The MIBE-LSU challenge

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This report consists of detailed analyses of food delivery scene in London evaluated based on both the datasheets, one with the restaurant data and another with restaurant delivery time details. Using R, I have tried to analyze various relationships and extract the required details. I am presenting the detailed analysis below.

Restaurants Information In this section, you will analyze the Restaurant information dataset with the objective of answering the following questions:

1. Present a column chart with the top 10 neighborhoods by the number of restaurants.
2. Present a column chart with the top 10 neighborhoods by restaurant review score.
3. Compute the top 10 biggest chains. Present the results in a tabular format. (Use the column rest_brand to determine restaurants of the same brand)
4. Compute the average menu price and the number of menu items for each restaurant. (The rest_menu_item_price column is a list of characters. You might want to use the by_row and map functions)
5. Present in a bar chart the number of items on the menu for the five most expensive and cheapest restaurants. (The number of items can be determined by counting the elements in the rest_menu_item_price column)

Installing necessary packages

```
#install.packages('ggplot2')
#install.packages('dplyr')
#install.packages("tidyverse")

#install.packages("xlsx")
#install.packages('expss')
#install.packages('gridExtra')
#install.packages('purrrlyr')
#install.packages('ggpubr')
#install.packages('data.table')
```

Importing necessary libraries

```
library(ggpubr)
```

```
## Loading required package: ggplot2
```

```
library(ggplot2)
library(dplyr)
```

```
##
## 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(gridExtra)
```

```
##
## Attaching package: 'gridExtra'
```

```
## The following object is masked from 'package:dplyr':
##
##     combine
```

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.0 --
```

```
## v tibble  3.0.6     v purrr   0.3.4
## v tidyr   1.1.2     v stringr 1.4.0
## v readr   1.4.0     v forcats 0.5.1
```

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

```
library(purrrlyr)
library(data.table)
```

```
##
## Attaching package: 'data.table'
```

```
## The following object is masked from 'package:purrr':
##
##     transpose
```

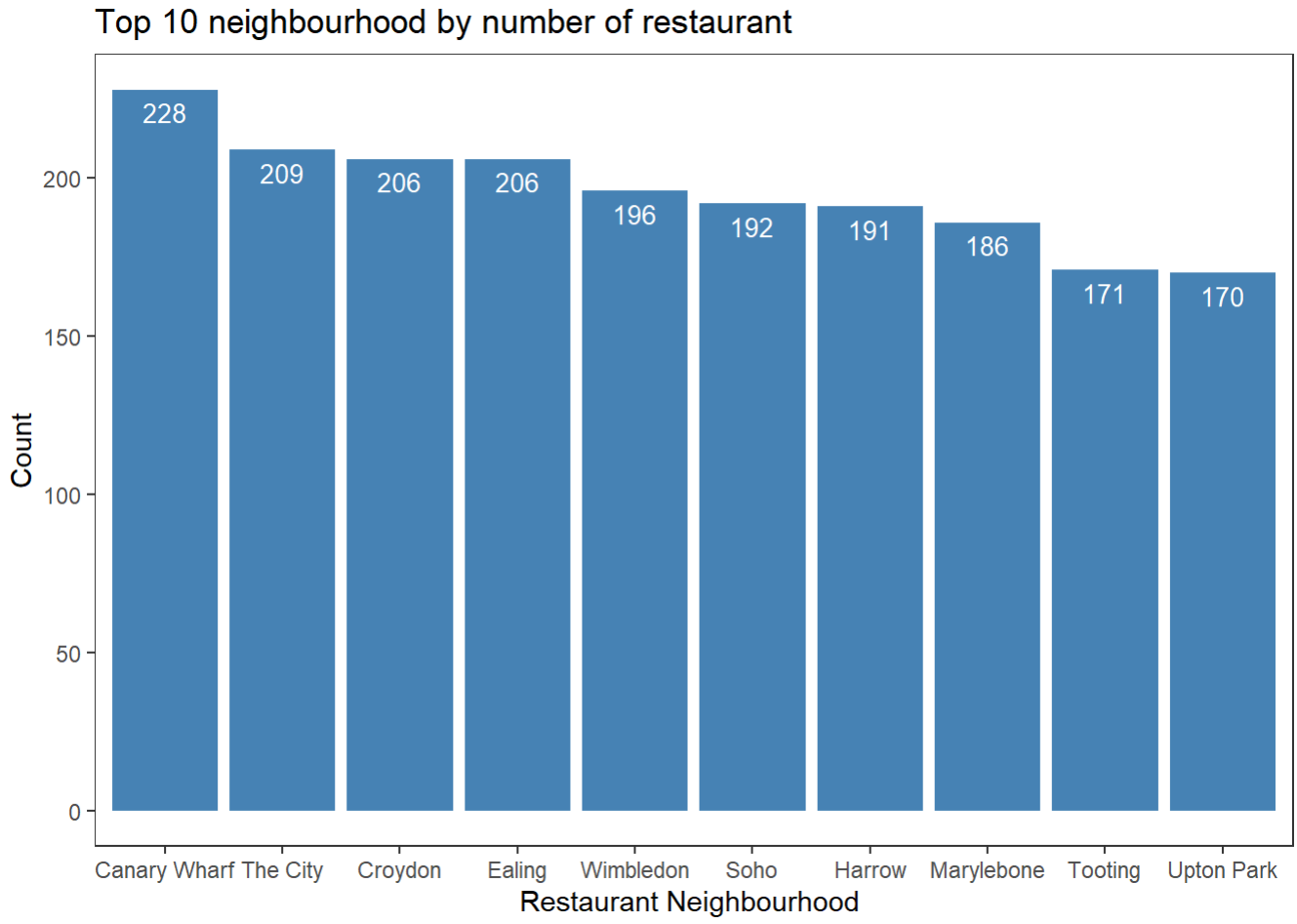
```
## The following objects are masked from 'package:dplyr':
##
##     between, first, last
```

Imporing datasets

