```r
store_data <- data.frame(
  StoreID = 1:48,
  Region = rep(c("North", "South", "East", "West"), 12),
  Month = rep(c("January","February","March","April","May","June",
            "July","August","September","October","November","December"),
          each = 4),
  TotalSales = c(
    10000,15000,12000,13000,
    9000,16000,14000,11000,
    11000,17000,13000,15000,
    12000,18000,16000,14000,
    13000,19000,15000,16000,
    14000,20000,17000,15000,
    15000,21000,16000,14000,
    16000,22000,13000,15000,
    12000,18000,16000,14000,
    13000,19000,15000,16000,
    14000,20000,17000,15000,
    15000,21000,16000,14000
  ),
  NumberOfCustomers = c(
    500,700,600,650,
    450,800,700,550,
    550,850,650,750,
    600,900,800,700,
    650,950,750,800,
    700,1000,850,750,
    750,1050,800,700,
    800,1100,650,750,
    600,900,800,700,
    650,950,750,800,
```

```r
    700,1000,850,750,
    750,1050,800,700
  ),
  AvgTransactionValue = c(20,21.43,20,20,20,20,20,20,20,20,20,20,
                20,20,20,20,20,20,20,20,20,20,20,20,
                20,20,20,20,20,20,20,20,20,20,20,20,
                20,20,20,20,20,20,20,20,20,20,20,20)
)

library(dplyr)
library(ggplot2)
library(plotly)
library(tidyr)
library(lubridate)

# Check missing values
sum(is.na(store_data))

# Convert Month to ordered factor
store_data$Month <- factor(store_data$Month,
                levels = month.name)

monthly_sales <- store_data %>%
  group_by(Month) %>%
  summarize(TotalSales = sum(TotalSales))

regional_sales <- store_data %>%
  group_by(Region) %>%
  summarize(TotalSales = sum(TotalSales),
        Customers = sum(NumberOfCustomers))
```

```r
ggplot(regional_sales, aes(x=Region, y=TotalSales, fill=Region)) +
  geom_bar(stat="identity") +
  ggtitle("Total Sales by Region")


ggplot(monthly_sales, aes(Month, TotalSales, group=1)) +
  geom_line(color="blue") +
  geom_point(size=3) +
  ggtitle("Monthly Sales Trend")


ggplot(store_data, aes(StoreID, TotalSales, color=Region)) +
  geom_point(size=3) +
  ggtitle("Store-wise Total Sales")


ggplot(store_data, aes(Month, NumberOfCustomers, fill=Region)) +
  geom_bar(stat="identity", position="dodge") +
  ggtitle("Customer Count per Month")


mean_ATV <- mean(store_data$AvgTransactionValue)
median_ATV <- median(store_data$AvgTransactionValue)
sd_ATV <- sd(store_data$AvgTransactionValue)


print(mean_ATV)
print(median_ATV)
print(sd_ATV)


ggplot(monthly_sales, aes(as.numeric(Month), TotalSales)) +
  geom_point() +
  geom_smooth(method="lm", color="red") +
  ggtitle("Trendline of Monthly Sales")


ggplot(regional_sales, aes(TotalSales, Customers, color=Region)) +
```

```r
  geom_point(size=5) +

  ggtitle("Region Sales vs Customers")


plot_ly(store_data,

    x = ~TotalSales,

    y = ~NumberOfCustomers,

    z = ~AvgTransactionValue,

    type = "scatter3d",

    mode = "markers",

    color = ~Region)


# 13. Boxplot by region

ggplot(store_data, aes(Region, TotalSales)) + geom_boxplot()


# 14. Histogram of sales

ggplot(store_data, aes(TotalSales)) + geom_histogram()


# 15. Density plot

ggplot(store_data, aes(TotalSales, fill=Region)) + geom_density(alpha=0.5)


# 16. Customers trendline

ggplot(store_data %>% group_by(Month) %>% summarise(Cust=sum(NumberOfCustomers)),

    aes(Month, Cust, group=1)) +

  geom_line() + geom_point()


# 17. Scatter: Sales vs Customers

ggplot(store_data, aes(NumberOfCustomers, TotalSales, color=Region)) + geom_point()


# 18. Pie Chart of Regional Sales

ggplot(regional_sales, aes(x="", y=TotalSales, fill=Region)) +

  geom_bar(stat="identity", width=1) + coord_polar("y")
```

19. Facet by Region

```
ggplot(store_data, aes(Month, TotalSales)) +
  geom_line(aes(group=Region, color=Region)) +
  facet_wrap(~Region)
```

20. Heatmap: Sales by Region & Month

```
ggplot(store_data, aes(Region, Month, fill=TotalSales)) +
  geom_tile()
```

21. 3D bar: Month & Region

```
plot_ly(store_data, x=~Month, y=~Region, z=~TotalSales, type="bar3d")
```

22. Lollipop chart

```
ggplot(monthly_sales, aes(Month, TotalSales)) +
  geom_segment(aes(xend=Month, y=0, yend=TotalSales)) +
  geom_point(size=4)
```

23. Area chart

```
ggplot(monthly_sales, aes(Month, TotalSales)) + geom_area(fill="skyblue")
```

24. Violin: Customers by region

```
ggplot(store_data, aes(Region, NumberOfCustomers, fill=Region)) + geom_violin()
```

25. Correlation plot

```
cor_matrix <- store_data %>%
  select(TotalSales, NumberOfCustomers, AvgTransactionValue) %>% cor()
print(cor_matrix)
```

output: