Italian Restaurant analysis

2025-01-07

My analysis starts here

- Dataset consists of 10000 observations and 9 variables for the calender year 2024.

- Variables : Date ,Time ,Menu item , Category , Quantity purchased ,Price per item , Revenue , Payment method , Customer type
- No null observations
- Currency : Euro

```
library(readr)
library(tidyverse)
library(readxl)
library(sqldf)
library(stringr)
library(knitr)

df <-read_excel('C:\\Users\\karab\\Videos\\JOB_Projects\\Italian_resteurant_dataset.xlsx')
head(df)
```

```
## # A tibble: 6 x 9
##   Date       Time     `Menu Item`   Category Quantity `Price (per item)` Revenue
##   <chr>      <chr>    <chr>         <chr>       <dbl>               <dbl>   <dbl>
## 1 2024-11-23 03:48 AM Margherita P~ Main Co~        3                10        30
## 2 2024-03-12 03:29 AM Caprese Salad Appetiz~        1                 8         8
## 3 2024-01-17 01:01 AM Tiramisu      Dessert         2                 6.5      13
## 4 2024-11-04 12:54 AM Caprese Salad Appetiz~        2                 8        16
## 5 2024-12-25 06:36 PM Gelato        Dessert         2                 4.5       9
## 6 2024-05-22 12:13 AM Spaghetti Ca~ Main Co~        4                12        48
## # i 2 more variables: `Payment Method` <chr>, `Customer Type` <chr>
```