```
resturants_mibe <- readRDS("C:/Users/Om Ajay Karthik/Desktop/LSU/resturants-mibe.rds")
delivery_mibe <- readRDS("C:/Users/Om Ajay Karthik/Desktop/LSU/delivery-mibe.rds")
```

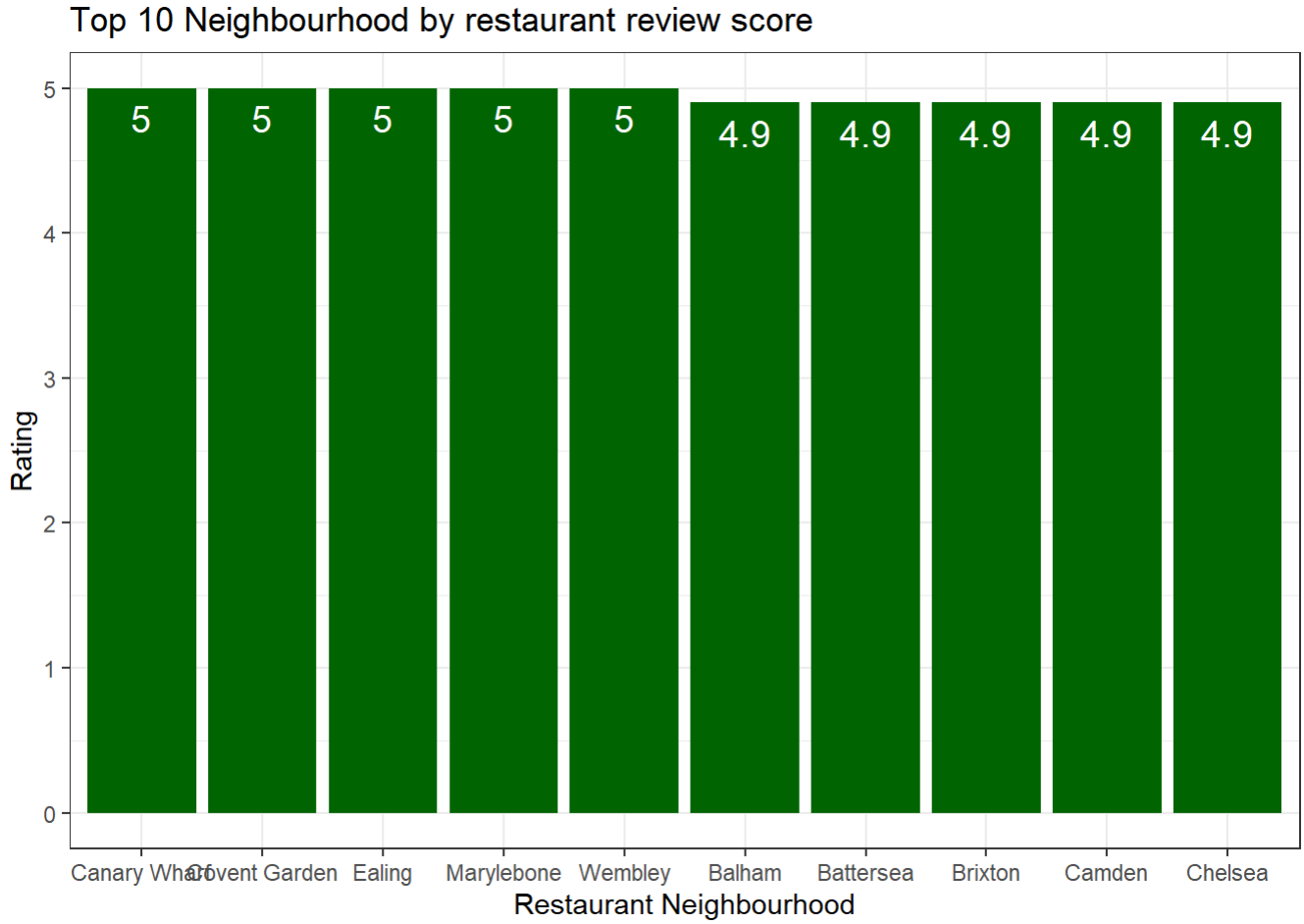
1. Present a column chart with the top 10 neighborhoods by the number of restaurants.

