

Assignment 1 Draft Jin Gao

```
library(sf)

## Linking to GEOS 3.9.0, GDAL 3.2.1, PROJ 7.2.1

library(tidyverse)

## -- Attaching packages ----- tidyverse 1.3.1 --

## v ggplot2 3.3.5      v purrr 0.3.4
## v tibble 3.1.4       v dplyr 1.0.7
## v tidyr 1.1.3        v stringr 1.4.0
## v readr 2.0.1        v forcats 0.5.1

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()

library(ggthemes)
library(ggspatial)
library(raster)

## Loading required package: sp

##
## Attaching package: 'raster'

## The following object is masked from 'package:dplyr':
##
##      select

## The following object is masked from 'package:tidyr':
##
##      extract
```

Attempt 01

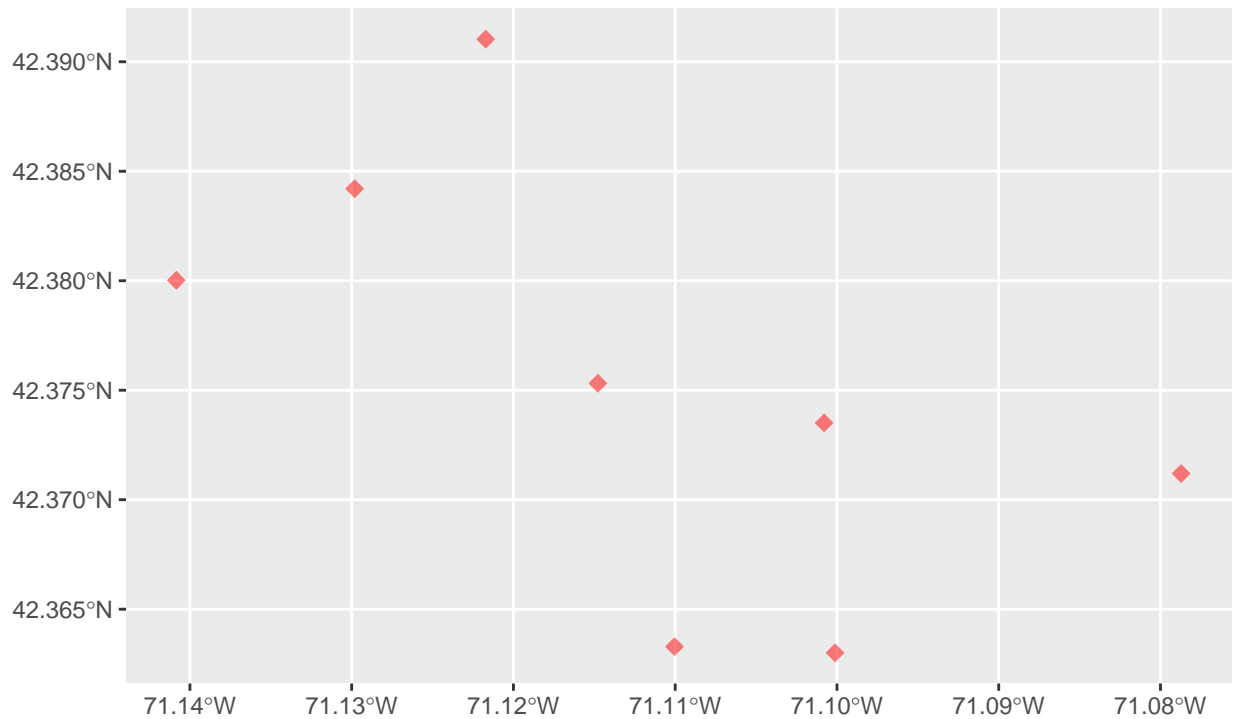
Step 1: Read the data.

```
FireStations <- st_read("https://raw.githubusercontent.com/cambridgegis/cambridgegis_data/main/Public_S
OpenSpace <- st_read ("https://raw.githubusercontent.com/cambridgegis/cambridgegis_data/main/Recreation,
```

```

element_FireStations <- ggplot(FireStations) +
  geom_sf(data = FireStations, shape = 18,color = "red", size = 3, alpha = 0.5)
element_FireStations

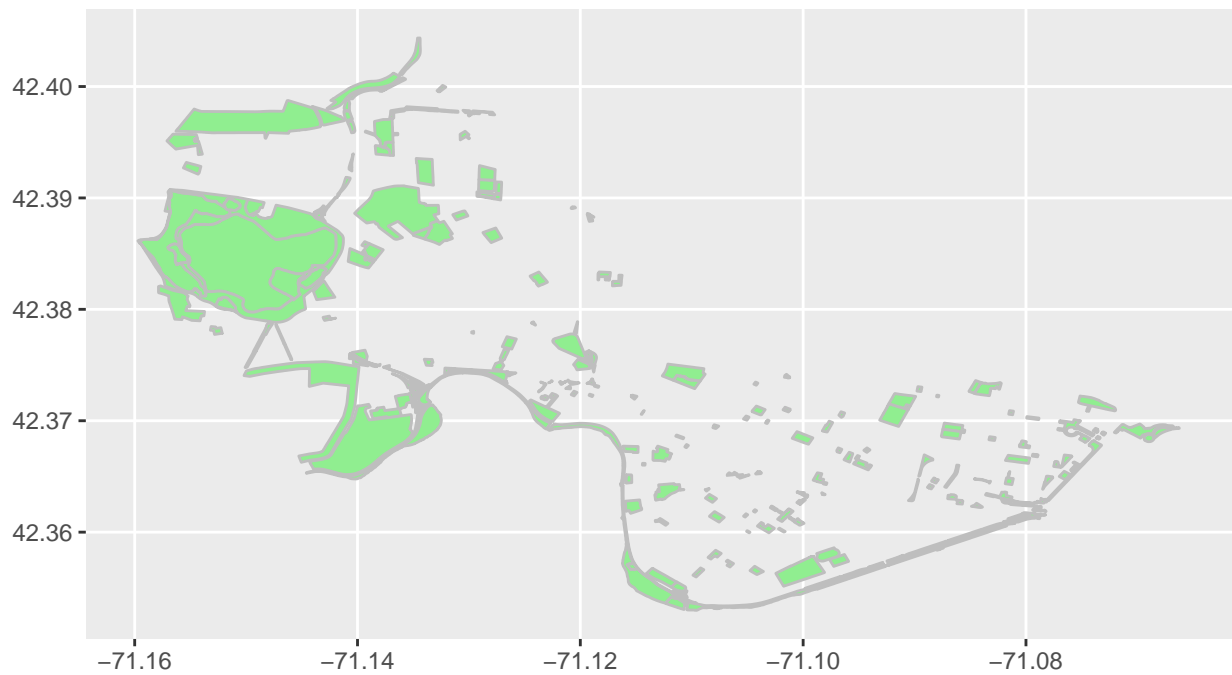
```