```
# Problem with date, convert to date
data<-df
data$Date<-as.Date(data$Date)

data <-data %>%mutate(AM_PM=str_extract(Time,'AM|PM'),Month=months.Date(Date),
                      Week_day=weekdays(Date))%>%select(-c(Date,Time))


mat <-matrix(0,nrow = 3,ncol = 2)
mat[,1]<-c('Price','Revenue','Quantity purchased')
mat[,2]<-c(round(mean(data$`Price (per item)`),2) , round(mean(data$Revenue),2) , round(mean(data$Quanti
colnames(mat)<- c('-','Average')
kable(mat)
```

-	Average
Price	8.32
Revenue	24.77
Quantity purchased	3

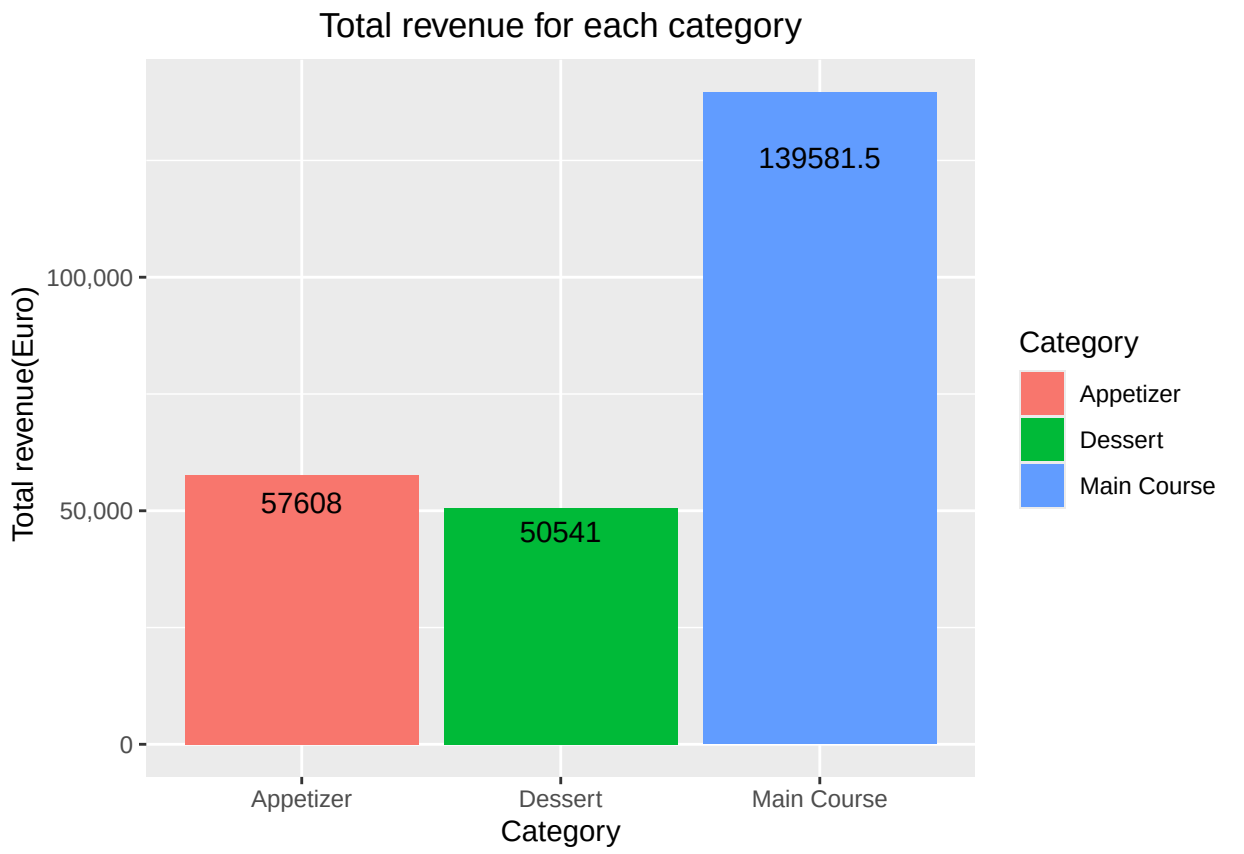
```
####
print('Total revenue for each Category')
```

```
## [1] "Total revenue for each Category"
```

```
revenue_by_category <- data %>% select(Category,`Price (per item)`,Revenue,Quantity) %>%
  group_by(Category) %>% summarise(Average_price=round(mean(`Price (per item)`),2) , Total_customers= le
  Quantities_purchased=sum(Quantity) ,Total_revenue=sum(Revenue)) %>% arrange(desc(Total_revenue))
kable(revenue_by_category)
```