```
freq_rest_neighborhood= count(resturants_mibe, rest_neighborhood)
freq_rest_neighborhood_desc <-freq_rest_neighborhood[order(-freq_rest_neighborhood$n),]
freq_rest_neighborhood_desc_top_n = head(freq_rest_neighborhood_desc, n=10)

ggplot(freq_rest_neighborhood_desc_top_n, aes(x = reorder(rest_neighborhood, -n), y = n)) +
  geom_bar(stat = "identity") +
  geom_bar(stat="identity", fill="steelblue")+
  geom_text(aes(label=n), vjust=1.6, color="white", size=3.5)+
  labs(title = "Top 10 neighbourhood by number of restaurant") +
  xlab("Restaurant Neighbourhood ") +
  ylab("Count") +
  theme_test()
```



2. Present a column chart with the top 10 neighborhoods by restaurant review score.

```
topn_by_review = head(resturants_mibe  %>%
  filter(!is.na(rest_rating))  %>% arrange(-rest_rating,rest_neighborhood) %>% select(rest_neigh
borhood,rest_rating) %>% unique(),n=10)

ggplot(topn_by_review, aes(x = reorder(rest_neighborhood, -rest_rating), y = rest_rating)) +
  geom_bar(stat="identity", fill="darkgreen")+
  geom_text(aes(label=rest_rating), vjust=1.6, color="white", size=5)+
  labs(title = "Top 10 Neighbourhood by restaurant review score") +
  xlab("Restaurant Neighbourhood") +
  ylab("Rating") +
  theme_bw()
```



3. Compute the top 10 biggest chains. Present the results in a tabular format. (Use the column rest_brand to determine restaurants of the same brand)

```
graphics.off()
biggest_chains = resturants_mibe %>% filter(!is.na(rest_brand)) %>%  count(.,rest_brand)
names(biggest_chains)[1] <- "Restaurant_Brand"
names(biggest_chains)[2] <- "Count"
biggest_chains_desc <-biggest_chains[order(-biggest_chains$Count),]
biggest_chains_desc_top_n = head(biggest_chains_desc, n=10)
```

Custom display of of the table since Rmd has a bug while displaying this code:::grid.draw(biggest_chains_desc_top_n):::

```
writeLines("td, th { padding : 6px } th { background-color : brown ; color : white; border : 1px solid white; } td { color : brown ; border : 1px solid brown }", con = "mystyle.css")
dset1 <- head(biggest_chains_desc_top_n,n=10)
knitr::kable(dset1, format = "html")
```

Restaurant_Brand	Count
Get drinks delivered	42
KFC	42
PizzaExpress	42
Pret A Manger	33
Burger King	22
itsu	22
Pure	21
Wasabi	20
LEON	19
Papa John’s	18

4. Compute the average menu price and the number of menu items for each restaurant (The rest_menu_item_price column is a list of characters. You might want to use the by_row and map functions)

