Yelp Dataset Review

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DOES LOCATION ATTRACT HIGHER RATING

```
#read the data and load the libraries
library(readr)

## Warning: package 'readr' was built under R version 3.3.3

library(dplyr)

## Warning: package 'dplyr' was built under R version 3.3.3

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

library(stringr)

## Warning: package 'stringr' was built under R version 3.3.3

library(jsonlite)

## Warning: package 'jsonlite' was built under R version 3.3.3

business_file_path =
"C:/Users/achou/Downloads/R/project/yelp_academic_dataset_business.json"

business_lines <- read_lines(business_file_path, progress = FALSE)

business_combined <- str_c("[", str_c(business_lines, collapse = ", "), "]")

business <- fromJSON(business_combined) %>%
  flatten() %>%
  tbl_df()
```

For the decision of a business at a location, lets keep the area to the Las Vegas city.

```
#filter out NV from the data
business_NV <- subset(business, business$state == 'NV')
city_NV = data.frame(unique(business_NV$city))#find all unique cities in NV
to see different variations of Las Vegas

#convert all occurences of varying Las Vegas to a standard
business_NV <- lapply(business_NV, function(x) {gsub("South Las Vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("North Las Vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("Las Vegas East", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("N. Las Vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("West Las Vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("N W Las Vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("N E Las Vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("las vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("Las  Vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("Las Vegas NV", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("Las vegas", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("Las Vegass", "Las
Vegas", x)})
business_NV <- lapply(business_NV, function(x) {gsub("LasVegas", "Las Vegas",
x)})
business_NV <- lapply(business_NV, function(x) {gsub("LasVegas", "Las Vegas",
x)})
business_NV <- lapply(business_NV, function(x) {gsub("LasVegas", "Las Vegas",
x)})

business_LV <- subset(business, business$city == 'Las Vegas')
```

A general notion is, for better ratings, it is preferred to open a business a a popular location. So we find the most popular location in the most popular neghborhood.

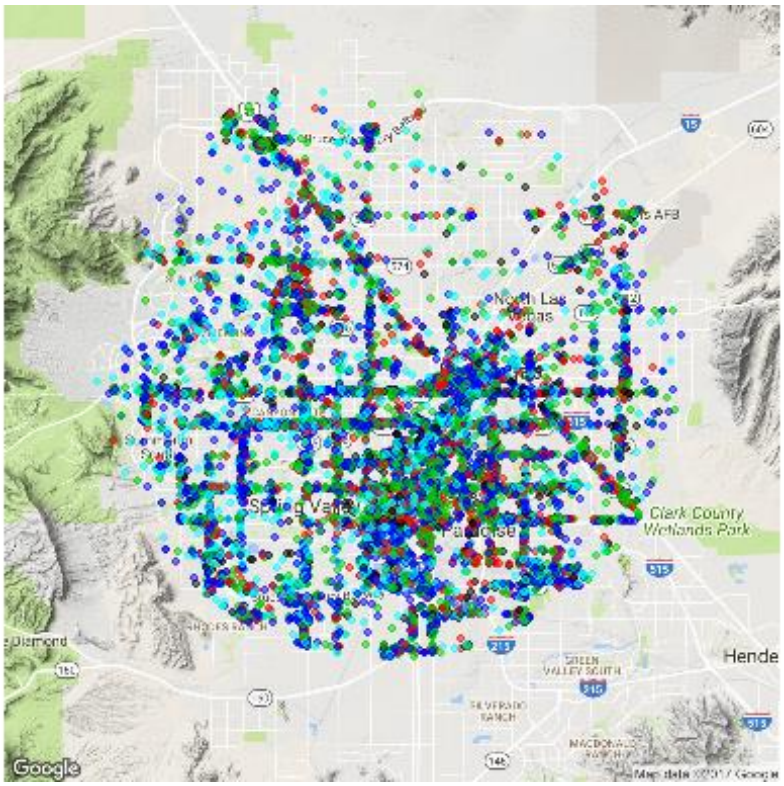
```
# count the frequency for each neighborhood to find the most popular
neighbourhood
temp <- as.vector(business_LV[['neighborhood']])
n_freq = as.data.frame(table(unlist(temp)))

#count the frequncy of coordinate to find a single popular coordinate. This
coordinate will be used as the center and find distance from this point
```

```
library(dplyr)
coord_westside <- subset(business_LV, business$neighborhood == 'Westside')
coord_westside <- dplyr::select(coord_westside, business_id,longitude,
latitude)
coord_westside <- coord_westside%>%tidyr::unite(coordinates, longitude,
latitude, sep = ",")
temp_coord <- as.vector(coord_westside[['coordinates']])
coord_freq = as.data.frame(table(unlist(temp_coord))) #-
115.2659777,36.1988542(long,lati): 4 entries at this coordinate
```

