615_mapping

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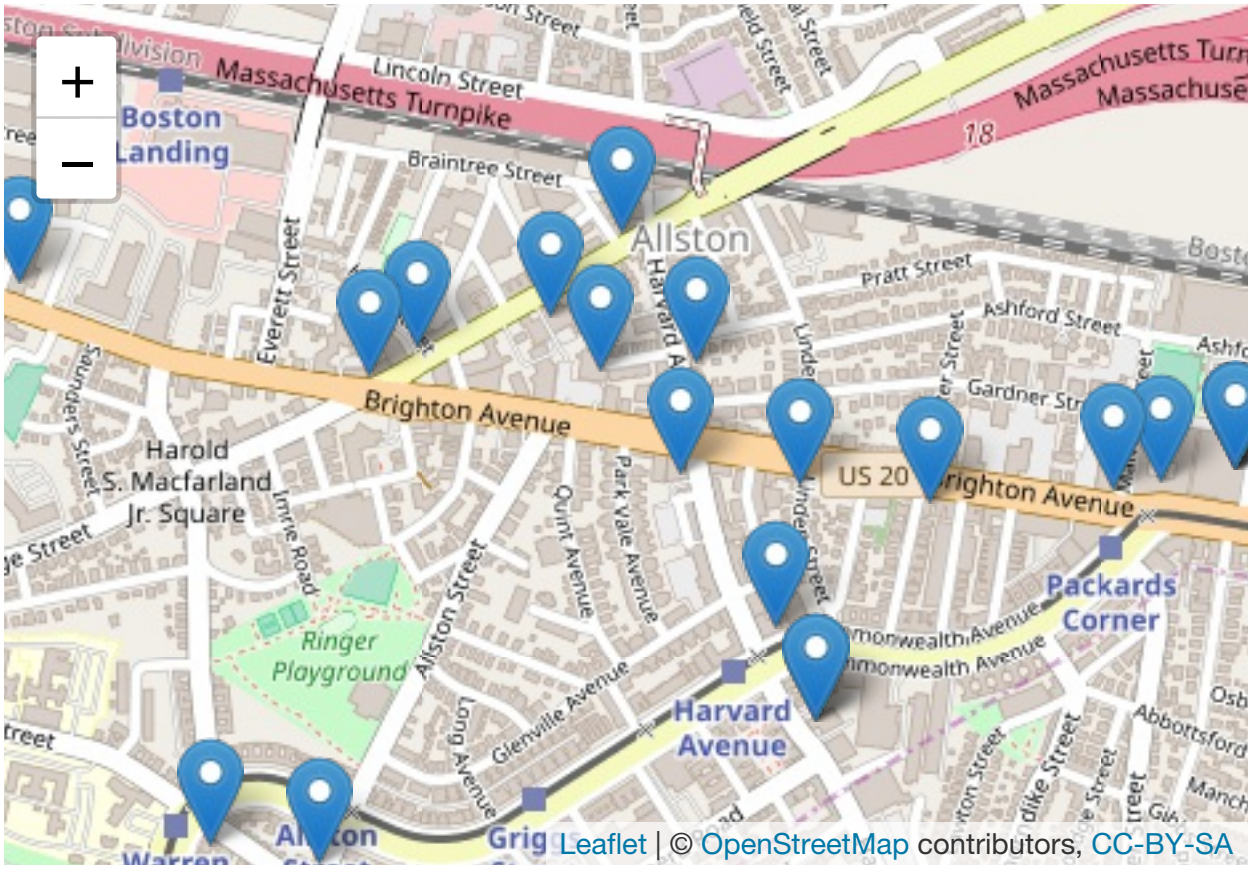
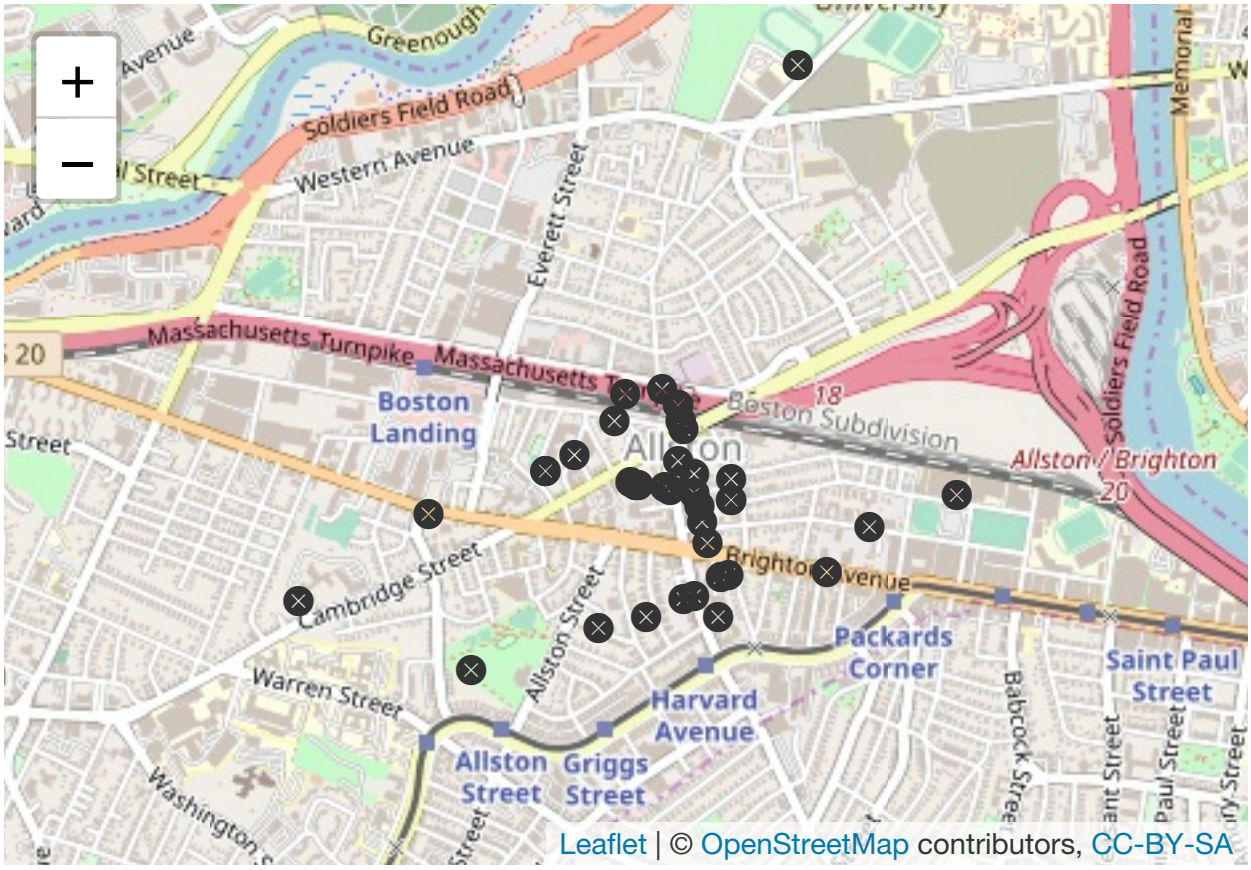
```
## -- Attaching packages ---------------------------------------------------------------------------
## ✓ ggplot2 3.1.0     ✓ purrr   0.2.5
## ✓ tibble  1.4.2     ✓ dplyr   0.7.7
## ✓ tidyr   0.8.1     ✓ stringr 1.3.1
## ✓ readr   1.1.1     ✓ forcats 0.3.0
## -- Conflicts ------------------------------------------------------------------------------------
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
##
## Attaching package: 'magrittr'
## The following object is masked from 'package:purrr':
##
##     set_names
## The following object is masked from 'package:tidyr':
##
##     extract
## rgdal: version: 1.3-6, (SVN revision 773)
##  Geospatial Data Abstraction Library extensions to R successfully loaded
##  Loaded GDAL runtime: GDAL 2.1.3, released 2017/20/01
##  Path to GDAL shared files: /Library/Frameworks/R.framework/Versions/3.5/Resources/library/rgdal/gdal
##  GDAL binary built with GEOS: FALSE
##  Loaded PROJ.4 runtime: Rel. 4.9.3, 15 August 2016, [PJ_VERSION: 493]
##  Path to PROJ.4 shared files: /Library/Frameworks/R.framework/Versions/3.5/Resources/library/rgdal/pr
##  Linking to sp version: 1.3-1
##
## Attaching package: 'lubridate'
## The following object is masked from 'package:base':
##
##     date
## Parsed with column specification:
## cols(
##   .default = col_character(),
##   LICENSENO = col_integer(),
##   ISSDTTM = col_datetime(format = ""),
##   EXPDTTM = col_datetime(format = ""),
##   RESULTDTTM = col_datetime(format = ""),
##   VIOLDTTM = col_datetime(format = ""),
##   StatusDate = col_datetime(format = ""),
##   Property_ID = col_integer()
## )
## See spec(...) for full column specifications.
```

Question 1:How many retail shops in Allston have legal licence until now?