Category	Average_price	Total_customers	Quantities_purchased	Total_revenue
Main Course	11.65	4035	11985	139581.5
Appetizer	6.67	2902	8633	57608.0
Dessert	5.52	3063	9162	50541.0

```
revenue_by_category %>% ggplot(aes(x=Category,y=Total_revenue)) + geom_bar(stat='Identity',
aes(fill = Category)) + scale_y_continuous(labels =scales::comma ) +
  geom_text(aes(label = Total_revenue),position = position_stack(vjust=0.9)) +
  labs(title = 'Total revenue for each category', y=' Total revenue(Euro)') +
  theme(plot.title = element_text(hjust = 0.5))
```




```
####
```

Total revenue per Category for each menu item'

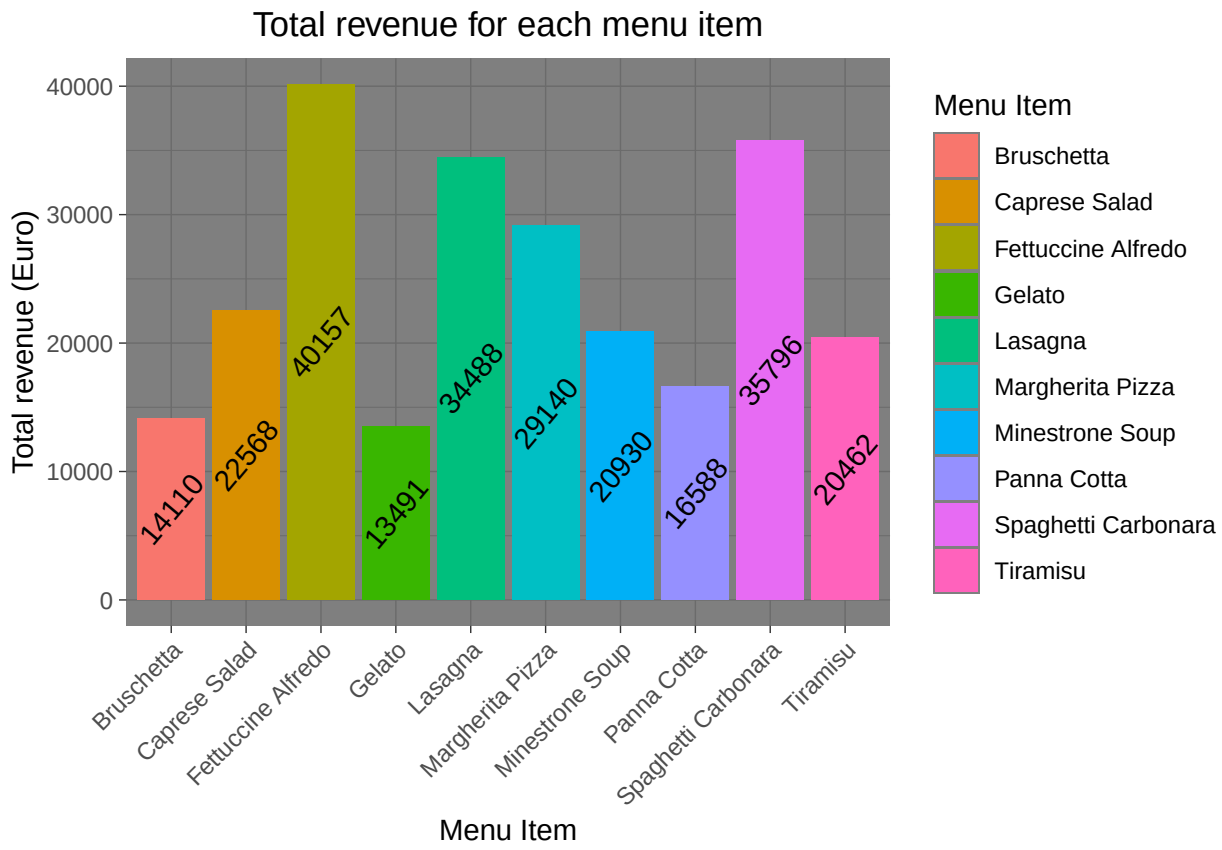
```
Revenue_per_category_by_menu_item <- data %>% select(Category,Quantity,`Menu Item`,Revenue)%>%
  group_by(Category,`Menu Item`) %>% summarise(Total_customers=length(`Menu Item`),

kable(Revenue_per_category_by_menu_item)
```

Category	Menu Item	Total_customers	Total_quantity	Total_Revenue
Appetizer	Bruschetta	958	2822	14110
Appetizer	Caprese Salad	945	2821	22568
Appetizer	Minestrone Soup	999	2990	20930
Dessert	Gelato	987	2998	13491
Dessert	Panna Cotta	1024	3016	16588
Dessert	Tiramisu	1052	3148	20462
Main Course	Fettuccine Alfredo	1036	3089	40157
Main Course	Lasagna	1012	2999	34488
Main Course	Margherita Pizza	978	2914	29140
Main Course	Spaghetti Carbonara	1009	2983	35796

```
Revenue_per_category_by_menu_item %>% ggplot(aes(x=`Menu Item`,y=Total_Revenue,fill = `Menu Item`)) +
  geom_bar(stat='Identity') +labs(title = 'Total revenue for each menu item',y= 'Total revenue (Euro)')
```

```
  theme_dark()+theme(axis.text.x = element_text(angle = 45,hjust=1),
                     plot.title = element_text(hjust = 0.5))
```




```
####
```

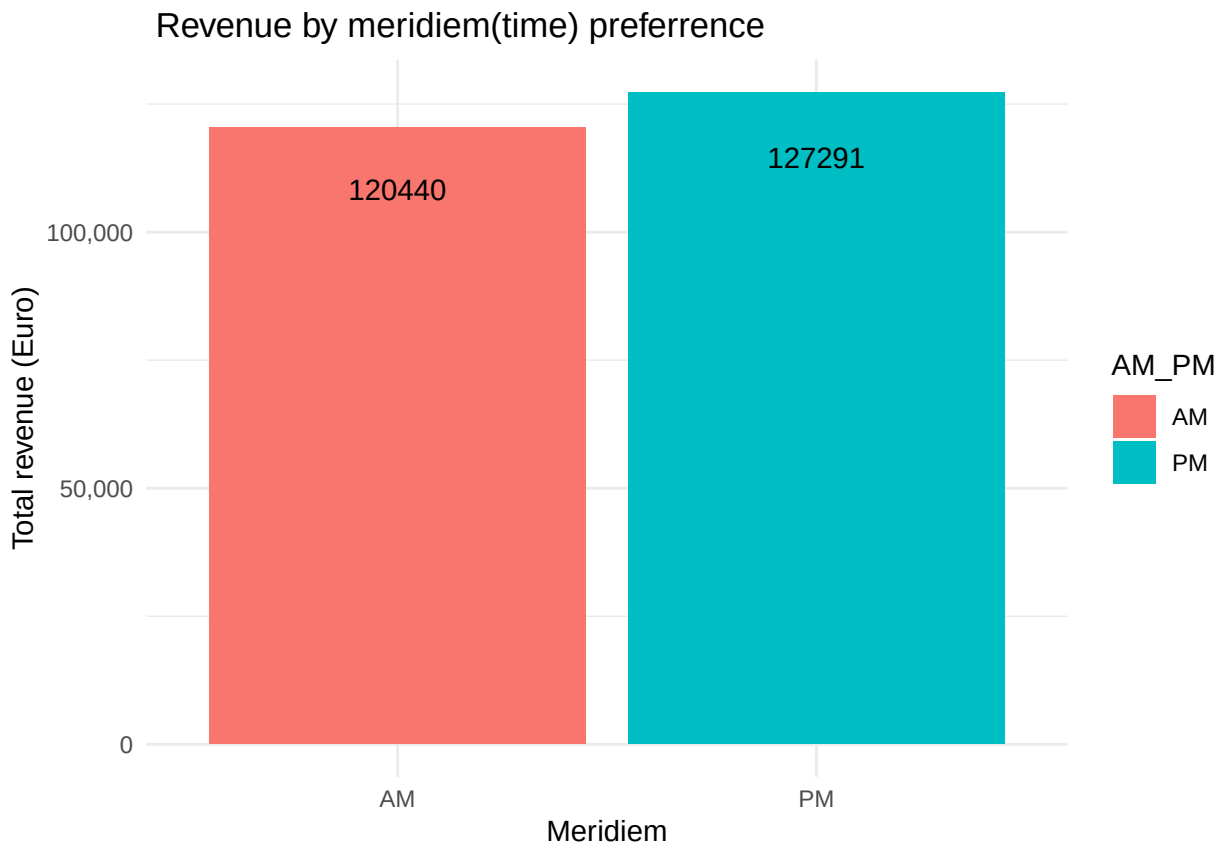
Customer time preference (AM or PM)

```
customer_preferred_time <- data%>% select(AM_PM,Revenue) %>%
  group_by(AM_PM)%>%
summarise(Total_customers=length(AM_PM),Revenue=round(sum(Revenue)))

kable(customer_preferred_time)
```

AM_PM	Total_customers	Revenue
AM	4887	120440
PM	5113	127291

```
customer_preferred_time %>% ggplot(aes(x=AM_PM,y=Revenue,fill = AM_PM)) +
  geom_bar(stat='Identity') + labs(title = ' Revenue by meridiem(time) preferrence ',
  y='Total revenue (Euro)',x='Meridiem') + geom_text(aes(label = Revenue),
 position = position_stack(vjust=0.9)) + scale_y_continuous(labels = scales::comma) +theme_minimal()
```



