INSTALLING PACKAGES

```
#installing packages
install.packages("httr")
install.packages("rvest")
if (!requireNamespace("e1071", quietly = TRUE)) {
  install.packages("e1071")
}
```

```
Installing package into ‘/usr/local/lib/R/site-lib
(as ‘lib’ is unspecified)

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also installing the dependency ‘proxy’
```

LOADING LIBRARIES

```
#loading libraries
library(httr)
library(rvest)
```

DATASET CREATION

```
# Creating an extended sample dataset for pizza sales
set.seed(123)  # for reproducibility

# Sample data with additional columns
pizza_data <- data.frame(
  day = seq(as.Date("2022-01-01"), as.Date("2022-01-1
  sales = c(20, 25, 18, 30, 22, 27, 24, 28, 21, 26),
  pizza = c("Margherita", "Pepperoni", "Vegetarian",
  pizza_size = c("Medium", "Large", "Small", "Large",
)
```

```
          day sales           pizza pizza_size
1  2022-01-01    20      Margherita     Medium
2  2022-01-02    25       Pepperoni      Large
3  2022-01-03    18      Vegetarian      Small
4  2022-01-04    30         Supreme      Large
5  2022-01-05    22        Hawaiian     Medium
6  2022-01-06    27     Meat Lovers      Large
7  2022-01-07    24          Cheese     Medium
8  2022-01-08    28  Veggie Delight      Large
9  2022-01-09    21     BBQ Chicken      Small
10 2022-01-10    26 Buffalo Chicken     Medium
```

```
pizza_data
```

A data.frame: 10 × 4

day	sales	pizza	pizza_size
<date>	<dbl>	<chr>	<chr>
2022-01-01	20	Margherita	Medium
2022-01-02	25	Pepperoni	Large
2022-01-03	18	Vegetarian	Small
2022-01-04	30	Supreme	Large
2022-01-05	22	Hawaiian	Medium
2022-01-06	27	Meat Lovers	Large
2022-01-07	24	Cheese	Medium

```
# Summary statistics for the data frame
summary(pizza_data)  # Equivalent to df.describe() in
```

```
      day                 sales          pizza
pizza_size
 Min.   :2022-01-01   Min.   :18.00   Length:10
Length:10
 1st Qu.:2022-01-03   1st Qu.:21.25   Class
:character   Class :character
```

SINGLE COLUMN STATISTICS

```
sales_stats <- summary(pizza_data$sales)
sales_stats
```

```
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max. 
  18.00   21.25   24.50   24.10   26.75   30.00 
```

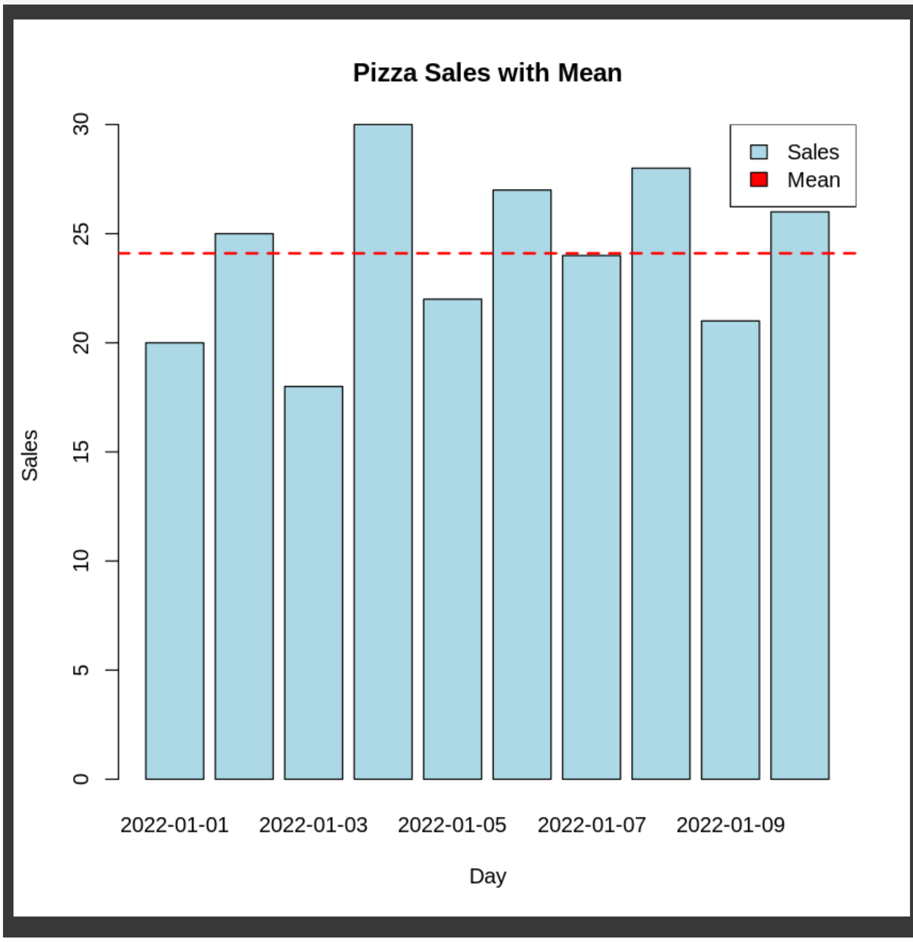
MEAN

```
mean_sales <- mean(pizza_data$sales)
mean_sales
```

```
24.1
```