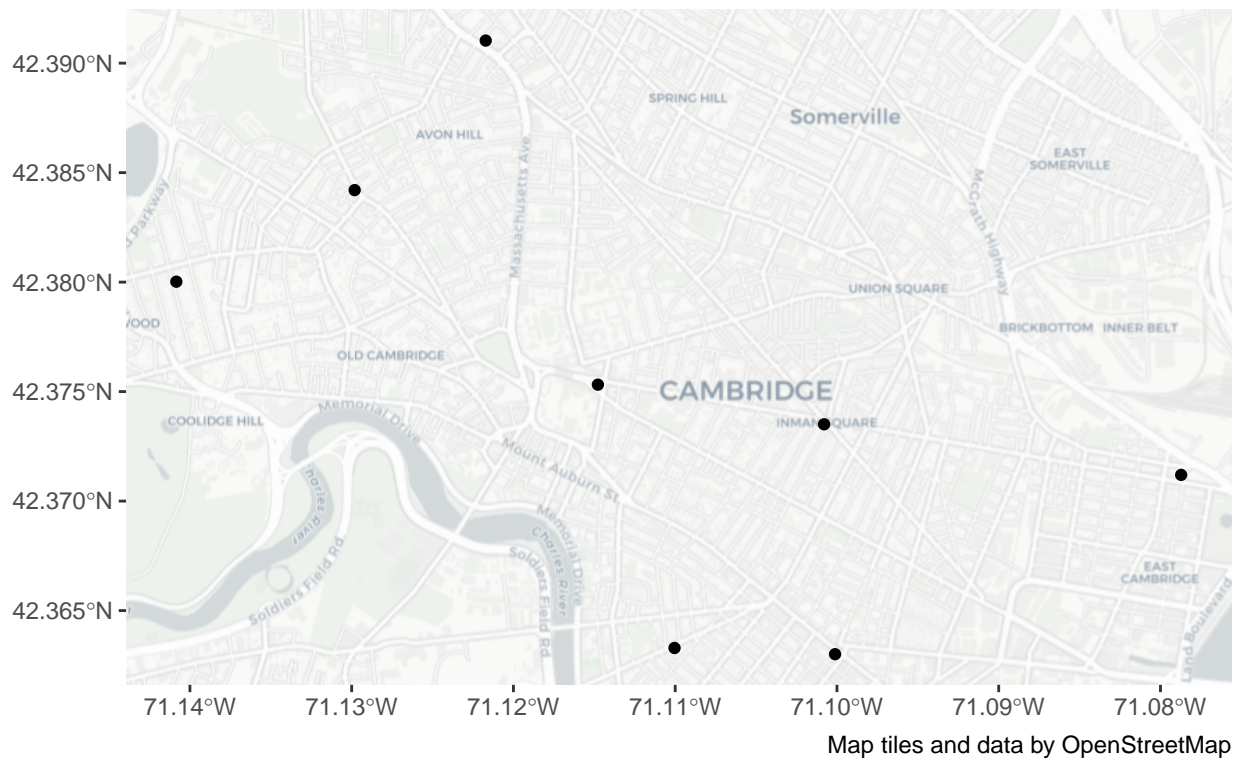
```

element_OpenSpace <- ggplot(OpenSpace) +
  geom_sf(data = OpenSpace, fill = "lightgreen", color = "gray")
element_OpenSpace

