Week 5: Event

Purpose: gain a deeper understanding of the concept of events by experimenting with and producing event data in the key application of sensor networks.
Task 1: Visualize

Interface you are gonna use: http://geog.ucsb.edu/~regalia/wireless/index.html?event

The parameter you need to change:

- **start_at_percentage**: use it to change the days of the week.
- **Hint**: 0-1: scale the period of a week to the real number between 0 and 1
  e.g. 0.4128 (1/7) represent Sun 29 Jan 2012 08:09 (one day after the earliest date)
Task 2: Plot

Data: events_by_day.csv
Software: MATLAB

Commend:
bar(x, y)
Task 2: Plot-bar graph

Example: Most Popular Fruit

A survey of 145 people revealed their favorite fruit:

Fruit: Apple Orange Banana Kiwifruit Blueberry Grapes
People: 35 30 10 25 40 5

And here is the bar graph:

For that group of people Blueberries are most popular and Grapes are the least popular.

http://www.mathsisfun.com/data/bar-graphs.html
Task 3: Plot

Data: events_by_minutes.csv
Software: MATLAB

Scripts:
event_histogram_plotter.m
Task 3: Plot
Tips on Bar Graph and Histogram

Bar graph:
 X-axis is categories; you can change the order

Histogram:
 X-axis is ranges; you could not change the order
Task 3: Plot
Tips on Bar Graph and Histogram

http://www.shodor.org/interactivate/discussions/HistogramsVsBarGraph/
Task 3: Plot
Tips on offset and bins

Offset (between 0 and 1): shift the bar graph to left.
Bins: change the resolution of the graph.
## Task 4: Event data

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<tr>
<th>Time Stamp: Data &amp; Time</th>
<th>Wireless access point ID</th>
<th>User_id/Device_id</th>
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Task 5: Trajectory

Interface:

Parameters:
traveled_in_minutes: set the duration of the trajectory.
sample_size: the number of the trajectory
Task 6: Animation

Data: Time_Animation.lpk

Software: ArcMap
Tools: Time Slider Panel
Task 6: Animation

Important concepts to understand the animation in this scenario:

Event: When a device entering a service area, the wireless access point will catch the signal, then it is regarded as an event.

Static Map: the map only shows how many events are happening within the service area at this specific time.

Dynamic Map: shows the changing of events during a period of time.

Service areas: are generated based on the centroid (introduced on last lab) that within each service area, every points are closer to its centroids compared with other centroids.

Centroids: you could regard it as the place where the wireless access point is located.