Working with Leaflet: Philly 311 Data)

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This coding exercise was from the Program Evaluation and Data Analysis course taught by Dr. Nelson Lim at the University of Pennsylvania. Data was provided by the instructor.

Geocode Data

Load packages and data

```
# Packages
  library(leaflet)

# Read data
  load("clean311.rda")

# View column names
  names(mydata)
```

```
##  [1] "Service.Request.ID"        "Requested.Date.Time"
##  [3] "Service.Name"              "Service.Code"
##  [5] "Agency.Responsible"        "Status"
##  [7] "Service.Notice"            "Updated.Date.Time"
##  [9] "Expected.Date.Time"        "Address"
## [11] "Zipcode"                   "Media.URL"
## [13] "Location"                  "Latitude"
## [15] "Longitude"                 "Zipcodes"
## [17] "Census.Tracts.2010...2013"
```

Get quick facts on the data

```
summary(mydata)
```

```
##   Service.Request.ID           Requested.Date.Time
##   Min.   : 8853538    02/09/2015 08:54:46 AM:    7
##   1st Qu.: 9206278    02/09/2015 08:54:47 AM:    4
##   Median : 9468274    02/09/2015 08:54:49 AM:    3
##   Mean   : 9865518    02/26/2015 09:03:00 AM:    3
```

```
##  3rd Qu.:10684052   01/04/2016 02:04:58 PM:      2
##  Max.   :10961998   01/07/2015 08:08:43 AM:      2
##                     (Other)               :121029
##                                 Service.Name     Service.Code
##  Maintenance Residential or Commercial :19063   SR-LI21:19063
##  Rubbish/Recyclable Material Collection:15953   SR-ST03:15953
##  Illegal Dumping                       : 8639   SR-ST02: 8639
##  Street Defect                         : 8388   SR-ST01: 8388
##  Abandoned Vehicle                     : 7337   SR-PD01: 7337
##  Street Light Outage                   : 6030   SR-ST04: 6030
##  (Other)                               :55640   (Other):55640
##                          Agency.Responsible      Status
##  Streets Department               :57736    Closed:103707
##  License & Inspections            :38042    Open  : 17343
##  Community Life Improvement Program: 8624
##  Police Department                : 7489
##  Fire Department                  : 3941
##  Parks & Recreation               : 3786
##  (Other)                          : 1432
##          Service.Notice              Updated.Date.Time
##  20 Business Days:28462   04/08/2016 11:34:38 AM:    31
##  2 Business Days :15468   08/16/2016 04:16:23 PM:    31
##  5 Business Days :14383   04/21/2015 11:56:01 AM:    23
##  None            :13647   09/01/2015 06:52:17 AM:    19
##  3 Business Days :10882   08/12/2015 06:10:35 AM:    15
##  30 Business Days: 7737   09/01/2015 06:51:33 AM:    15
##  (Other)         :30471   (Other)               :120916
##           Expected.Date.Time              Address         Zipcode
##                     : 10107   5600 OGONTZ AVE     :    33   19143 : 6914
##  02/25/2015 07:00:00 PM:   432   1811 PINE ST        :    22   19140 : 6009
##  08/30/2015 08:00:00 PM:   404   5450 WISSAHICKON AVE:    21   19134 : 5961
##  08/31/2015 08:00:00 PM:   378   401 N 53RD ST       :    19   19124 : 5799
##  09/06/2015 08:00:00 PM:   362   1421 GRAYS FERRY AVE:    18   19132 : 5665
##  03/16/2015 08:00:00 PM:   355   2201 BRYN MAWR AVE  :    18   19139 : 4914
##  (Other)               :109012   (Other)             :120919   (Other):85788
##                                                                      Media.URL
##                                                                             :119784
##  https://d17aqltn7cihbm.cloudfront.net/uploads/large_2577bb4f5d10e21e2ee186086fc58aa8:     2
##  https://d17aqltn7cihbm.cloudfront.net/uploads/large_3ba7eaad24a495b928c809f7171e647f:     2
##  https://d17aqltn7cihbm.cloudfront.net/uploads/large_3d8c56715170088a81fd1840b8e2cfda:     2
##  https://d17aqltn7cihbm.cloudfront.net/uploads/large_6b2894ba24cec75b1c58b2afbf8f149f:     2
##  https://d17aqltn7cihbm.cloudfront.net/uploads/large_b2db4a7ce2fe98044fd2bbaae5809bfa:     2
##  (Other)                                                                             : 1256
##                         Location       Latitude        Longitude
##  POINT (-75.150858 40.039904):   33   Min.   :39.88   Min.   :-75.28
##  POINT (-75.139067 40.058019):   21   1st Qu.:39.96   1st Qu.:-75.19
##  POINT (-75.172013 39.946423):   21   Median :39.99   Median :-75.16
##  POINT (-75.180615 40.024743):   21   Mean   :39.99   Mean   :-75.15
##  POINT (-75.226395 39.966598):   19   3rd Qu.:40.03   3rd Qu.:-75.12
##  POINT (-74.984231 40.096936):   18   Max.   :40.14   Max.   :-74.96
##  (Other)                     :120917
##     Zipcodes    Census.Tracts.2010...2013
##  Min.   : 1.0   Min.   :  1.0
##  1st Qu.:19.0   1st Qu.: 88.0
```

```
##  Median :33.0   Median :187.0
##  Mean   :29.6    Mean    :186.3
##  3rd Qu.:41.0    3rd Qu.:277.0
##  Max.   :48.0    Max.    :384.0
##
```