```
resturants_mibe_rest_menu_item_price_mean = resturants_mibe %>%
  select(rest_name,rest_brand,rest_menu_item_price) %>%
  by_row(..f = function(this_row) {
    this_row[3] %>% unlist %>% mean})

names(resturants_mibe_rest_menu_item_price_mean)[4] <- "Average_price"

resturants_mibe_rest_menu_item_price_length = resturants_mibe %>%
  select(rest_name,rest_brand,rest_menu_item_price) %>%
  by_row(..f = function(this_row) {
    this_row[3] %>% unlist %>% length()})

names(resturants_mibe_rest_menu_item_price_length)[4] <- "Count_of_menu_items"
```

Average menu price for each resturant(printing only head of 5(top 5))

```
dset1 <- head(resturants_mibe_rest_menu_item_price_mean,n=5)
knitr::kable(dset1, format = "html")
```

rest_name	rest_brand	rest_menu_item_price	Average_price

rest_name	rest_brand	rest_menu_item_price	Average_price
Baba Wali Hendon Broadway	NA	2.80, 4.20, 5.60, 4.20, 5.60, 14.00, 16.80, 4.20, 14.00, 14.00, 14.00, 200.00, 168.00, 84.00, 14.00, 14.00, 11.20, 11.20, 49.00, 14.00, 16.80, 16.80, 11.20, 12.60, 16.80, 42.00, 50.40, 14.00, 12.60, 11.20, 11.20, 12.59, 8.39, 13.99, 9.79, 9.79, 12.59, 2.80, 1.40, 2.10, 2.10, 1.40, 1.40, 1.40, 4.20, 2.80, 2.80, 2.80, 1.40, 5.00, 10.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00	17.05414
Burger & Lobster	Burger & Lobster	0.0, 1.0, 1.5, 1.5, 5.0, 3.0, 25.0, 0.0, 38.0, 0.0, 0.0, 12.5, 9.5, 0.0, 1.5, 1.5, 1.5, 5.0, 5.0, 12.0, 0.0, 75.0, 0.0, 0.0, 27.0, 8.5, 0.0, 0.0, 1.0, 5.0, 3.0, 17.0, 0.0, 33.0, 22.0, 10.0, 0.0, 0.0, 1.5, 1.0, 5.0, 15.0, 0.0, 6.5, 1.5, 0.0, 5.0, 20.0, 0.0, 1.5, 0.0, 1.0, 6.0, 0.0, 1.5, 0.0, 1.5, 0.0, 0.0, 0.0, 0.0	6.42623
Afta Eats	NA	7.49, 5.19, 0.00, 7.49, 5.19, 0.65, 7.49, 5.19, 1.30, 1.49, 5.19, 5.19, 0.00, 5.19, 6.49, 0.00, 5.19, 5.19, 5.19, 6.49, 5.19, 6.49, 5.19, 5.19, 5.19, 5.19, 5.19, 5.19, 5.19, 3.89, 3.89, 3.89, 3.89, 3.89, 3.89, 3.89, 3.89, 5.19, 5.19, 5.19, 5.19, 5.19, 5.19, 1.68, 1.81, 2.98, 3.24, 3.63, 3.89	4.34898
Europa 2 Go Pizza	Europa 2 Go Pizza	9.99, 13.95, 17.95, 17.95, 17.95, 24.95, 14.99, 17.99, 4.49, 4.49, 5.49, 5.49, 3.49, 3.49, 4.49, 4.49, 4.49, 4.49, 5.49, 5.49, 5.49, 1.95, 2.95, 3.00, 3.50, 3.95, 4.95, 3.95, 3.95, 4.50, 4.50, 2.50, 2.95, 3.95, 2.50, 1.50, 0.95, 2.50, 3.00, 3.00, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 5.99, 6.45, 6.45, 6.45, 6.45, 6.45, 6.99, 6.99, 6.99, 6.99, 6.99, 6.99, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.99, 9.45, 9.45, 9.45, 9.45, 9.45, 9.99, 9.99, 9.99, 9.99, 9.99, 9.99, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 9.99, 11.45, 11.45, 11.45, 11.45, 11.45, 11.99, 11.99, 11.99, 11.99, 11.99, 11.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 3.00, 3.20, 4.00, 1.95, 3.00, 3.00, 3.00, 3.00, 1.50, 3.00, 1.70, 3.00, 3.50, 3.50, 3.50, 1.10, 4.50, 5.49, 4.50, 2.50, 3.95, 3.95, 3.95, 0.95, 0.95, 0.50, 5.95, 3.99, 3.99, 2.50, 2.50, 2.50, 0.90, 0.90, 0.90, 0.90, 0.90, 0.90, 0.90, 0.90, 0.00, 0.50, 1.00, 1.50, 0.50, 0.50, 0.50, 0.60, 1.50, 2.00, 0.60, 0.60, 0.60, 0.80, 2.00, 2.50, 0.80, 0.80, 0.80, 1.00, 2.50, 3.00, 1.00, 1.00, 1.00, 0.00, 1.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.00, 1.90, 3.90, 8.40, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.60, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00	3.42838

rest_name	rest_brand	rest_menu_item_price	Average_price
Julia Domna Cafe	NA	5.53, 11.48, 13.79, 7.70, 8.33, 6.93, 9.03, 7.35, 8.33, 6.30, 4.90, 5.46, 8.12, 8.33, 9.10, 15.40, 8.12, 7.63, 7.28, 9.10, 12.60, 6.30, 6.65, 6.65, 8.05, 6.93, 8.05, 8.05, 8.33, 7.00, 9.10, 9.10, 9.10, 6.65, 7.35, 7.00, 9.10, 9.59, 9.10, 8.40, 8.05, 8.75, 8.05, 8.38, 7.70, 14.70, 14.70, 14.70, 8.40, 5.60, 5.95, 4.20, 4.55, 4.55, 4.55, 3.86, 4.20, 4.20, 4.20, 3.50, 3.50, 4.20, 3.85, 5.60	7.675781

No of items on the menu for each resturant (printing only head of 5(top 5))

