent can a NN trained on images from a certain region be useful for analyzing images from other regions?

Methodology
1. Training Data
   a. Combine hand coded UNOSAT data with satellite imagery from Planet Labs from selected conflict zones
      i. UNOSAT provides information including location, size, and targets of attacks
      ii. Combine this information with before/after satellite imagery
   b. Train a neural network to identify bombing damage in images with respect to the UNOSAT data
2. Extension to larger dataset
   a. Test the NN to classify damaged objects in a hold-out set of images