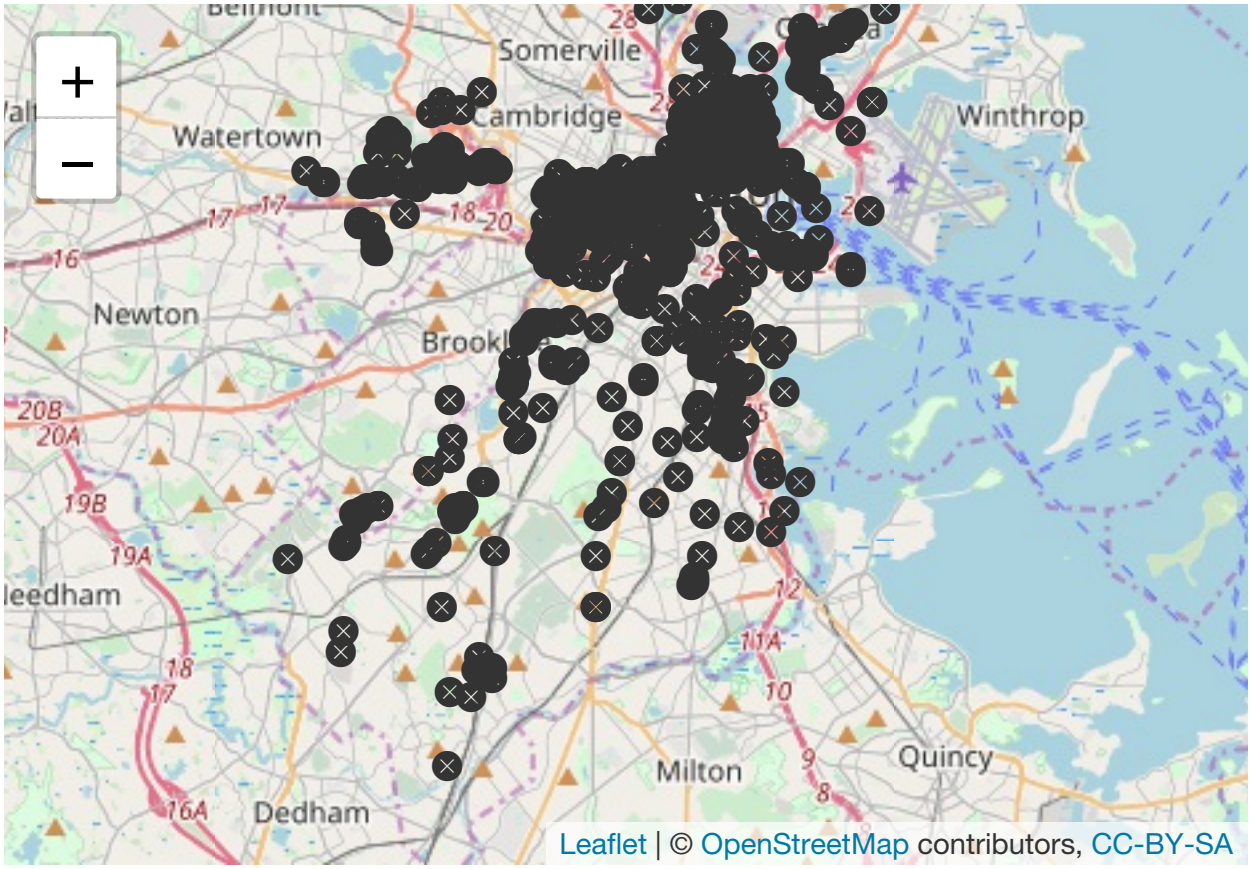
There are 36 retail shops in Allston in total, 29 of which has active license until now, however, only 21 shops have complete location data, they are showed in this map.

Question 2:How many restaurants nearby Boston University where are three main areas-Fenway, Back Bay and Allston-occurred violation events during the last three months (08/01/2018-10/31/2018)? How many violations took place by these restaurants?



There are 65 restaurant nearby BU occurred violation in the last three month, they are concentrated around Allston. Ectracting the restaurants which have not complete location information in our dataset, here are 45 restaurants shows in the map. The orange points represent the the times of violation less than 2, the red one represents the violation more than 2 times in the last three months. Hope this map can give BU students and staffs some suggestions for choosing a better restaurant.

Let focus on an bigger picture, we analysed all of the restaurant around the Boston which has the active licence until now. We considered the two factors: the number of violation by each restaurant ID and their violation level from 01/01/2017 to 01/01/2018 and counted their valid violation (violation status is pass) and calculated their average violation level to valuate these restaurants. We divided these restaurant into 3 groups by the type of entities: eating & drinking restaurant, eating & drinking /take out food and retail shops/walk-on restaurant in order to aviod a mussy map.