```



```
element_OpenSpace <- ggplot(FireStations) +
  geom_sf(data = FireStations, size = 0) +
  annotation_map_tile(zoomin = 0, progress = "none", type = "cartolight") +
  geom_sf() +
  labs(caption = "Map tiles and data by OpenStreetMap")
element_OpenSpace
```



```
#pdf("map_1.pdf", width = 5, height = 3) element_FireStations + element_OpenSpace +
element_OSM + element_Legend dev.off() #
```

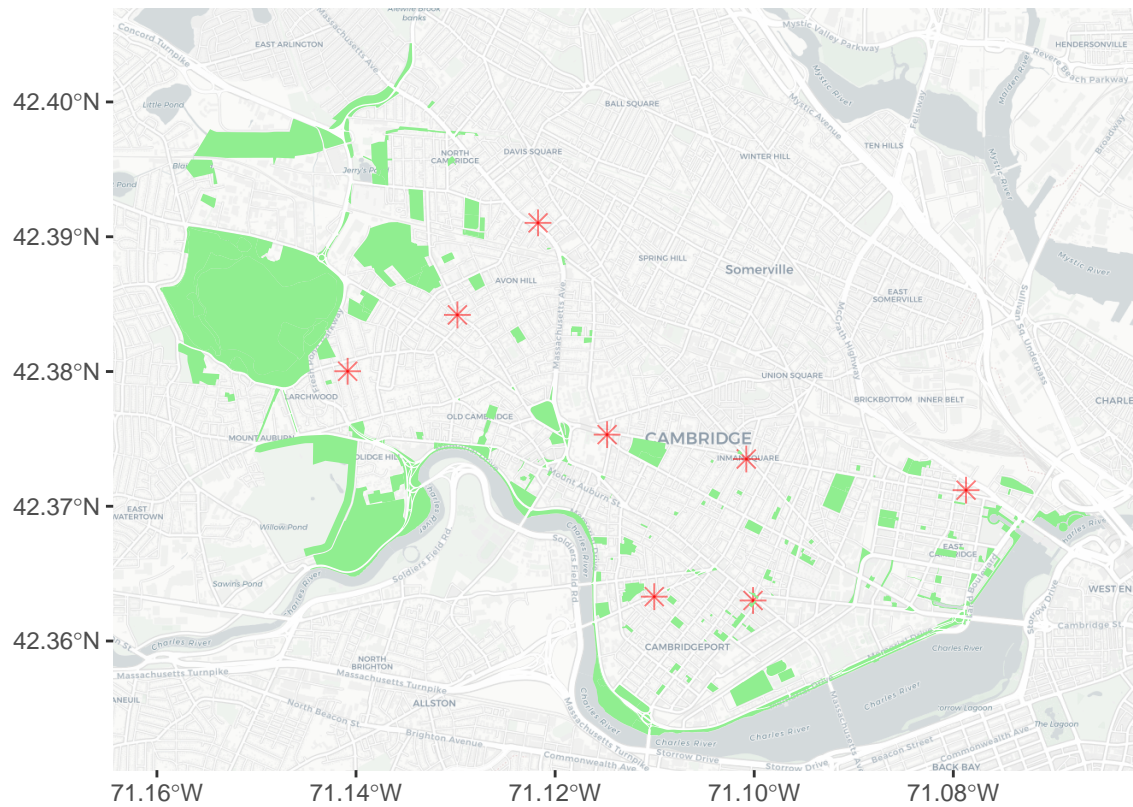
Attempt 02

Step 1: Read the data.

```
FireStations <- st_read("https://raw.githubusercontent.com/cambridgegis/cambridgegis_data/main/Public_Spaces/FireStations.shp")
OpenSpace <- st_read("https://raw.githubusercontent.com/cambridgegis/cambridgegis_data/main/Recreation/Open_Space.shp")
```

Step 2: Draw in one graph.

```
ggplot() +
  annotation_map_tile(zoomin = 0, progress = "none", type = "cartolight") +
  #scale_fill_manual(values = "lightgreen", name = "") +
  #scale_color_manual(values = c("red"), name = "") +