Take random sample and create a complete address

```r
# Random sample
  set.seed(31) # other people can get the same random sample
  mysample <- mydata[sample(1:nrow(mydata), 100, replace = FALSE),]

# Combine multiple columns to create a complete address
  paste(mysample$Address, ",", mysample$Zipcode)
  mysample$addressclean <- paste(mysample$Address, "Philadelphia, PA,", mysample$Zipcode)
```

```
##   [1] "7007 UPLAND ST , 19142"              "2538 S 78TH ST , 19153"
##   [3] "3050 ROBBINS ST , 19135"             "1400 S DOVER ST , 19146"
##   [5] "728 W GODFREY AVE , 19120"           "1516 S DOVER ST , 19146"
##   [7] "2133 E TIOGA ST , 19134"             "4829 HAVERFORD AVE , 19139"
##   [9] "3900 CITY AVE , 19131"               "1415 E HEWSON ST , 19125"
##  [11] "5122 TULIP ST , 19124"               "1238 WAVERLY ST , 19147"
##  [13] "1914 MONUMENT ST , 19121"            "2250 FITZWATER ST , 19146"
##  [15] "5511 HAZEL AVE , 19143"              "5451 REGENT ST , 19143"
##  [17] "301 BYBERRY RD #G1 , 19116"          "8342 TORRESDALE AVE , 19136"
##  [19] "2133 N LAMBERT ST , 19121"           "N 60TH ST & MARKET ST , 19139"
##  [21] "1524 S BROAD ST , 19146"             "5210 DUFFIELD ST , 19124"
##  [23] "116 ROSEMAR ST , 19120"              "4519 PENNYPACK ST , 19136"
##  [25] "3126 FRIENDSHIP ST , 19149"          "839 MEDWAY RD , 19115"
##  [27] "4833 DUFFIELD ST , 19124"            "3226 FOX ST , 19129"
##  [29] "5017 DITMAN ST , 19124"              "2201 W THOMPSON ST , 19121"
##  [31] "1603 CHRISTIAN ST , 19146"           "6336 N WOODSTOCK ST , 19138"
##  [33] "220 N 58TH ST , 19139"               "2600 W TORONTO ST , 19132"
##  [35] "W ERIE AVE & N 09TH ST , 19135"      "4603 BLEIGH AVE , 19136"
##  [37] "E HAINES ST & ANDERSON ST , 19138"   "8727 DITMAN ST , 19136"
##  [39] "5400 WOODCREST AVE , 19131"          "4913 MARKET ST , 19131"
##  [41] "2885 ARAMINGO AVE , 19134"           "N 25TH ST & KELLY DR , 19130"
##  [43] "8430 BRUNSWICK PL , 19153"           "3731 N PARK