```
dset1 <- head(resturants_mibe_rest_menu_item_price_length,n=5)
knitr::kable(dset1, format = "html")
```

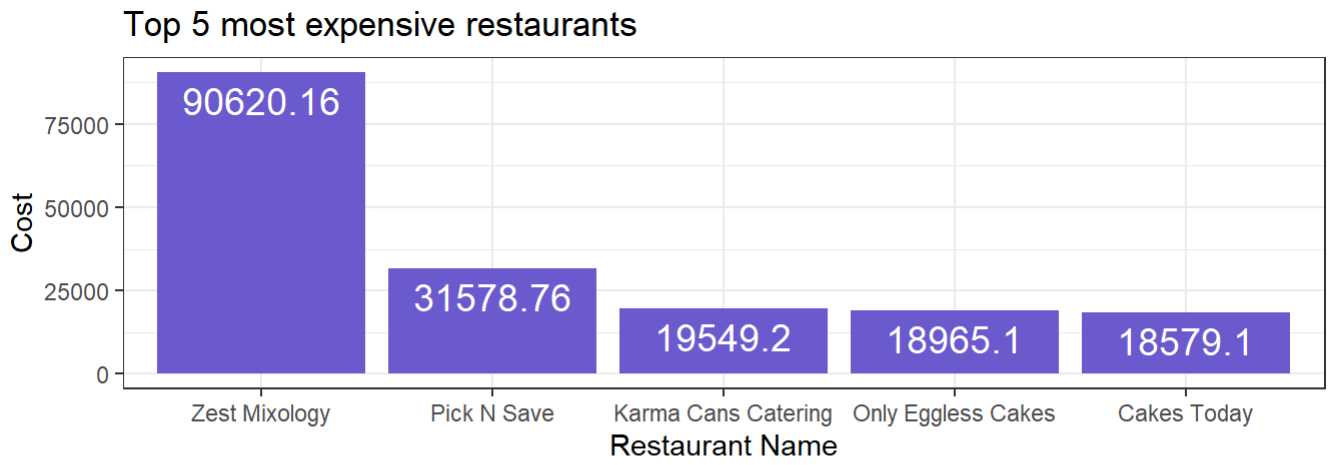
rest_name	rest_brand	rest_menu_item_price	Count_of_menu_items
Baba Wali Hendon Broadway	NA	2.80, 4.20, 5.60, 4.20, 5.60, 14.00, 16.80, 4.20, 14.00, 14.00, 14.00, 200.00, 168.00, 84.00, 14.00, 14.00, 11.20, 11.20, 49.00, 14.00, 16.80, 16.80, 11.20, 12.60, 16.80, 42.00, 50.40, 14.00, 12.60, 11.20, 11.20, 12.59, 8.39, 13.99, 9.79, 9.79, 12.59, 2.80, 1.40, 2.10, 2.10, 1.40, 1.40, 1.40, 4.20, 2.80, 2.80, 2.80, 1.40, 5.00, 10.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00	58
Burger & Lobster	Burger & Lobster	0.0, 1.0, 1.5, 1.5, 5.0, 3.0, 25.0, 0.0, 38.0, 0.0, 0.0, 12.5, 9.5, 0.0, 1.5, 1.5, 1.5, 5.0, 5.0, 12.0, 0.0, 75.0, 0.0, 0.0, 27.0, 8.5, 0.0, 0.0, 1.0, 5.0, 3.0, 17.0, 0.0, 33.0, 22.0, 10.0, 0.0, 0.0, 1.5, 1.0, 5.0, 15.0, 0.0, 6.5, 1.5, 0.0, 5.0, 20.0, 0.0, 1.5, 0.0, 1.0, 6.0, 0.0, 1.5, 0.0, 1.5, 0.0, 0.0, 0.0, 0.0	61
Afta Eats	NA	7.49, 5.19, 0.00, 7.49, 5.19, 0.65, 7.49, 5.19, 1.30, 1.49, 5.19, 5.19, 0.00, 5.19, 6.49, 0.00, 5.19, 5.19, 5.19, 6.49, 5.19, 6.49, 5.19, 5.19, 5.19, 5.19, 5.19, 5.19, 5.19, 5.19, 3.89, 3.89, 3.89, 3.89, 3.89, 3.89, 3.89, 3.89, 5.19, 5.19, 5.19, 5.19, 5.19, 5.19, 1.68, 1.81, 2.98, 3.24, 3.63, 3.89	49

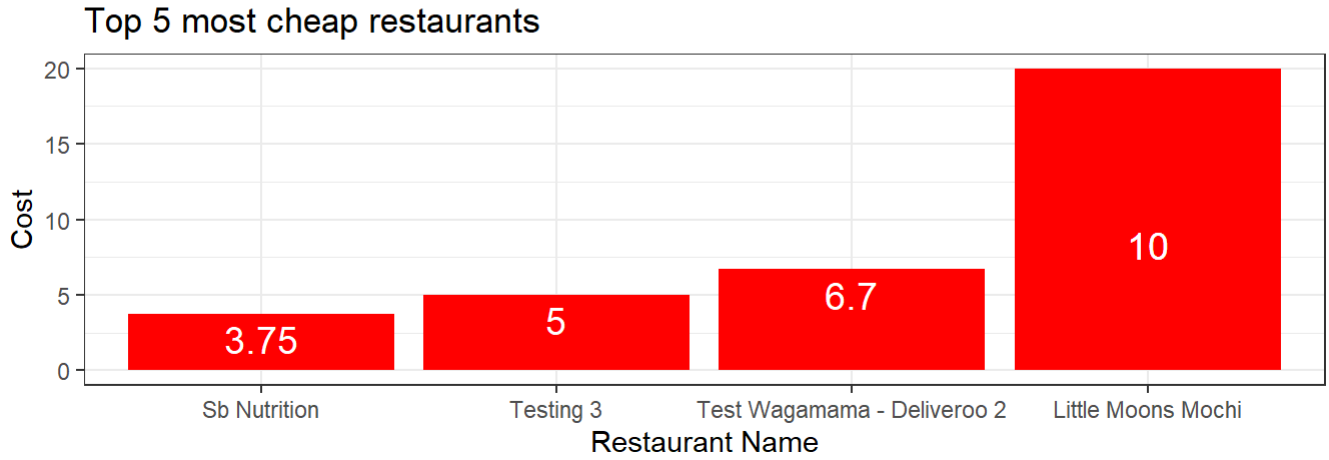
rest_name	rest_brand	rest_menu_item_price	Count_of_menu_items
Europa 2 Go Pizza	Europa 2 Go Pizza	9.99, 13.95, 17.95, 17.95, 17.95, 24.95, 14.99, 17.99, 4.49, 4.49, 5.49, 5.49, 3.49, 3.49, 4.49, 4.49, 4.49, 4.49, 5.49, 5.49, 5.49, 1.95, 2.95, 3.00, 3.50, 3.95, 4.95, 3.95, 3.95, 4.50, 4.50, 2.50, 2.95, 3.95, 2.50, 1.50, 0.95, 2.50, 3.00, 