  geom_sf(data = FireStations, shape = 8, color = "red", size = 3, alpha = 0.5) +
  geom_sf(data = OpenSpace, fill = "lightgreen", color = NA) +
  labs(caption = "Map tiles and data by OpenStreetMap")
```



Map tiles and data by OpenStreetMap

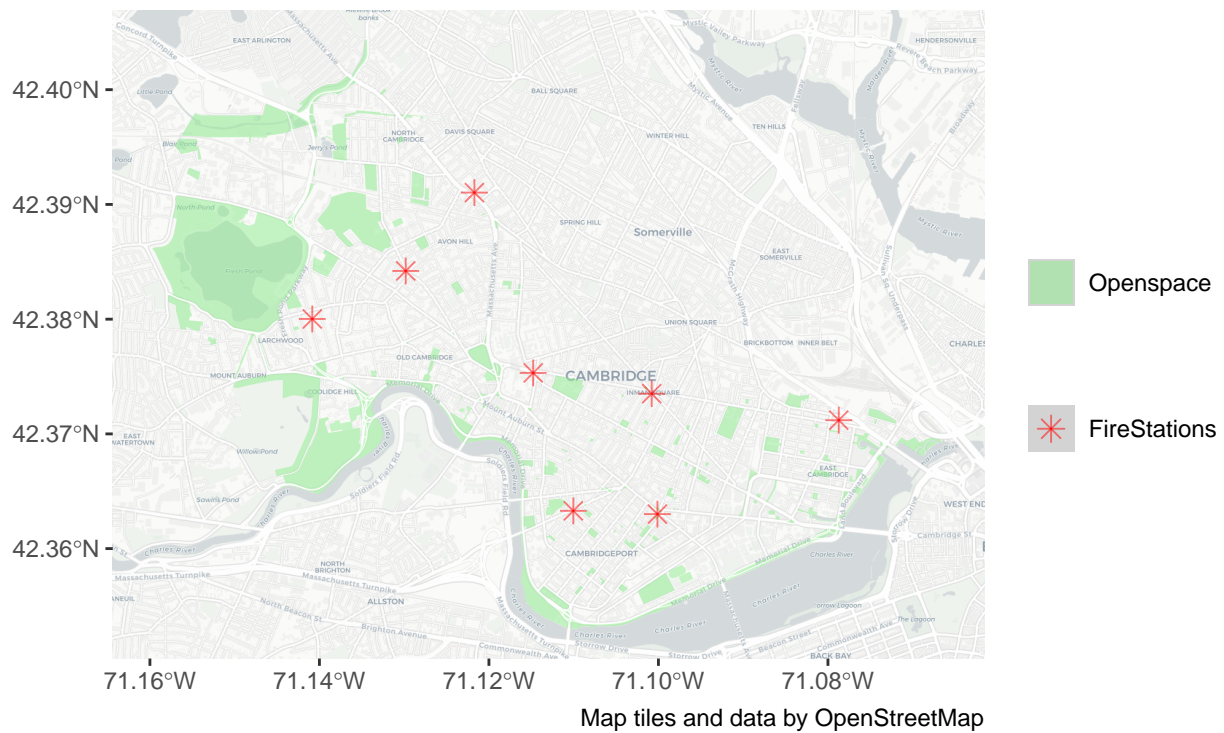
Adding legend

```
Lightmap <- ggplot() +
  annotation_map_tile(zoomin = 0, progress = "none", type = "cartolight") + #Adding OSM

  geom_sf(data = OpenSpace, aes(fill = "Openspace"), color = NA, alpha = 0.5) + #Drawing Openspaces
  geom_sf(data = FireStations, shape = 8, aes(color = "FireStations"), size = 3, alpha = 0.5) + #Drawing FireStations

  scale_fill_manual(values = "lightgreen", name = "") + #Drawing Legends
  scale_color_manual(values = c("red"), name = "") +
  labs(caption = "Map tiles and data by OpenStreetMap") + #Caption
  theme(panel.background = element_rect(fill = "black"), legend.key = element_rect(fill = "lightgrey"))

Lightmap #Plot
```