mean_sales: The mean (average) of the sales values, indicating the central tendency of the data

```
# Create a bar plot
barplot(pizza_data$sales, names.arg = pizza_data$day,
abline(h = mean_sales, col = "red", lty = 2, lw = 2)
legend("topright", legend = c("Sales", "Mean"), fill
```



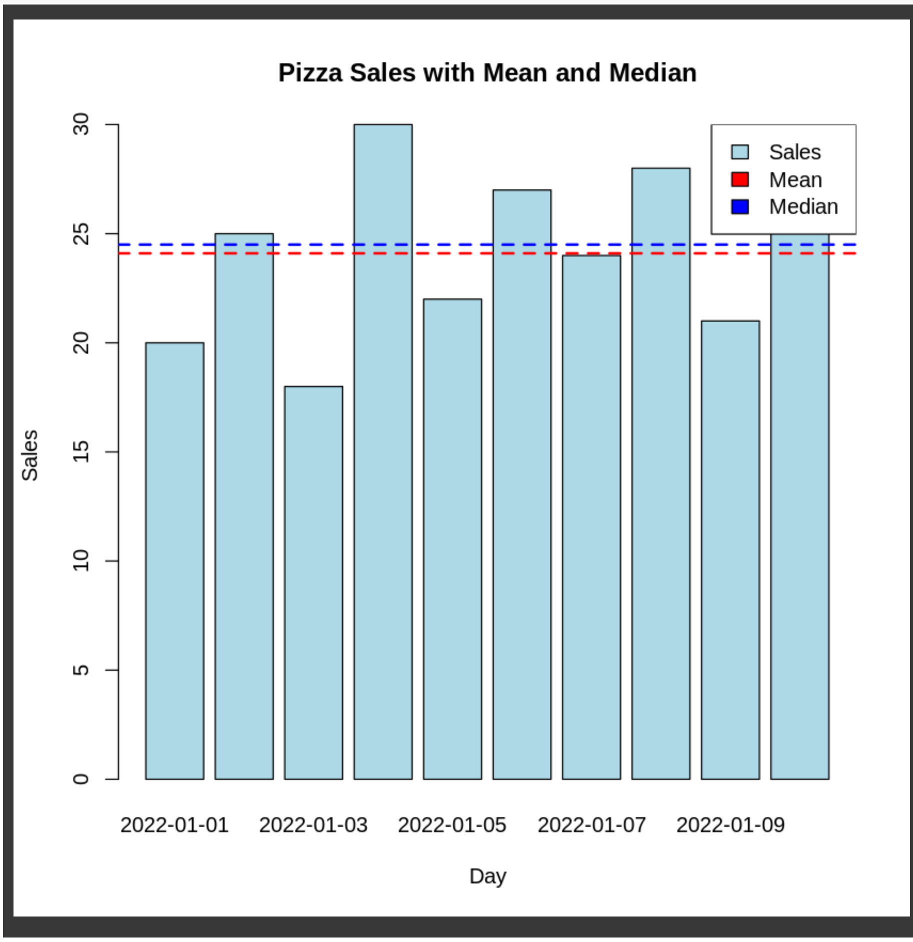
MEDIAN

```
median_sales <- median(pizza_data$sales)
median_sales
```

```
24.5
```

median_sales: The median, which is the middle value when the data is sorted, providing an alternative measure of central tendency.

```
# Create a bar plot with mean and median
barplot(pizza_data$sales, names.arg = pizza_data$day,
abline(h = mean_sales, col = "red", lty = 2, lw = 2)
abline(h = median_sales, col = "blue", lty = 2, lw = 
legend("topright", legend = c("Sales", "Mean", "Media
```



MODE

```
mode_sales <- as.numeric(names(table(pizza_data$sales
mode_sales
```

```
18
```

mode_sales: The mode, representing the most frequently occurring value in the sales data.