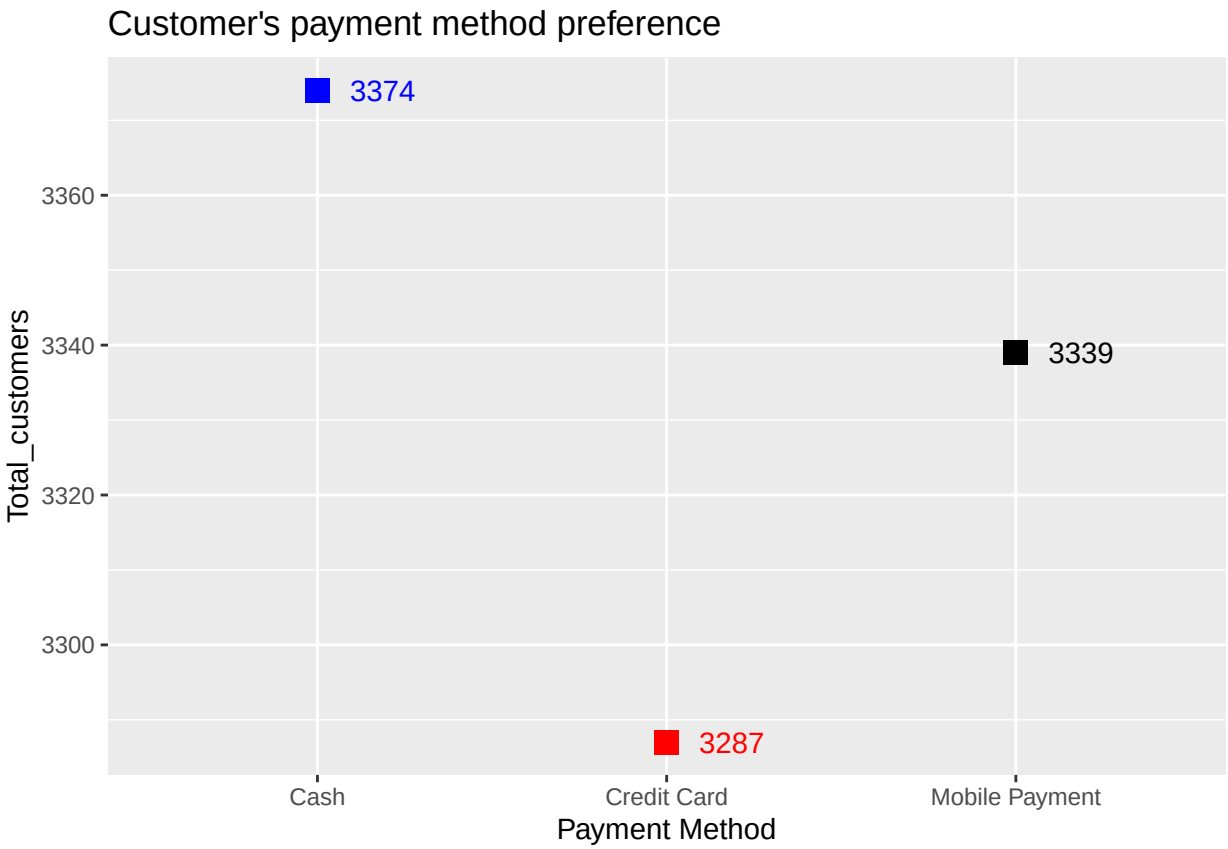

```
####
```

Customer Payment Preference

```
payment_preference<- data%>% select(`Payment Method`) %>%group_by(`Payment Method`) %>%
  summarise(Total_customers=length(`Payment Method`)) %>% arrange(Total_customers)
kable(payment_preference)
```

Payment Method	Total_customers
Credit Card	3287
Mobile Payment	3339
Cash	3374

```
payment_preference %>% ggplot(aes(x=`Payment Method`,y=Total_customers))+
  geom_point(col=c('red','black','blue'),size=4,shape=15)+
  labs( title = "Customer's payment method preference") +
  theme(plot.title = element_text(hjust=0.4))+theme_classic() +
  geom_text(aes(label = Total_customers),
            hjust=-0.5,col=c('red','black','blue'))+theme_gray()
```




```
####
```

