```
In [1]: import pandas as pd
           import geopandas as gpd
           from shapely.geometry import Point
           import matplotlib.pyplot as plt
 In [2]: grid = gpd.read_file('grid_lmile.json').assign(
               idx = lambda x: 'hex-' + x.index.astype(str)
 In [3]: dat_points = pd.read_csv('priority1calls.csv').assign(
               geometry = lambda x: x.apply(
                    lambda row: Point(
                        row['Incident_Longitude'],
                        row['Incident Latitude']
                    ), axis=1
               )
In [12]:
          # Added by Steve
           dat_points.head()
Out[12]:
              Incident_Code Key_Month Incident_Date Incident_Priority Incident_Problem Incident_Zip_Code Incident_E
                                        2013-01-01
           0
                  11005617
                              201301
                                                                 Unconscious Pri 1
                                                                                         78748.0
                                                                                                  City of Aus
                                          00:00:00
                                        2013-01-01
                  11005641
                              201301
                                                                     Diabetic Pri 1
           1
                                                                                         78704.0
                                                                                                  City of Aus
                                                              1
                                          00:00:00
                                        2013-01-01
           2
                  11005807
                              201301
                                                                  Unconscious Pri 1
                                                                                         78753.0
                                                                                                  City of Aus
                                          00:00:00
                                        2013-01-01
           3
                  11005817
                              201301
                                                                  Unconscious Pri 1
                                                                                         78705.0
                                                                                                  City of Aus
                                          00:00:00
                                        2013-01-01
                              201301
                                                                   Respiratory Pri 1
                                                                                                       ESE
                  11006522
                                                                                         78660.0
                                          00:00:00
          5 rows × 36 columns
In [14]:
          dat points = gpd.GeoDataFrame(
               dat points
           dat points.crs = grid.crs
In [16]: dat_points_grid = gpd.sjoin(
               dat_points,
               grid,
               how='left',
               op='within'
          )
```

1 of 2 01-Aug-19, 2:28 PM

```
In [6]: breakdown_priority = dat_points_grid[[
             'idx',
             'Incident Priority'
         ]].pivot_table(
             index='idx',
             columns='Incident Priority',
             aggfunc=pd.Series.count
         ).apply(
             lambda x: round(
                 (x / sum(x)) * 100,
             ), axis=1
         ).fillna(0).rename(
             columns = lambda x: 'priority-' + str(x)
In [7]: breakdown_seconds = dat_points_grid.groupby('idx')['Incident_Priority'].agg([
                 pd.np.size
             ]
In [8]: | breakdown_goal = dat_points_grid.groupby('idx')[
             'Response Interval Goal Met (1=Y; " "=N)'
         ].agg([
             sum,
             pd.Series.count
         ]).rename(
             columns={
                 'sum': 'goal met',
                 'count': 'total count'
         ).assign(
             pct goal met = lambda x: round(
                 (x['goal_met'] / x['total_count']) * 100,
             )
In [9]: grid merge = grid.set index('idx').join(
             breakdown seconds.join(
                 breakdown_priority
             ).join(
                 breakdown goal
         ).fillna(0).query('size > 0').rename(
             columns = lambda x: str(x)
In [10]: grid merge.to file(
             'points-grid_1mile.geojson',
             driver='GeoJSON'
In [ ]:
```

2 of 2 01-Aug-19, 2:28 PM