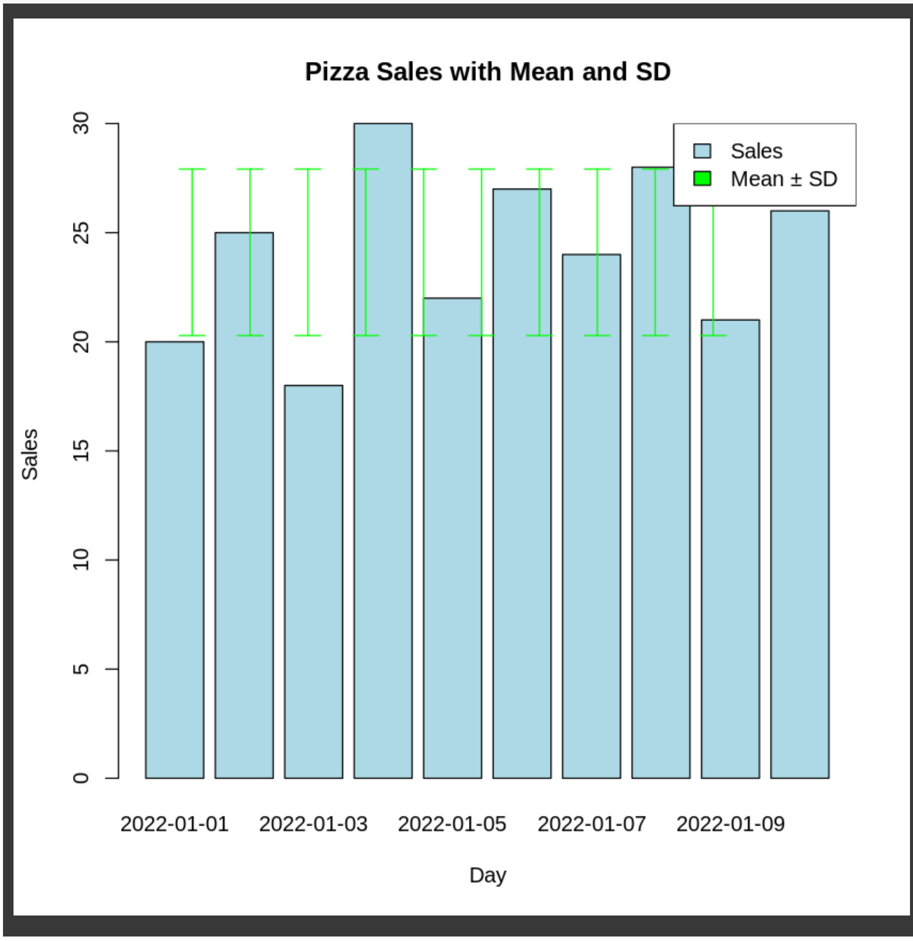
STANDARD DEVIATION

```
std_dev_sales <- sd(pizza_data$sales)
std_dev_sales
```

```
3.81371792932362
```

std_dev_sales: The standard deviation, a measure of the amount of variation or dispersion in the sales data.

```
# Create a bar plot with error bars
barplot(pizza_data$sales, names.arg = pizza_data$day,
arrows(seq_along(pizza_data$sales), mean_sales - std_
legend("topright", legend = c("Sales", "Mean ± SD"),
```



VARIANCE

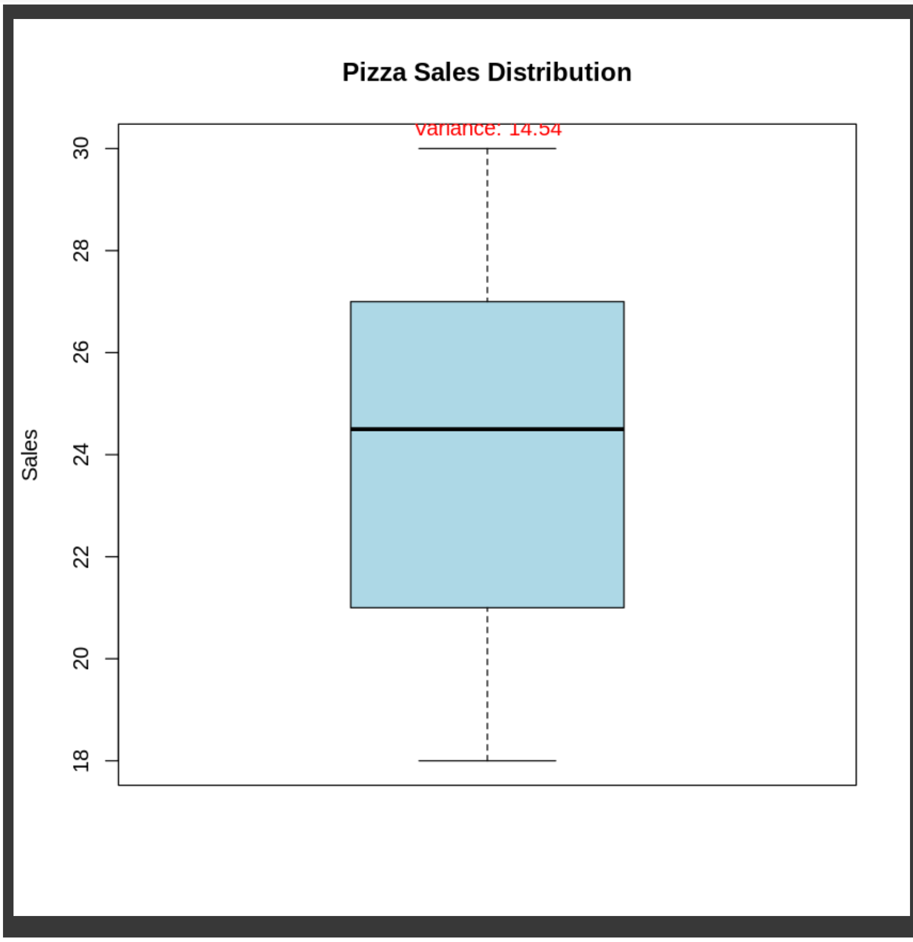
```
variance_sales <- var(pizza_data$sales)
variance_sales
```

```
14.5444444444444
```

