CX4230 - Computer Simulation
Project 3C - Zika Virus Propagation - Checkpoint C
By: Derrick Williams and Tilak Patel
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Implementation Plan Status - Checkpoint C:

- Obtain updated airport dataset for major airports in the US
  - The OpenFlights.org original dataset will be used for the dataset. This will be trimmed down to just the airports within the seasonal boundary for the mosquitoes that can carry the Zika virus.
- Obtain top 25 hubs (cities) for analysis
  - The top 25 cities that were within the seasonal boundary for mosquitoes that can carry the Zika virus were obtained from Wikipedia ("List of the busiest airports in the United States").
- Obtain number of flights and passengers per route
  - Data was obtained from United States Department of Transportation - Bureau of Transportation Statistics and will have to combined to find statistics across all routes that are important to the airports within the seasonal boundary. Its also possible that we may make it consistent with the road network data and assume some parameter or random number generation on determining how many people go by plane and road.
- Obtain interstate dataset for the US
  - Based on what major airports are kept within the seasonal boundary of the mosquitoes, the road dataset will be created manually through the use Google Map distances on the interstates; basically creating a simple road dataset connecting the major hubs
- Obtain interstate travel data
  - From the research we did, no data could be found for how many people travel per interstate, so we will make this a parameter on how many people travel and see its effect on the propagation of the Zika virus
- Obtain population data for all major cities in the US
  - Estimated Census data for 2014 was obtained from the United States Census Bureau
- Obtain seasonal boundaries for where mosquitos that can carry the Zika virus can live throughout the year, population data

- A pdf map was obtained from the Centers for Disease Control website. Unless an electronic boundary is found, the airports outside the boundary will have to be eliminate manually.

- Figure out mosquito reproduction dynamics
  - The life cycle of one species of mosquitoes is 8-10 days with the potential for each female to lay 100 eggs on each cycle based on data from the Centers for Disease Control
- Figure out all parameters that we need for varying modeling simulations
  - Percentage of population that will travel by airplane and road.
  - Parameter changing where the infection starts out based on the ranking of the most popular airports
  - Vaccination rate of the hubs
  - Ability to shutdown hubs
  - Infection rate synthetic curve
- Confirm graphic software to demonstrate model (NetworkX)
  - Yes, we will be using NetworkX for this simulation