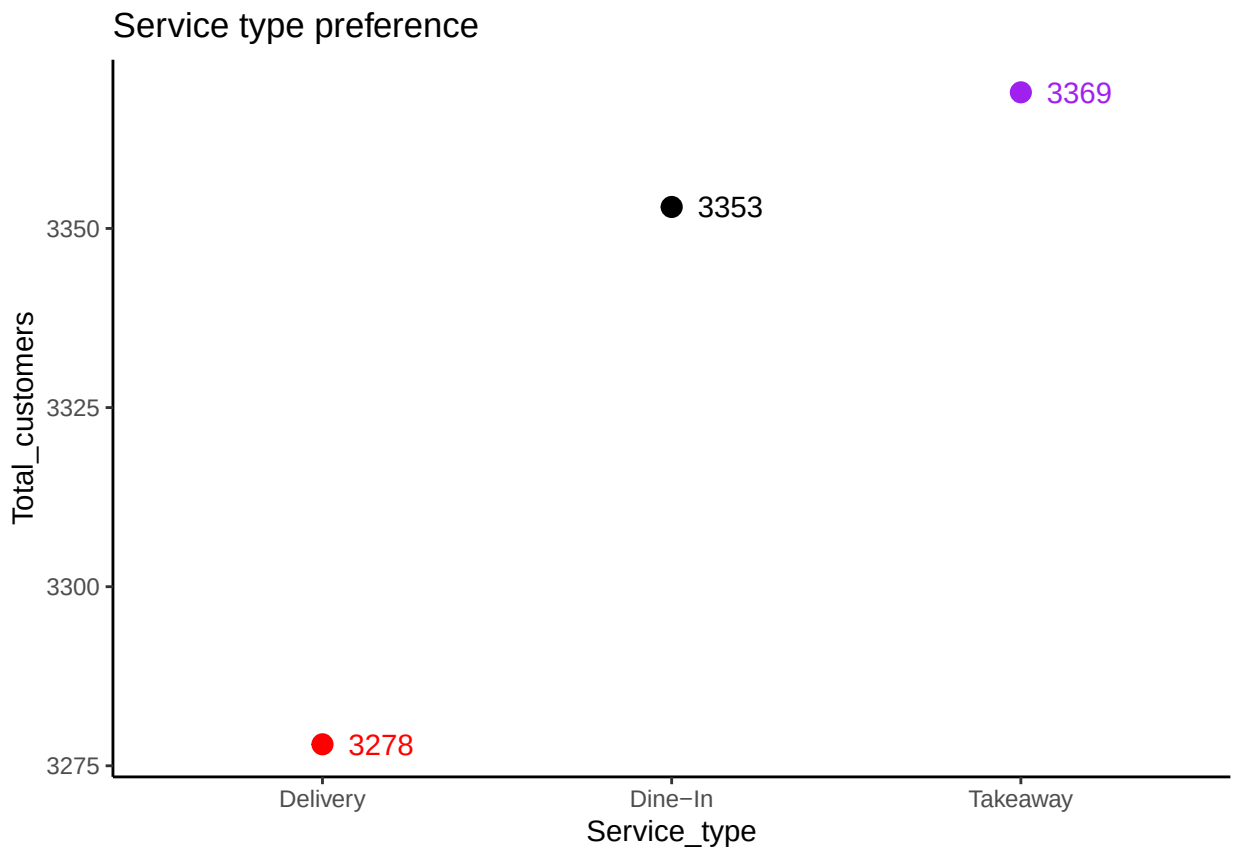
customer type in terms of food distribution

```
customer_type<-data %>% select(`Customer Type`)%>%group_by(`Customer Type`) %>%
  summarise(Total_customers=length(`Customer Type`)) %>%
  arrange(Total_customers) %>%rename(Service_type=`Customer Type`)

kable(customer_type)
```