variance_sales: The variance, which is the square of the standard deviation, providing another measure of data spread

```
# Create a box plot
boxplot(pizza_data$sales, main = "Pizza Sales Distrib

# Add text annotation for variance
text(1, max(pizza_data$sales), paste("Variance:", rou
```



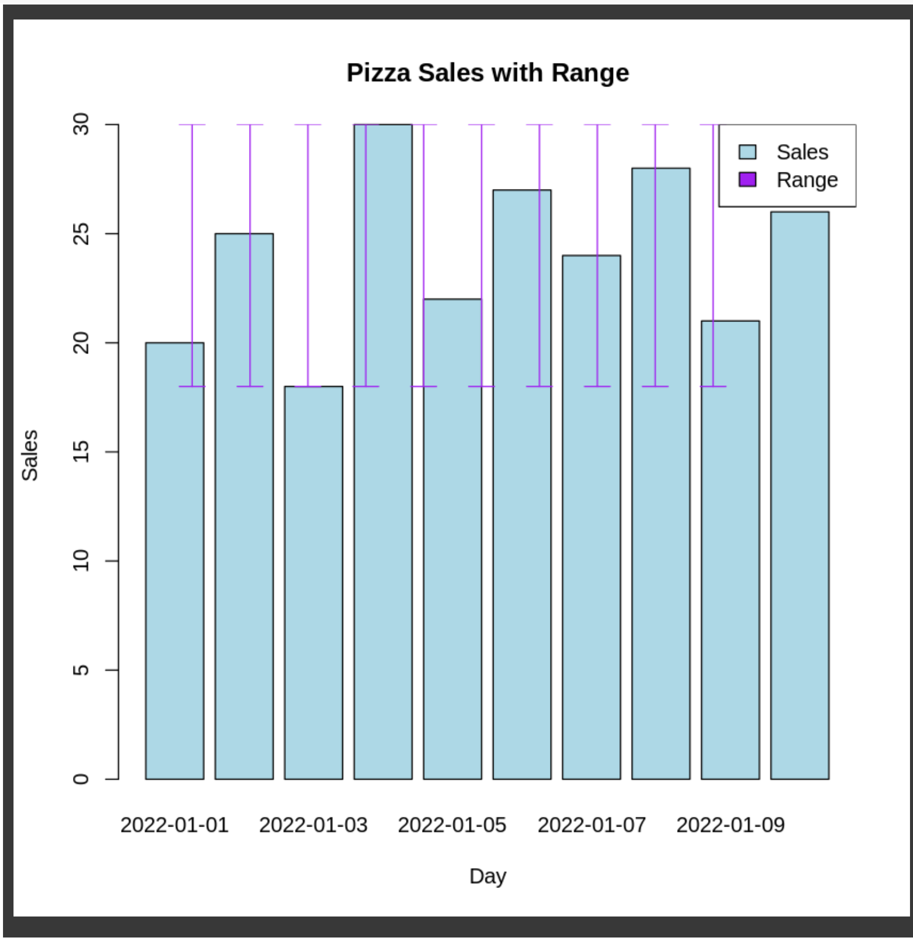
RANGE

```
range_sales <- range(pizza_data$sales)
range_sales
```

```
18 · 30
```

range_sales: The range, which is the difference between the maximum and minimum sales values.

```
# Create a bar plot with error bars
barplot(pizza_data$sales, names.arg = pizza_data$day,
arrows(seq_along(pizza_data$sales), range_sales[1], s
legend("topright", legend = c("Sales", "Range"), fill
```