Somerville
Cambridge
Watertown
Winthrop
Newton
Milton
Quincy
Dedham
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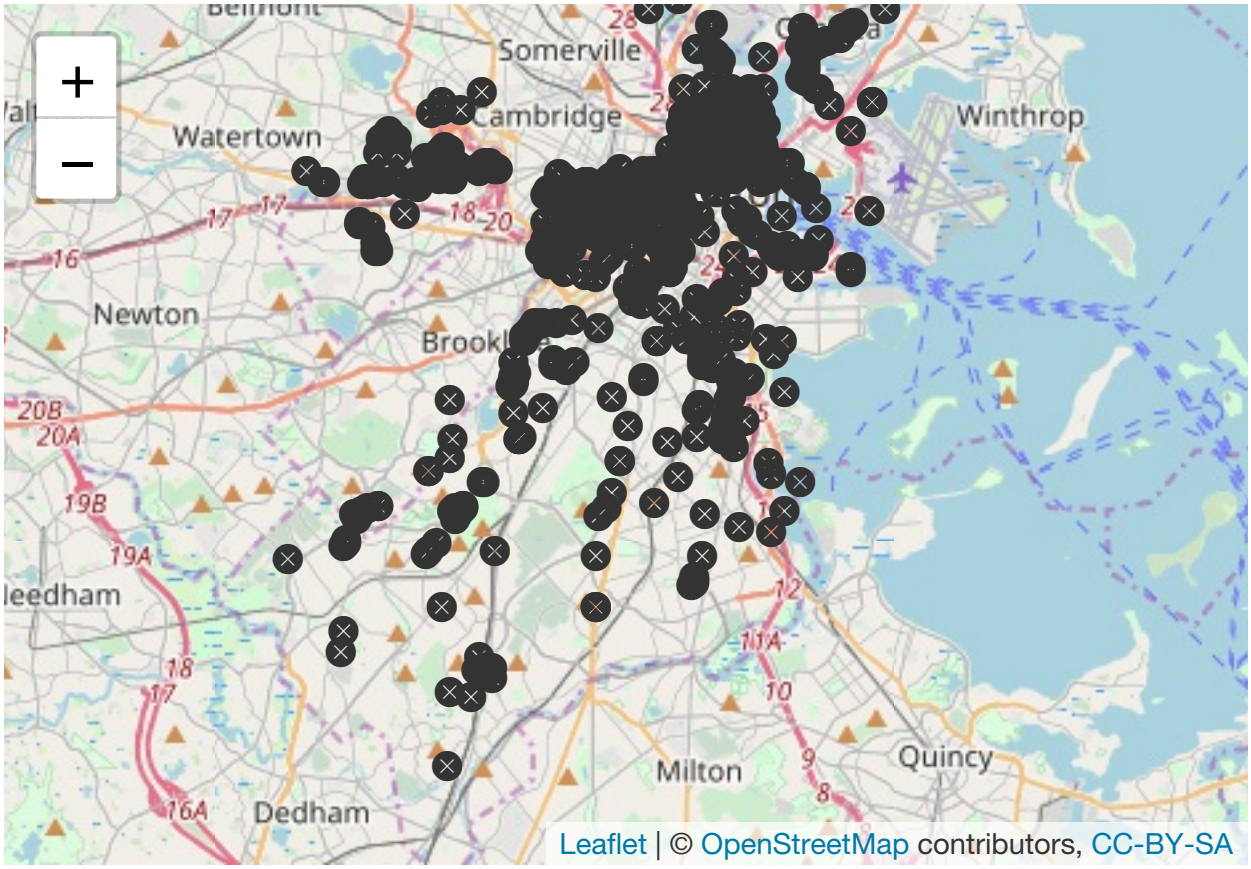
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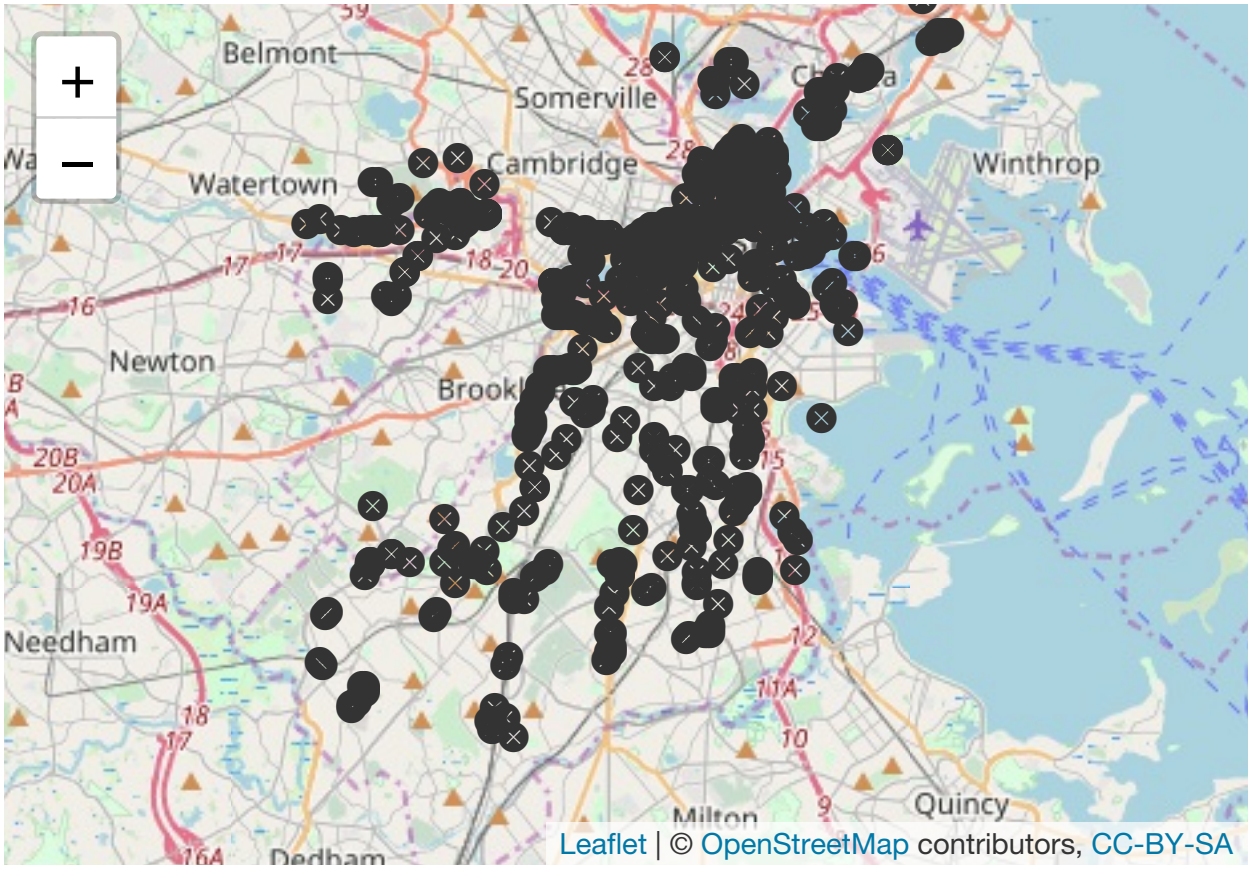
Belmont
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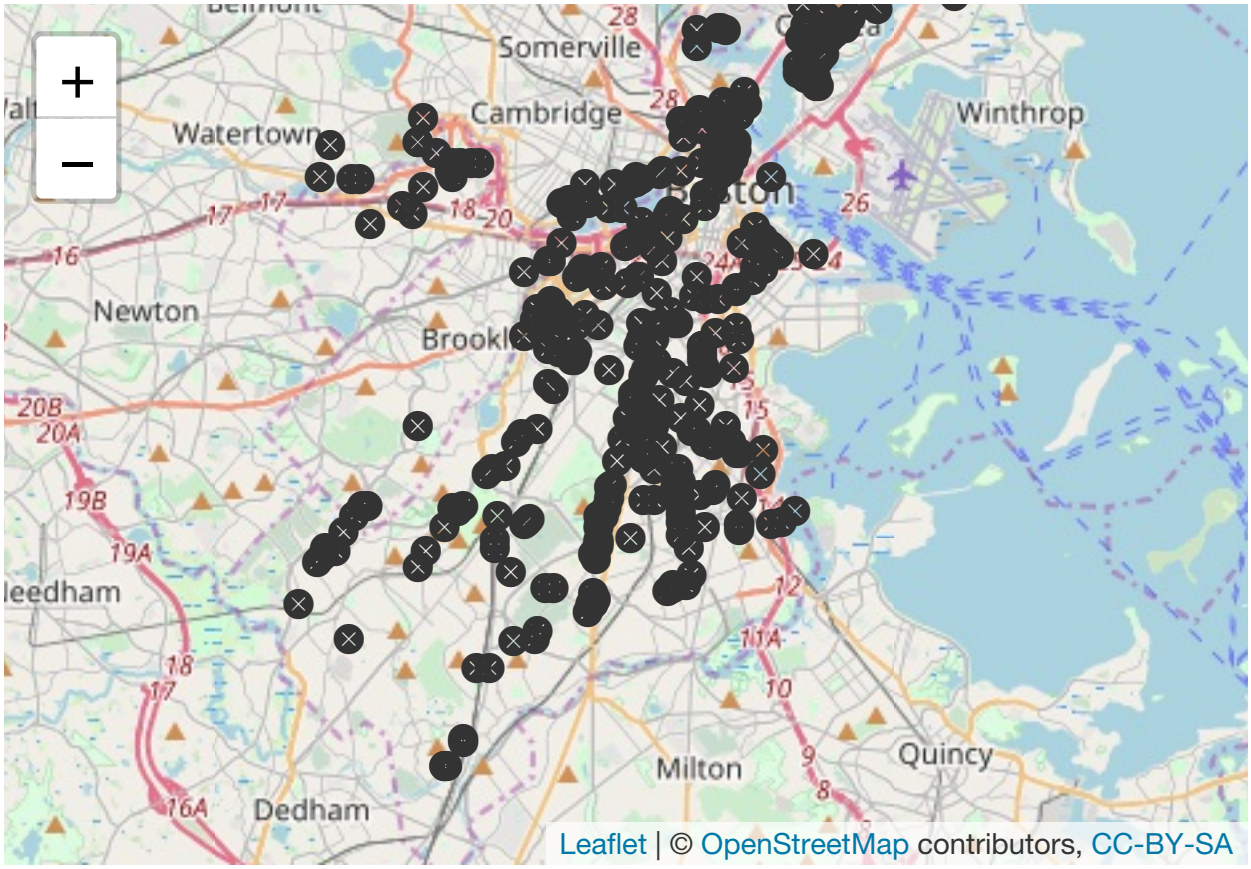