AVE , 19140"
##  [45] "1715 S 6TH ST , 19148"               "2039 E SUSQUEHANNA AVE , 19125"
##  [47] "1741 W JUNIATA ST , 19140"           "3600 N 18TH ST , 19140"
##  [49] "1008 GREEN ST , 19123"               "1129 SANGER ST , 19124"
##  [51] "630 RECTOR ST , 19128"               "1320 W JEROME ST , 19140"
##  [53] "1443 N ALLISON ST , 19131"           "1148 E PASSYUNK AVE , 19147"
##  [55] "2470 N CHADWICK ST , 19132"          "53 N FELTON ST , 19139"
##  [57] "1932 MOORE ST , 19145"               "907 S 55TH ST , 19143"
##  [59] "5600 CATHARINE ST , 19143"           "3400 N LEE ST , 19134"
##  [61] "1702 FAIRMOUNT AVE , 19130"          "5140 SHELDON ST , 19120"
##  [63] "4304 MARPLE ST , 19136"              "10100 CALERA RD , 19114"
##  [65] "6308 MAGNOLIA ST , 19144"            "2751 N 45TH ST , 19131"
##  [67] "6056 KINGSESSING AVE , 19142"        "3467 KEIM ST , 19134"
##  [69] "928 RACE ST , 19107"                 "1422 S 10TH ST , 19147"
##  [71] "1430 CLYMER ST , 19146"              "2636 N HOLLYWOOD ST , 19132"
```

```
##  [73] "3001 BYBERRY RD , 19154"        "1349 W PIKE ST , 19140"
##  [75] "6327 MORTON ST , 19144"         "2141 S DAGGETT ST , 19142"
##  [77] "4961 W GIRARD AVE , 19131"      "619 N CREIGHTON ST , 19131"
##  [79] "5900 OGONTZ AVE , 19124"        "N 02ND ST & W BERKS ST , 19134"
##  [81] "7409 LAPWING PL , 19153"        "3306 RICHMOND ST , 19134"
##  [83] "2000 S 10TH ST , 19148"         "6700 LINDBERGH BLVD , 19142"
##  [85] "2514 S DEWEY ST , 19142"        "2024 MANTON ST , 19146"
##  [87] "2540 AMBER ST , 19125"          "6624 PASCHALL AVE , 19142"
##  [89] "358 E SHELDON ST , 19120"       "4006 N 13TH ST , 19140"
##  [91] "3960 ELSER ST , 19140"          "1335 SNYDER AVE , 19148"
##  [93] "1039 N LAWRENCE ST , 19123"     "1831 E CORNWALL ST , 19134"
##  [95] "2212 S WOODSTOCK ST , 19145"    "1586 N 52ND ST , 19131"
##  [97] "4885 MERION AVE , 19131"        "12 N 53RD ST , 19139"
##  [99] "542 E WALNUT LN , 19144"        "3437 N 02ND ST , 19131"
```