QUARTILES

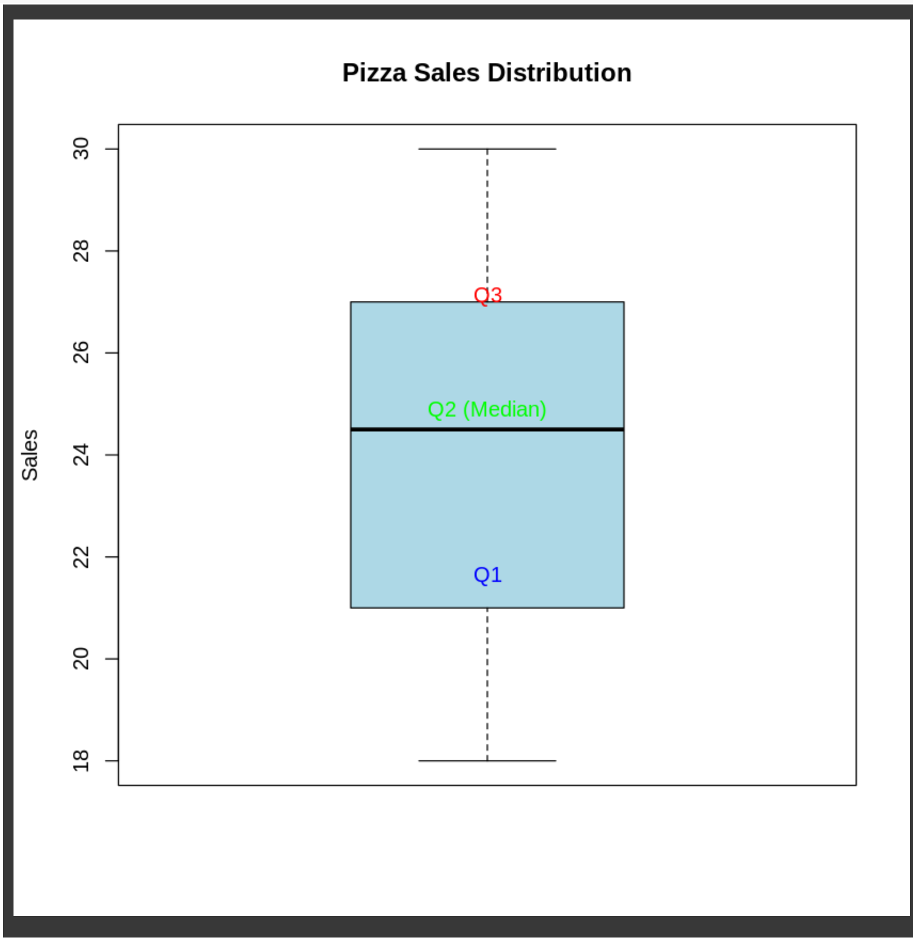
```
quartiles_sales <- quantile(pizza_data$sales, c(0.25,
quartiles_sales
```

```
25%:      21.25 50%:      24.5 75%:      26.75
```

sales_stats: A summary of basic statistics such as minimum, 1st quartile (Q1), median (2nd quartile or Q2), mean, 3rd quartile (Q3), and maximum.

```
# Create a box plot
boxplot(pizza_data$sales, main = "Pizza Sales Distrib

# Add text annotations for quartiles
text(1, quantile(pizza_data$sales, 0.75), "Q3", pos =
text(1, median(pizza_data$sales), "Q2 (Median)", pos =
text(1, quantile(pizza_data$sales, 0.25), "Q1", pos =
```