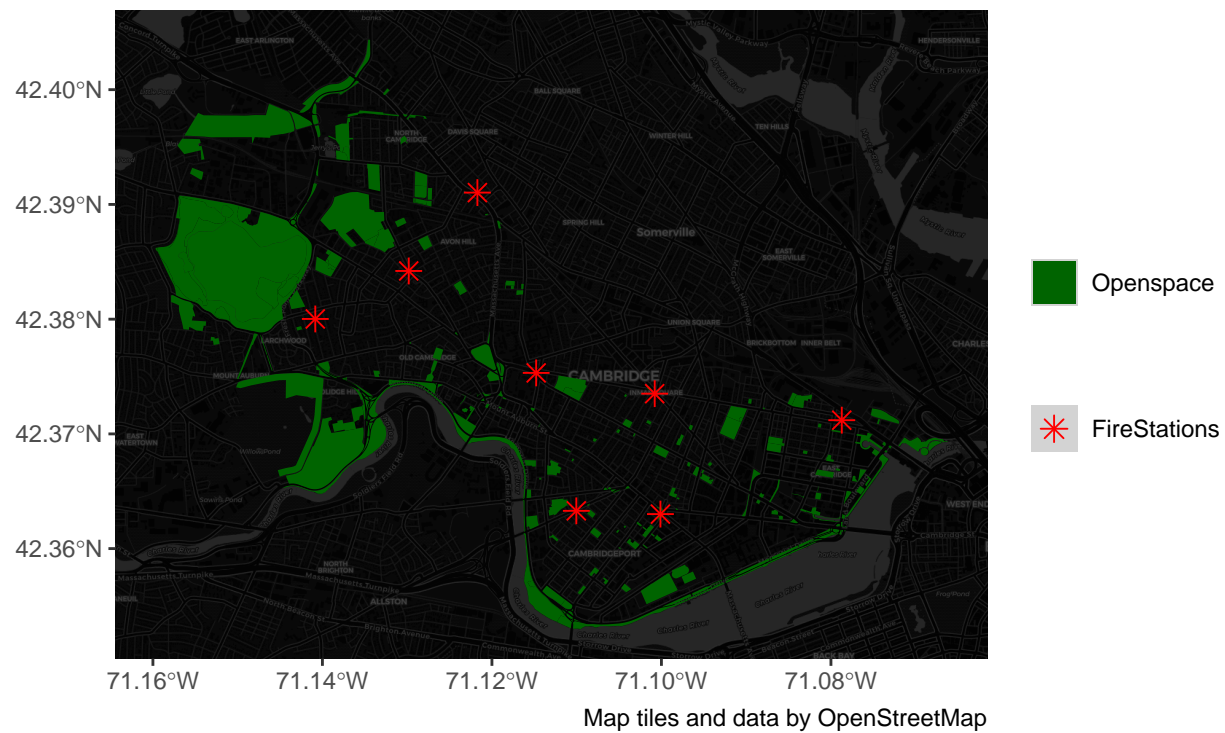
Dark Mode

```
Darkmap <- ggplot() +
  annotation_map_tile(zoomin = 0, progress = "none", type = "cartodark") + #Adding OSM

  geom_sf(data = OpenSpace, aes(fill = "Openspace"), color = NA, alpha = 1) + #Drawing Openspaces
  geom_sf(data = FireStations, shape = 8, aes(color = "FireStations"), size = 3, alpha = 1) + #Drawing

  scale_fill_manual(values = "darkgreen", name = "") + #Drawing Legends
  scale_color_manual(values = c("red"), name = "") +
  labs(caption = "Map tiles and data by OpenStreetMap") + #Caption
  theme(panel.background = element_rect(fill = "black"), legend.key = element_rect(fill = "lightgrey"))
```

Darkmap



Output PDF

```
pdf("Draft Outputs.pdf",width = 5, height = 5)
Lightmap
Darkmap
dev.off()
```

```
## pdf
## 2
```