3.00, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.50, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 3.99, 5.99, 6.45, 6.45, 6.45, 6.45, 6.45, 6.99, 6.99, 6.99, 6.99, 6.99, 6.99, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.49, 7.99, 9.45, 9.45, 9.45, 9.45, 9.45, 9.99, 9.99, 9.99, 9.99, 9.99, 9.99, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 10.49, 9.99, 11.45, 11.45, 11.45, 11.45, 11.45, 11.99, 11.99, 11.99, 11.99, 11.99, 11.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 12.99, 3.00, 3.20, 4.00, 1.95, 3.00, 3.00, 3.00, 3.00, 1.50, 3.00, 1.70, 3.00, 3.50, 3.50, 3.50, 1.10, 4.50, 5.49, 4.50, 2.50, 3.95, 3.95, 3.95, 0.95, 0.95, 0.50, 5.95, 3.99, 3.99, 2.50, 2.50, 2.50, 0.90, 0.90, 0.90, 0.90, 0.90, 0.90, 0.90, 0.90, 0.00, 0.50, 1.00, 1.50, 0.50, 0.50, 0.50, 0.60, 1.50, 2.00, 0.60, 0.60, 0.60, 0.80, 2.00, 2.50, 0.80, 0.80, 0.80, 1.00, 2.50, 3.00, 1.00, 1.00, 1.00, 0.00, 1.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.00, 1.90, 3.90, 8.40, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 1.60, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00	389
Julia Domna Cafe	NA	5.53, 11.48, 13.79, 7.70, 8.33, 6.93, 9.03, 7.35, 8.33, 6.30, 4.90, 5.46, 8.12, 8.33, 9.10, 15.40, 8.12, 7.63, 7.28, 9.10, 12.60, 6.30, 6.65, 6.65, 8.05, 6.93, 8.05, 8.05, 8.33, 7.00, 9.10, 9.10, 9.10, 6.65, 7.35, 7.00, 9.10, 9.59, 9.10, 8.40, 8.05, 8.75, 8.05, 8.38, 7.70, 14.70, 14.70, 14.70, 8.40, 5.60, 5.95, 4.20, 4.55, 4.55, 4.55, 3.86, 4.20, 4.20, 4.20, 3.50, 3.50, 4.20, 3.85, 5.60	64

5. Present in a bar chart the number of items on the menu for the five most expensive and cheapest restaurants.(The number of items can be determined by counting the elements in the

rest_menu_item_price column)