MIN

```
min_sales <- min(pizza_data$sales)
min_sales
```

```
18
```

min_sales: The minimum sales value in the dataset

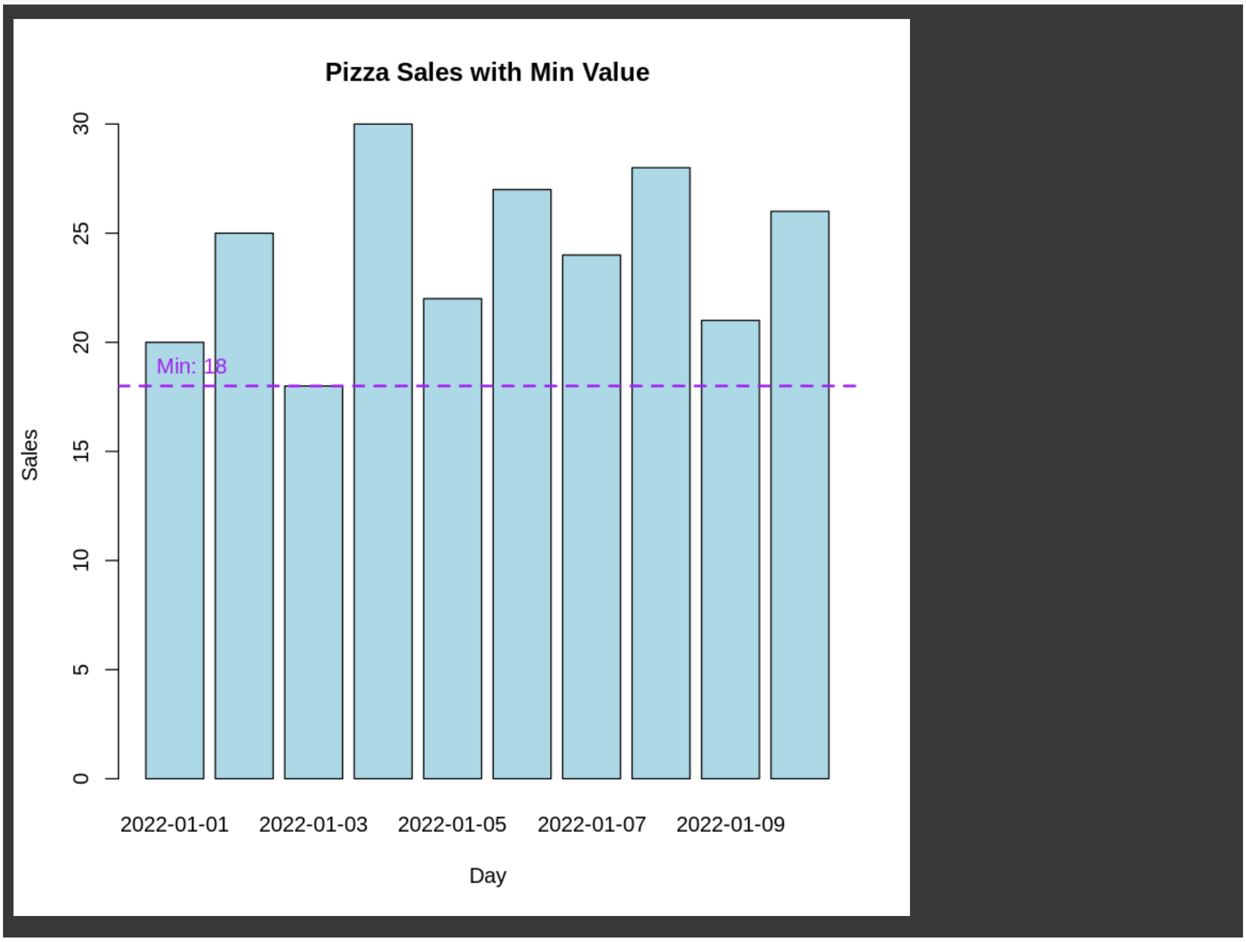
```
# Calculate the minimum sales
min_sales <- min(pizza_data$sales)

# Create a bar plot
barplot(pizza_data$sales, names.arg = pizza_data$day,

# Add a vertical line for the minimum value
abline(h = min_sales, col = "purple", lty = 2, lw = 2

# Add text annotation for the minimum value
text(1, min_sales, paste("Min:", min_sales), pos = 3,

# Show the plot
```



MAX

```
max_sales <- max(pizza_data$sales)
max_sales
```

```
30
```

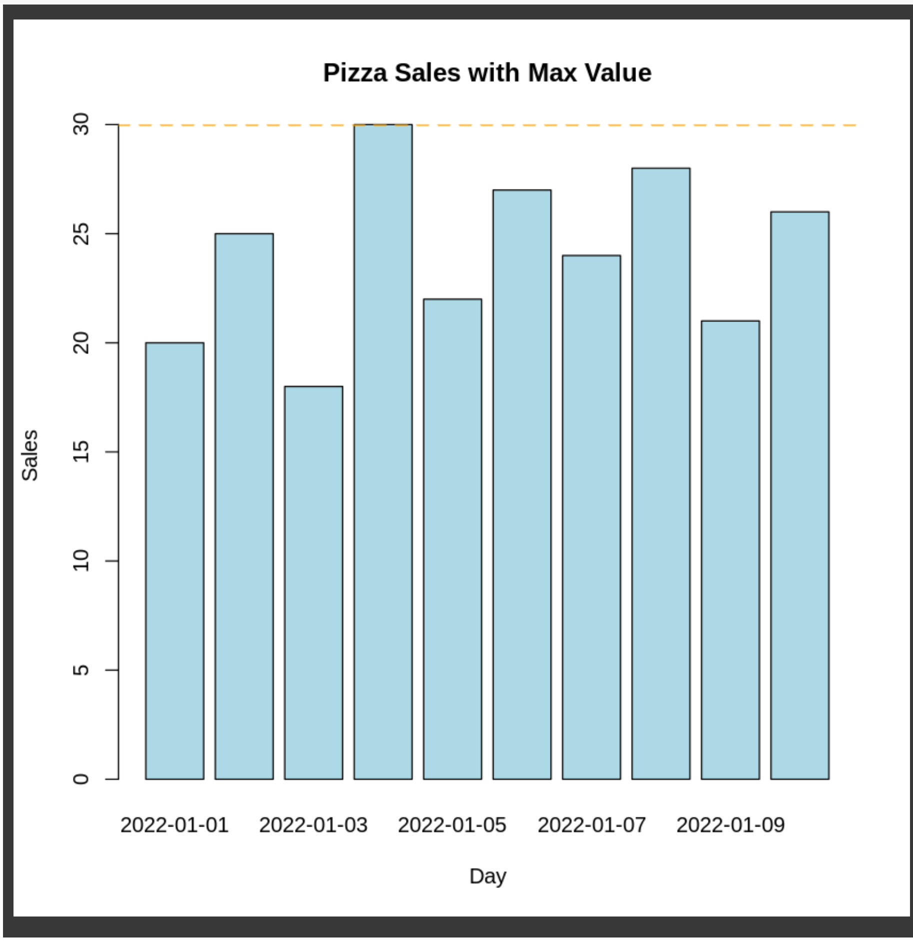
max_sales: The maximum sales value in the dataset

```
# Calculate the maximum sales
max_sales <- max(pizza_data$sales)

# Create a bar plot
barplot(pizza_data$sales, names.arg = pizza_data$day,

# Add a vertical line for the maximum value
abline(h = max_sales, col = "orange", lty = 2, lw = 2

# Add text annotation for the maximum value
text(1, max_sales, paste("Max:", max_sales), pos = 3,
```