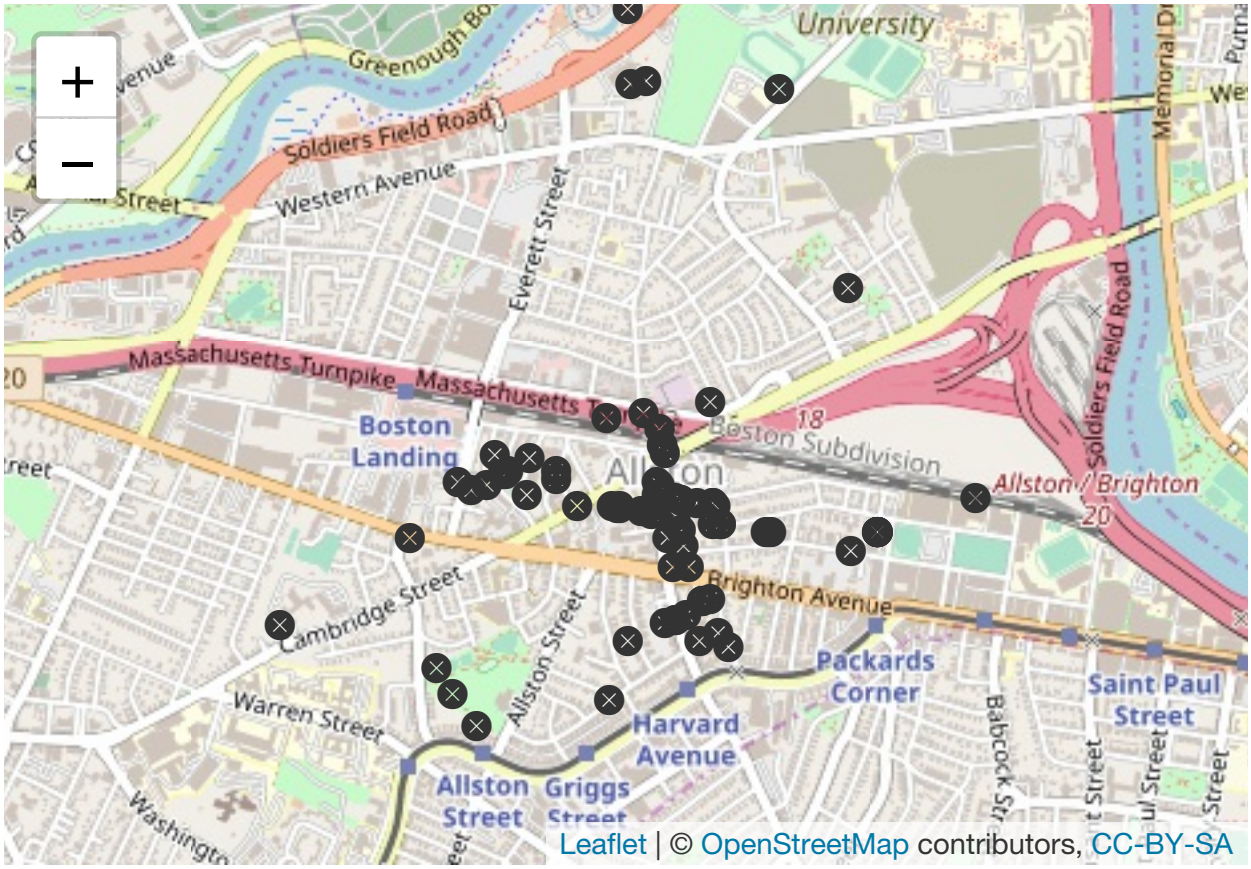


The three maps show the different type of restaurant-eating & drinking restaurant, eating & drinking /take out food and retail shops/walk-on restaurant, respectively. The different colors mean the levels of danger, we assumed the bigger number of violation indicate the higher risk of hygien. The green one means this restaurant never violate the health rule in the past year-health, the orange one means the number of violation is lower than median-relative health, and the red one means the number of violation is more than median-danger.