Now, we calculate the distance of every business from this point.

```
#finding distance
library(geosphere)

## Warning: package 'geosphere' was built under R version 3.3.3

## Loading required package: sp

## Warning: package 'sp' was built under R version 3.3.3

lv_dist_matrix <- dplyr::select(business_LV, business_id,name, neighborhood,
stars, review_count, longitude, latitude, categories)

distance <- function(longitude, latitude)
{
  distance= distm (c(-115.1963, 36.17226), c(longitude, latitude), fun =
distHaversine)
  return(distance)
}

lv_dist_matrix['distance']=0
for(i in 1:nrow(lv_dist_matrix)){
  lv_dist_matrix$distance[i] =
distance(lv_dist_matrix$longitude[i],lv_dist_matrix$latitude[i])
}

lv_dist_r10 <- subset(lv_dist_matrix, lv_dist_matrix$distance < 15000)

library(ggmap)

## Warning: package 'ggmap' was built under R version 3.3.3

## Loading required package: ggplot2

## Warning: package 'ggplot2' was built under R version 3.3.3

#map_center <- get_map(location = c(lon = -115.2659777, lat = 36.1988542),
zoom = 13, scale = "auto")
map_plot <- qmap(location = c(lon = -115.1949777, lat = 36.1588542), zoom =
11, scale = "auto", legend = "right")
```

```
## Map from URL :
http://maps.googleapis.com/maps/api/staticmap?center=36.158854,-
115.194978&zoom=11&size=640x640&scale=2&maptype=terrain&language=en-
EN&sensor=false

## Warning: `panel.margin` is deprecated. Please use `panel.spacing` property
## instead

map_plot+
  geom_point(aes(x = lv_dist_r10$longitude, y = lv_dist_r10$latitude,
size=lv_dist_r10$stars), data = lv_dist_r10, , color= lv_dist_r10$stars,
alpha = .5, size = 2, pch = 20)+
  scale_color_manual(lv_dist_r10$stars)
```



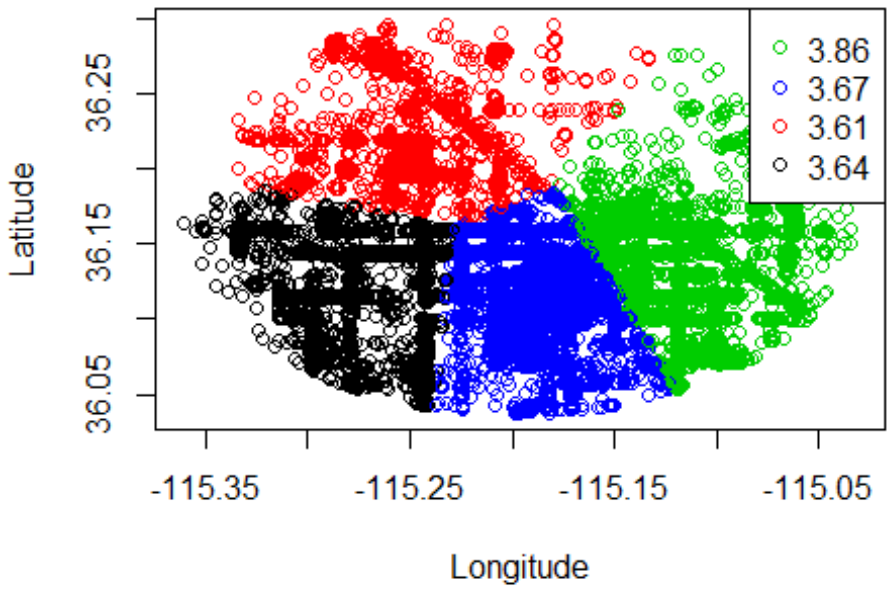
Once we have all the distances and the star rating of all the businesses, we try to corelate them. Following are the results.

```
#is there any corelation between a central location and the ratings
cor(lv_dist_r10$distance, lv_dist_r10$stars)

## [1] 0.007405653

#NOT CORELATED

cor(lv_dist_r10$stars, lv_dist_r10$review_count)

## [1] 0.01409579
```

```
#NOT CORELATED
```

Once we figure out that location is irrelevant to the star rating of a business, we may try to find the competition among various parts of the city. So we divide the city in clusters and take a look at the average rating of each cluster. The cluster plot gives us a basic idea of competition in each cluster.

```
#CLUSTERING LOCATIONS
km <- kmeans(cbind(lv_dist_r10$latitude, lv_dist_r10$longitude), centers = 4)

#attach cluster number to each point to calculate cluster mean rating
lv_dist_r10 <- cbind(lv_dist_r10, clust_num = km$cluster)
#calculate mean by cluster
clust_means = aggregate( lv_dist_r10$stars~lv_dist_r10$clust_num,
lv_dist_r10, mean )
clust_means$`lv_dist_r10$stars` =
round(clust_means$`lv_dist_r10$stars`,digits=2)
clust_means = cbind(clust_means, centers = km$centers)

plot(lv_dist_r10$longitude, lv_dist_r10$latitude, col = km$cluster, xlab =
"Longitude", ylab = "Latitude")
plot_legend = clust_means$`lv_dist_r10$stars`
legend("topright", legend = plot_legend, col = km$cluster, pch = 1)
```



From the above plot, we notice that there isnt a drastic difference in the average rating of the different clusters. Rather, we notice that the average tends to be higer in less populated areas. This is due to the sparse density of data points in the region. We can conclude that, even if

someone has a business on the Las Vegas Strip, doesnt really effect the ratings if the service isnt good. Hence, location plays a not so important role in the ratings a business gets.