COUNT

```
count_sales <- length(pizza_data$sales)
count_sales
```

```
10
```

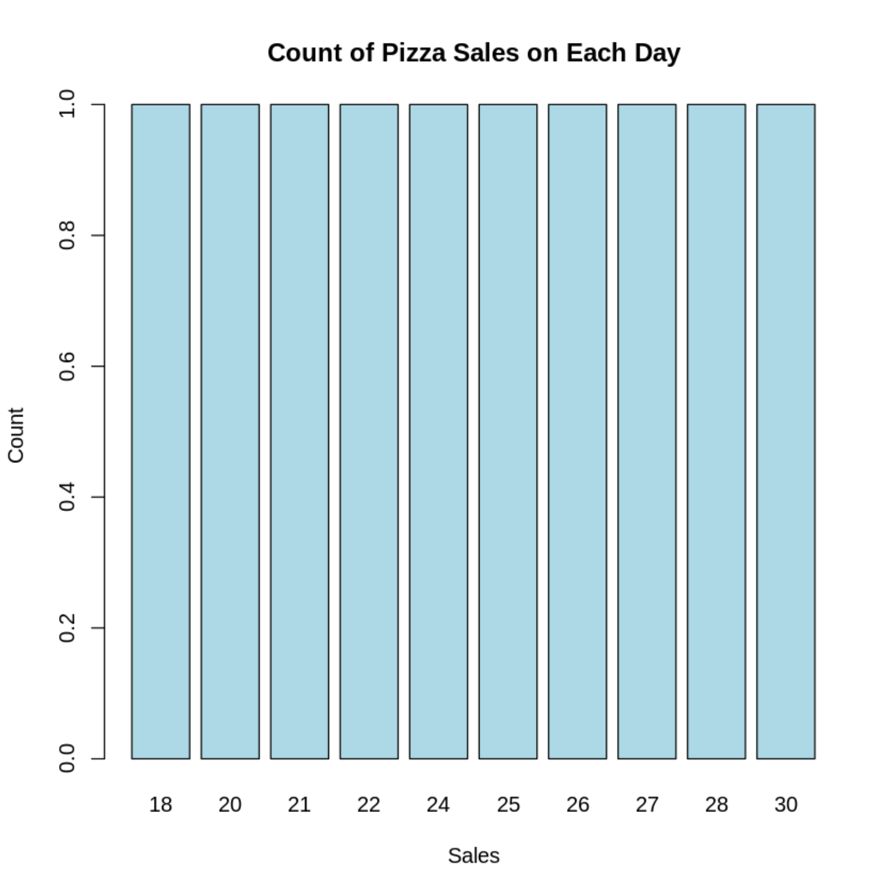
count_sales: The count or number of values in the 'sales' column.

```
# Calculate the count of sales on each day
count_sales <- table(pizza_data$sales)

# Create a bar plot
barplot(count_sales, main = "Count of Pizza Sales on

# Add text annotations for each bar
text(seq_along(count_sales), count_sales, labels = as

# Show the plot
```



SKEWNESS AND KURTOSIS

```
# Install and load the e1071 library
if (!requireNamespace("e1071", quietly = TRUE)) {
  install.packages("e1071")
}
library(e1071)

# Calculate skewness
skewness_sales <- skewness(pizza_data$sales)
cat("Skewness:", skewness_sales, "\n")

# Calculate kurtosis
kurtosis_sales <- kurtosis(pizza_data$sales)
cat("Kurtosis:", kurtosis_sales, "\n")
```

```
Skewness: -0.06901226
Kurtosis: -1.436965
```

skewness_sales: A measure of the asymmetry in the sales data distribution. Positive skewness indicates a right-skewed distribution, while negative skewness indicates a left-skewed distribution.

kurtosis_sales: A measure of the tails and sharpness of the peak of the sales data distribution. Positive kurtosis indicates heavy tails and a peaked distribution, while negative kurtosis suggests light tails and a flat distribution.