Then we continue to analyse the three areas-Fenway, Allston and Back bay-near the BU.


University
Greenough Bo
Soldiers Field Road
Western Avenue
Everett Street
Massachusetts Turnpike
Boston Landing
Boston Subdivision
Allston / Brighton
Soldiers Field Road
Memorial D
Brighton Avenue
Cambridge Street
Allston Street
Packards Corner
Saint Paul Street
Warren Street
Harvard Avenue
Allston Street
Griggs Street
Babcock St
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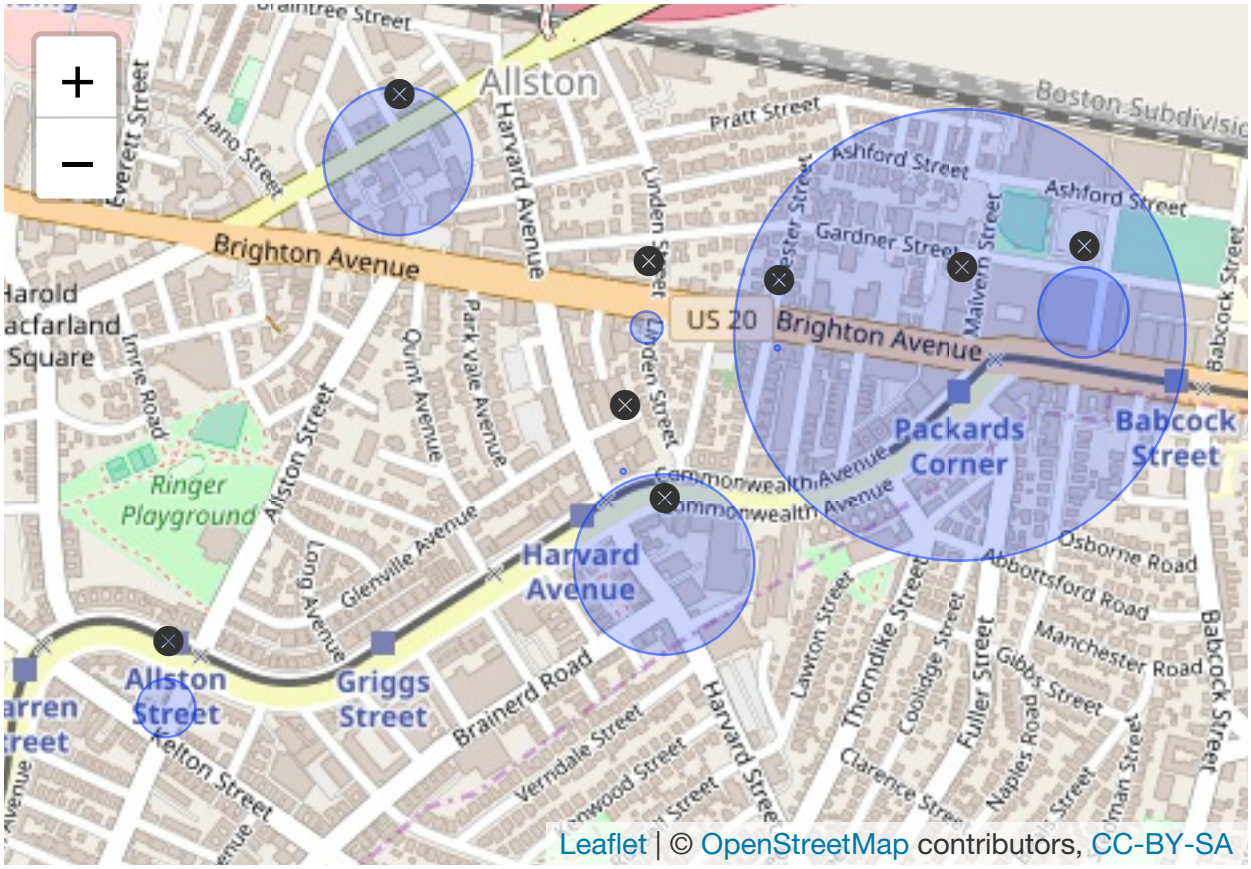
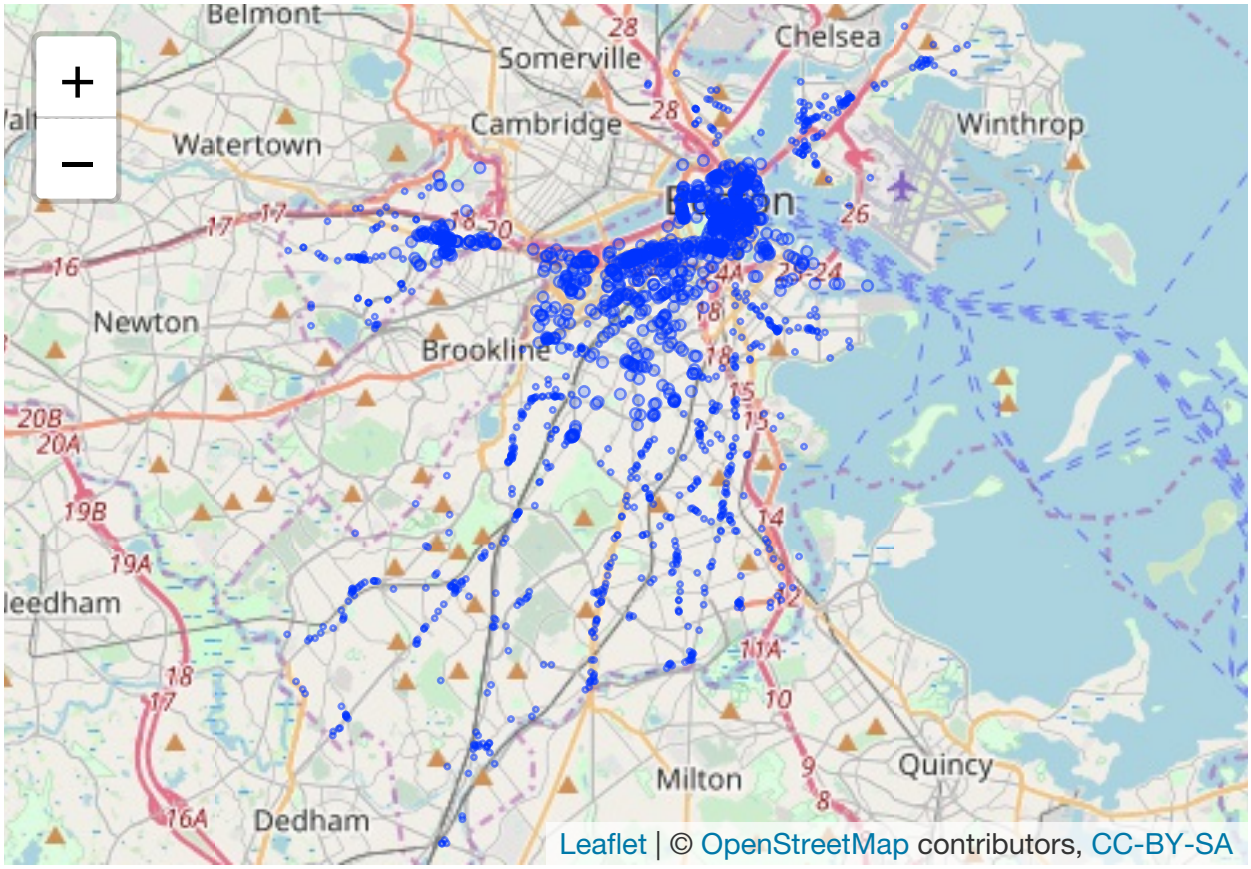


Just like mentioned before, these three maps shows the variation of risk level of the restaurant nearby BU in different type. Click the location sign, it will give you the basic information about this restaurant: the average violation level in the last year, district, restaurant name and its ZIP code. The radius of circle shows the count of violation, a bigger radius means a bigger count.



This map shows the distribution of restaurant around the Boston.

In the next step we would like to rank and grade these restaurant according to their past violation record and other information. And we are also designing and creating the shinyapp for interactive goal.