Service_type	Total_customers
Delivery	3278
Dine-In	3353
Takeaway	3369

```
customer_type%>%ggplot(aes(x=Service_type,y=Total_customers)) +
  geom_point(col=c('red','black','purple'),size=5,shape=20) +theme_classic() +
  geom_text(aes(label = Total_customers),hjust=-0.4,col=c('red','black','purple'))+
  labs(title = "Service type preference")+theme(element_text(hjust = 0.5))
```




```
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```

Monthly Revenue

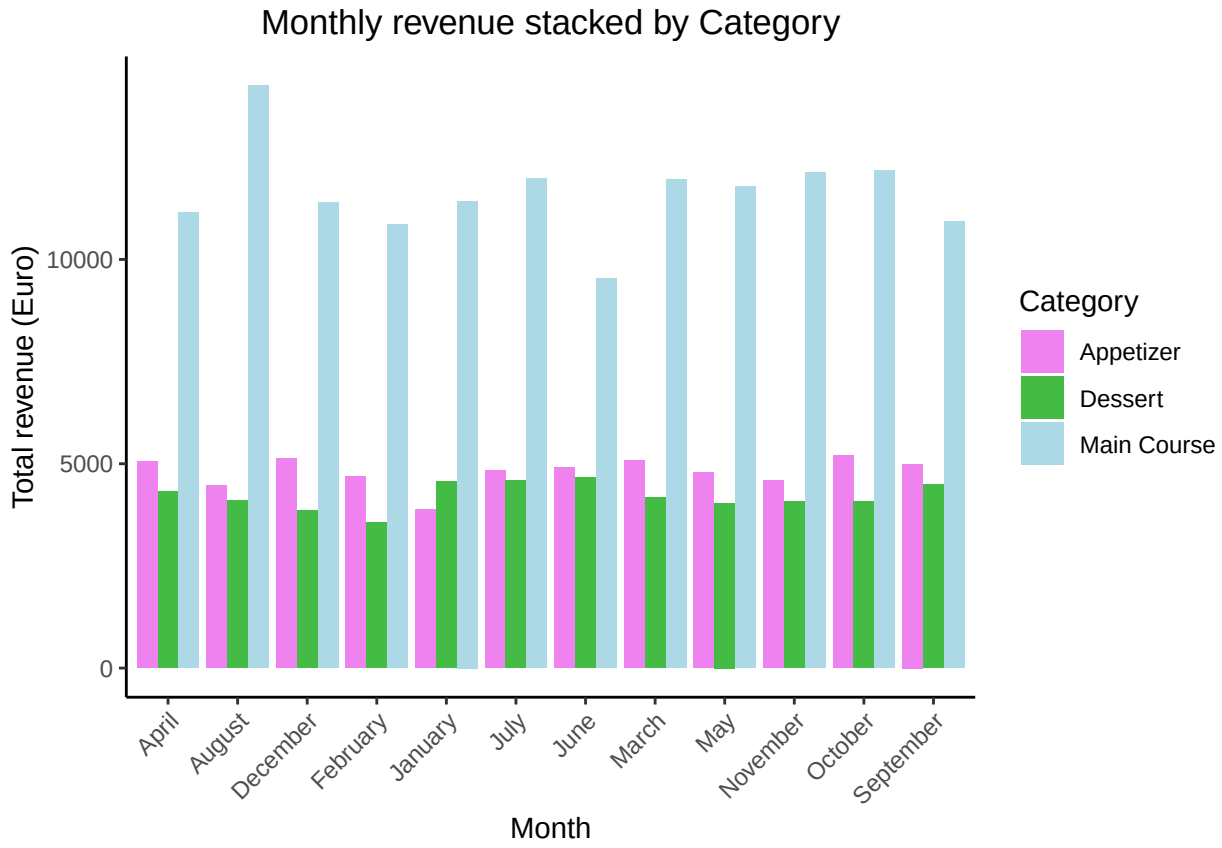
```
monthly_revenue <- data %>% select(Month,Revenue,Category) %>% group_by(Month,Category)%>%
  summarise(Total_revenue= round(sum(Revenue))) %>%
  arrange(factor(Month,levels = c("January","February","March","April", "May" ,"June",
   "July", "August","September" ,"October","November","December" )))

kable(monthly_revenue%>%select(Month,Total_revenue) %>% group_by(Month) %>%
        summarise(Total_revenue=sum(Total_revenue)))
```

Month	Total_revenue
April	20522
August	22827
December	20382
February	19112
January	19871
July	21411
June	19110
March	21217
May	20614
November	20804
October	21448

Month	Total_revenue
September	20410

```
monthly_revenue %>% ggplot(aes(x=Month,y=Total_revenue,fill = Category))+
  geom_bar(stat = 'Identity',position = 'dodge') + labs(y='Total revenue (Euro)',
 title = 'Monthly revenue stacked by Category')+
  scale_fill_manual(values = c('Violet','#4B4','lightblue')) +
  theme_classic() +theme(axis.text.x=element_text(angle = 45,hjust = 1),
                         plot.title = element_text(hjust=0.5))
```