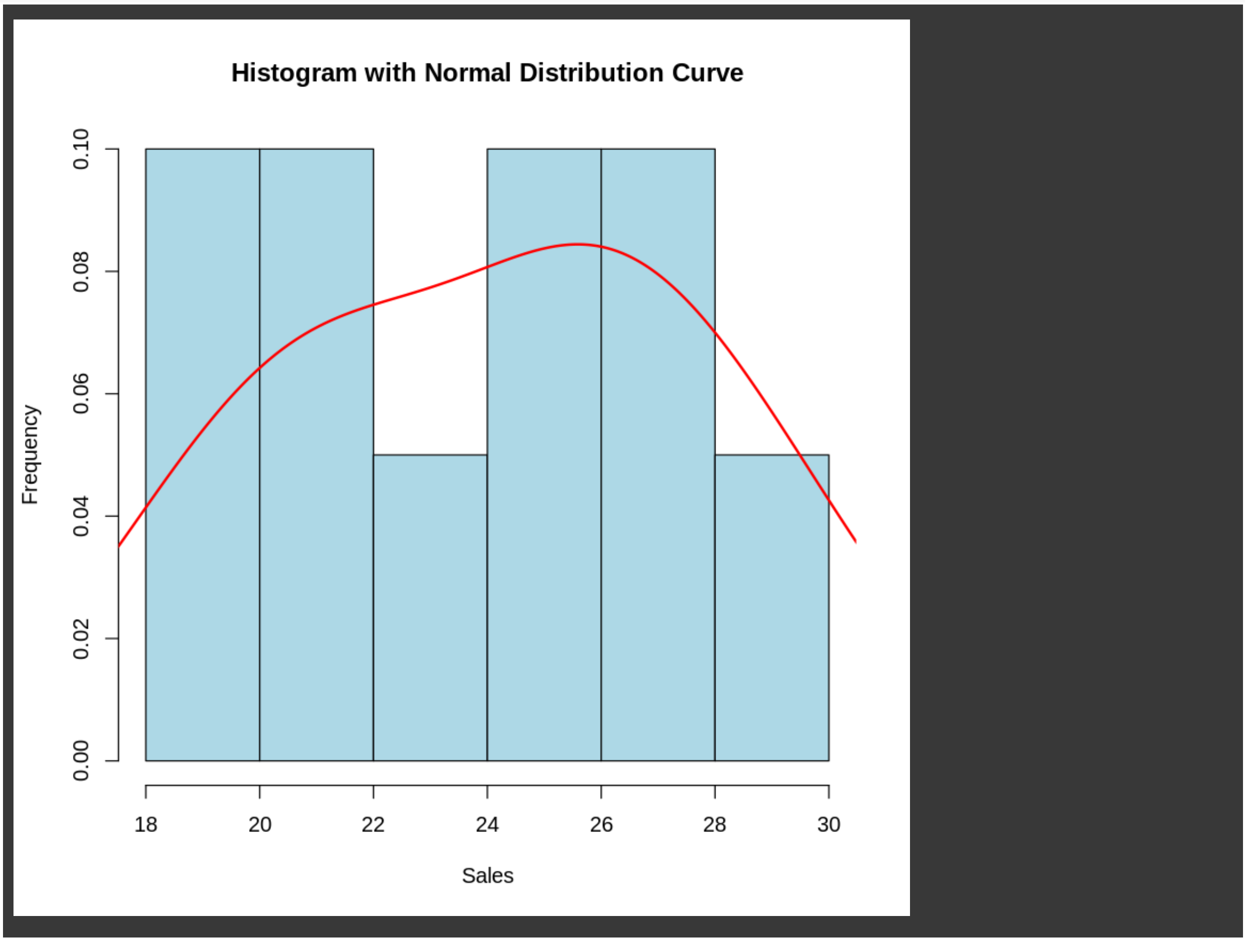
```
# Install and load required libraries
if (!requireNamespace("e1071", quietly = TRUE)) {
  install.packages("e1071")
}
library(e1071)
```

```
# Calculate skewness and kurtosis
skewness_sales <- skewness(pizza_data$sales)
kurtosis_sales <- kurtosis(pizza_data$sales)

# Create a histogram with a normal distribution curve
hist(pizza_data$sales, col = "lightblue", main = "His
lines(density(pizza_data$sales), col = "red", lwd = 2

# Add text annotations for skewness and kurtosis
text(35, 0.15, paste("Skewness:", round(skewness_sale
text(35, 0.12, paste("Kurtosis:", round(kurtosis_sale

# Show the plot
```


Histogram with Normal Distribution Curve
Frequency
Sales