Geocode & save

```r
# mysample$coordinates <- geocode(mysample$addressclean, source = "dsk")
# save(mysample, file="mysamplegeocoded.rda")
```

Leaflet & interactive maps

```r
load("mysamplegeocoded.rda")

# assign colors depending on status
  pal <- colorFactor(c("navy", "red"), domain = c("Closed", "Open"))
  labs <- c("Closed", "Open")
  col <- c("navy", "red")

map <- leaflet() %>%
        # control the view
          setView(lng = -75.1652, lat = 39.9526, zoom = 11) %>%

        # commonly used map
          addTiles('http://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png') %>%

        # format map
          addCircleMarkers(~coordinates$lon, ~coordinates$lat, data = mysample,
                            color = ~pal(Status), # color
                            radius = 4, # size of circle
                            weight = 1, # higher numbers will make it larger, vice ver
                            fillOpacity = 0.6,
                            popup = paste("Location of Call:", mysample$address, "<br>",
                                    "Status:", mysample$Status, "<br>",
                                    "Agency Reponsible", mysample$Agency.Responsible)) %>% # modify pop

        # add legend
          addLegend("bottomright", colors= col, labels= labs, title="Call Status")

  # map
```
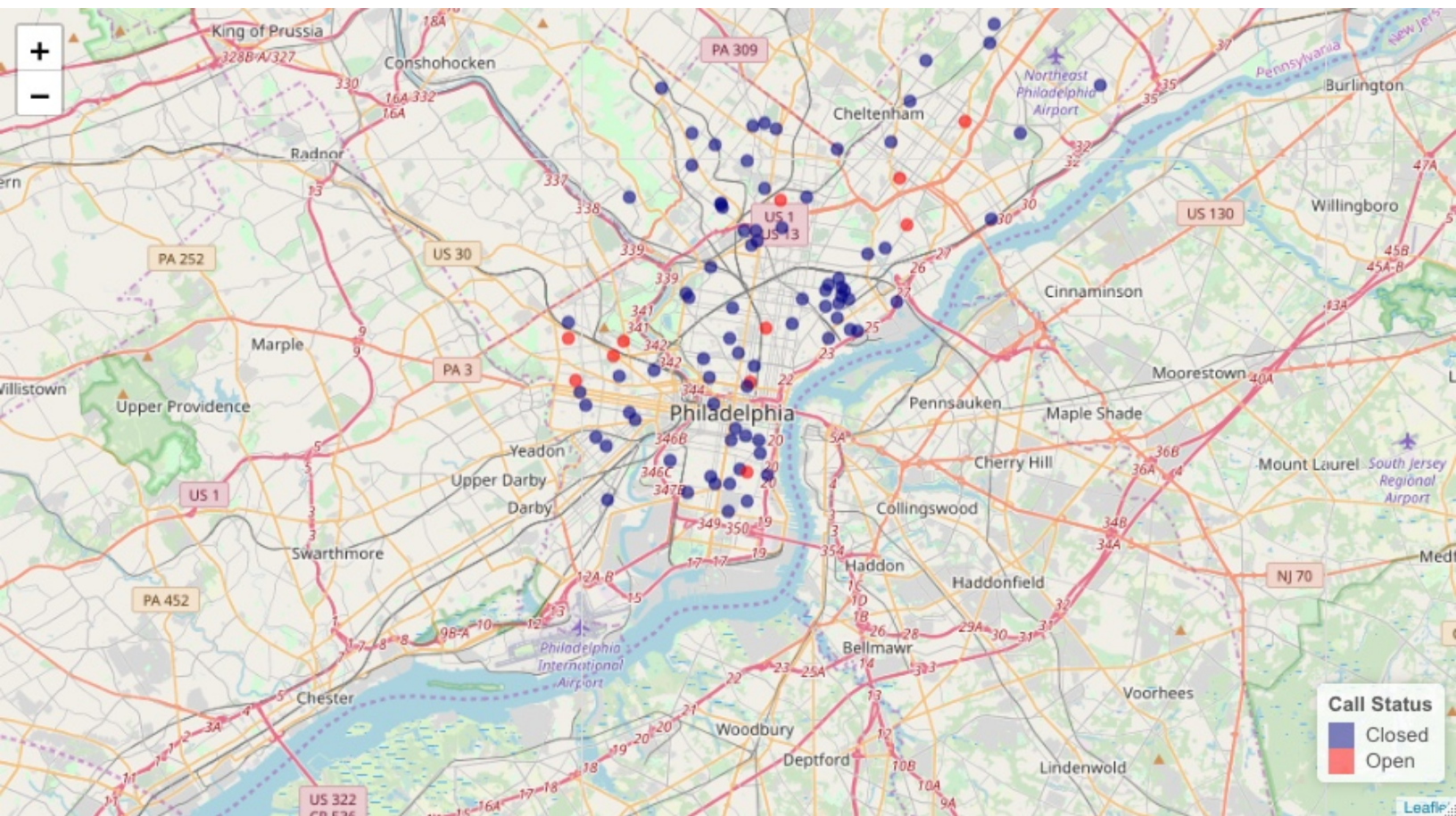
4

Export as interactive map in html

```
# library(htmlwidgets)
# saveWidget(map, file="311-leaflet-interactive.html", selfcontained = TRUE)
```