```
menu_item_price_sum = resturants_mibe %>% select(rest_name,rest_neighborhood,rest_menu_item_pric
e) %>% filter(!is.na(rest_menu_item_price )) %>% by_row(..f = function(this_row) {
  this_row[3] %>% unlist %>% sum()})

names(menu_item_price_sum)[4] <- "sum_of_price"
menu_item_price_sum$sum_of_price = as.numeric(as.character(menu_item_price_sum$sum_of_price))


menu_item_sum_top_5 = head(arrange(menu_item_price_sum,desc(sum_of_price)), n = 5)
menu_item_sum_bottom_5 = head(arrange(menu_item_price_sum,sum_of_price), n = 5)

expensive = ggplot(menu_item_sum_top_5, aes(x = reorder(rest_name, -sum_of_price), y = sum_of_pr
ice)) +
  geom_bar(stat="identity", fill="slateblue")+
  geom_text(aes(label=sum_of_price), vjust=1.5, color="white", size=5)+
  labs(title = "Top 5 most expensive restaurants") +
  xlab("Restaurant Name") +
  ylab("Cost") +
  theme_bw()

cheapest = ggplot(menu_item_sum_bottom_5, aes(x = reorder(rest_name, sum_of_price), y = sum_of_p
rice)) +
  geom_bar(stat="identity", fill="red")+
  geom_text(aes(label=sum_of_price), vjust=1.4, color="white", size=5)+
  labs(title = "Top 5 most cheap restaurants") +
  xlab("Restaurant Name") +
  ylab("Cost") +
  theme_bw()


grid.arrange(expensive, cheapest)
```


Top 5 most expensive restaurants
Cost
75000
50000
25000
0
90620.16
31578.76
19549.2
18965.1
18579.1
Zest Mixology
Pick N Save
Karma Cans Catering
Only Eggless Cakes
Cakes Today
Restaurant Name


Top 5 most cheap restaurants
Cost
20
15
10
5
0
3.75
5
6.7
10
Sb Nutrition
Testing 3
Test Wagamama - Deliveroo 2
Little Moons Mochi
Restaurant Name