```
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```

Weekdays revenue

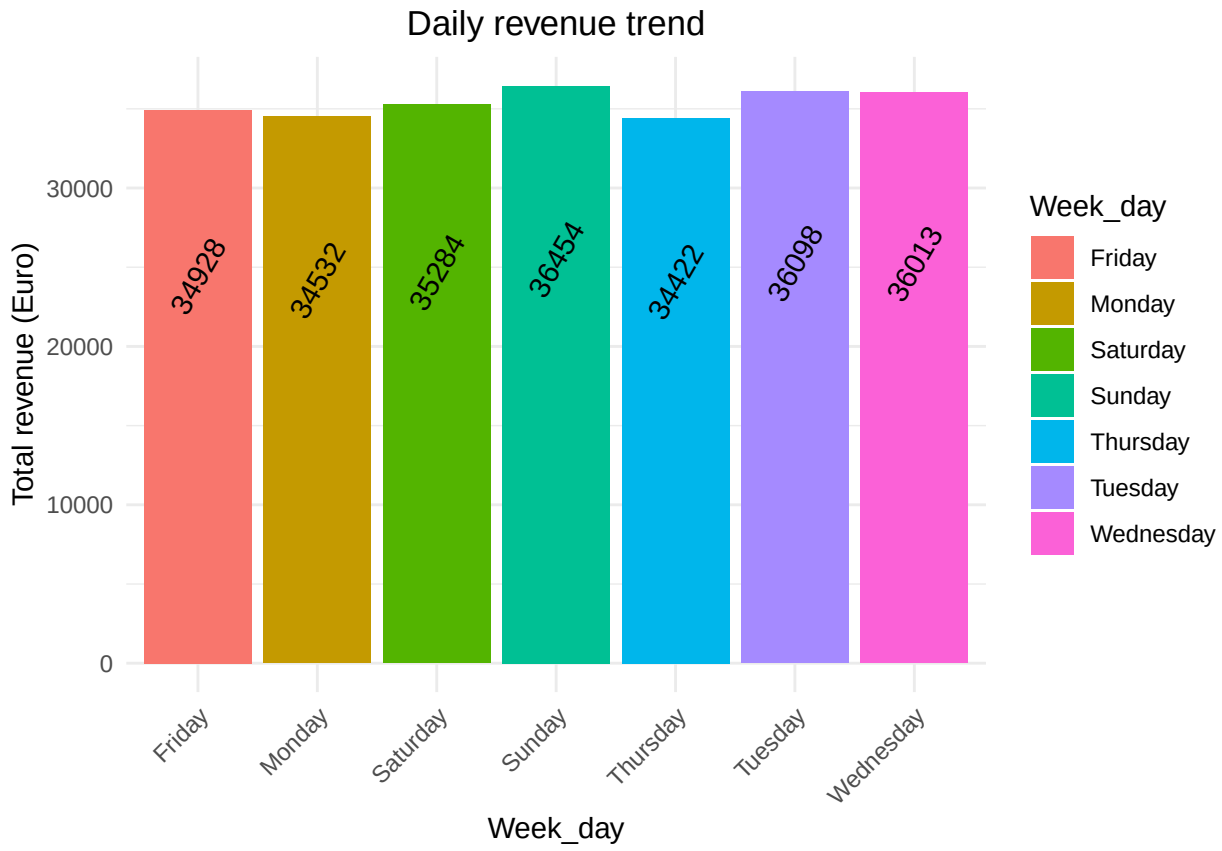
```
weekly_revenue <- data %>% select(Week_day,Revenue) %>% group_by(Week_day) %>%
  summarise(Total_revenue= round(sum(Revenue))) %>% arrange(factor(Week_day,
  levels = c("Monday" ,"Tuesday","Wednesday" ,"Thursday","Friday","Saturday","Sunday" )))

kable(weekly_revenue)
```

Week_day	Total_revenue
Monday	34532

Week_day	Total_revenue
Tuesday	36098
Wednesday	36013
Thursday	34422
Friday	34928
Saturday	35284
Sunday	36454

```
weekly_revenue %>% ggplot(aes(x=Week_day,y=Total_revenue,fill = Week_day))+
  geom_bar(stat = 'Identity') + theme_minimal() +labs(title = 'Daily revenue trend',
  y='Total revenue (Euro)')+ theme(plot.title = element_text(hjust = 0.5),
 axis.text.x=element_text(angle = 45,hjust = 1)) +
  geom_text(aes(label = Total_revenue),angle=60,position = position_stack(vjust=0.7))
```




```
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```

Insights

- Food items from the *Main course* category generates more revenue(139581.5 Euros) than the *Appetizer* and *Dessert* categories, with Dessert generating the least revenue(50541 Euros) among the three categories
- *Fettuccine Alfredo* and *Toramisu* are the most liked food items by customers, *Caprese Salad* is the least favourite

- *Fettuccine Alfredo* ,*Spaghetti Carbonara* and *Lasagna* are the top three revenue generating food items, *Gelato* and *Panna Cotta* generate way less revenue
- Most customers buy more in the Afternoon or Evening (PM) than they do in the Morning (AM), hence the Restaurant generates more revenue in post meridiem (PM)
- Most customer prefer paying *cash* compared to the likes of *Credit card* and *Mobile payment*
- Most customers prefer *Takeaways* than *Delivery* and *eating in-store*
- *August* and *October* generated the most revenue with *June* and *February* generating lowest revenue
- The revenue of the weekdays is quite negligible, the difference is barely visible, but *Sunday* seems to generate more revenue than the other weekdays, with *Monday* generating the least revenue