Qno_06.R

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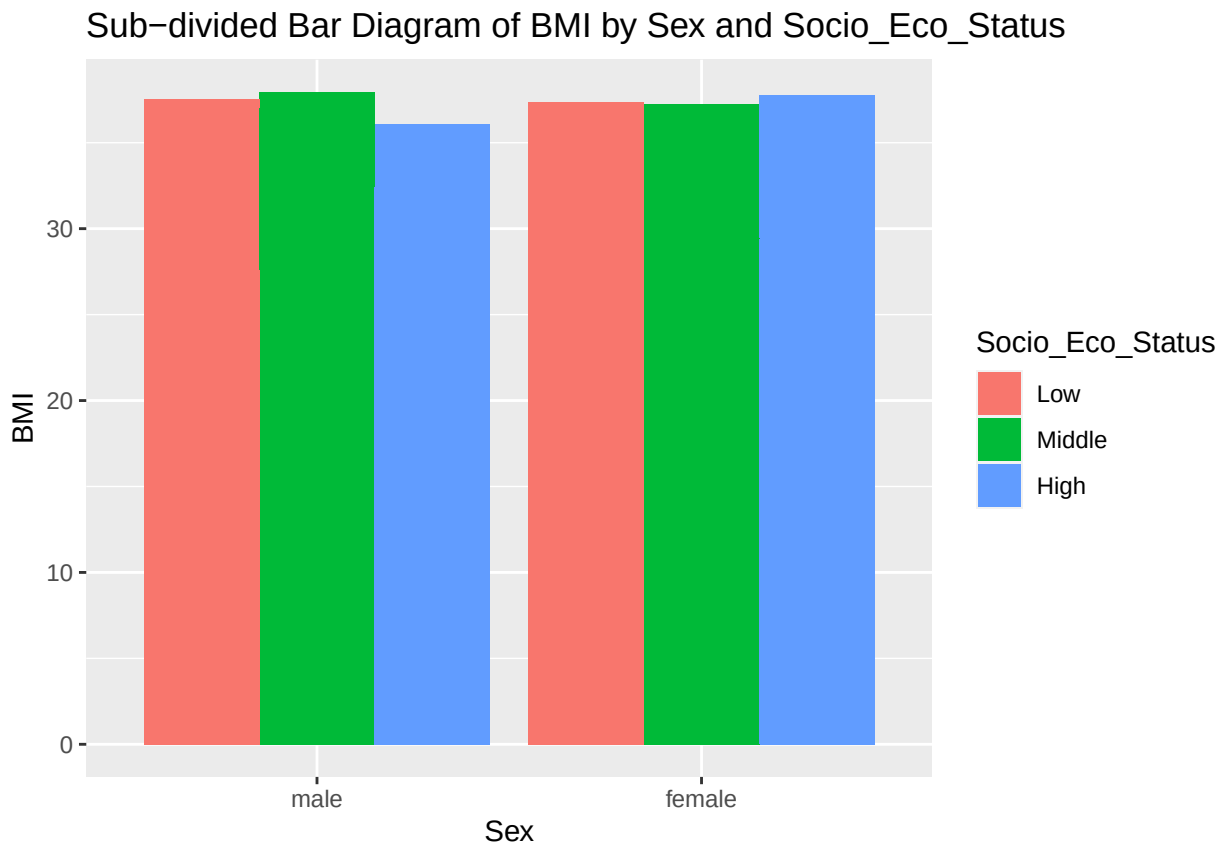
```
#a
set.seed(7916007)
Age <- sample(18:99, 150, replace = TRUE)
sex <- sample(c("male", "female"), 150, replace = TRUE)
education_levels <- sample(c("No_education", "Primary", "Secondary", "Beyond_Secondary"), 150, replace =
Socio_Eco_Status <- sample(c("Low", "Middle", "High"), 150, replace = TRUE)
BMI <- runif(150, min = 14, max = 38)

data <- data.frame(Age, sex, education_levels, Socio_Eco_Status, BMI)

# Convert to factors
data$sex <- factor(data$sex, levels = c("male", "female"))
data$education_levels <- factor(data$education_levels, levels = c("No_education", "Primary", "Secondary
data$Socio_Eco_Status <- factor(data$Socio_Eco_Status, levels = c("Low", "Middle", "High"))

head(data)
```

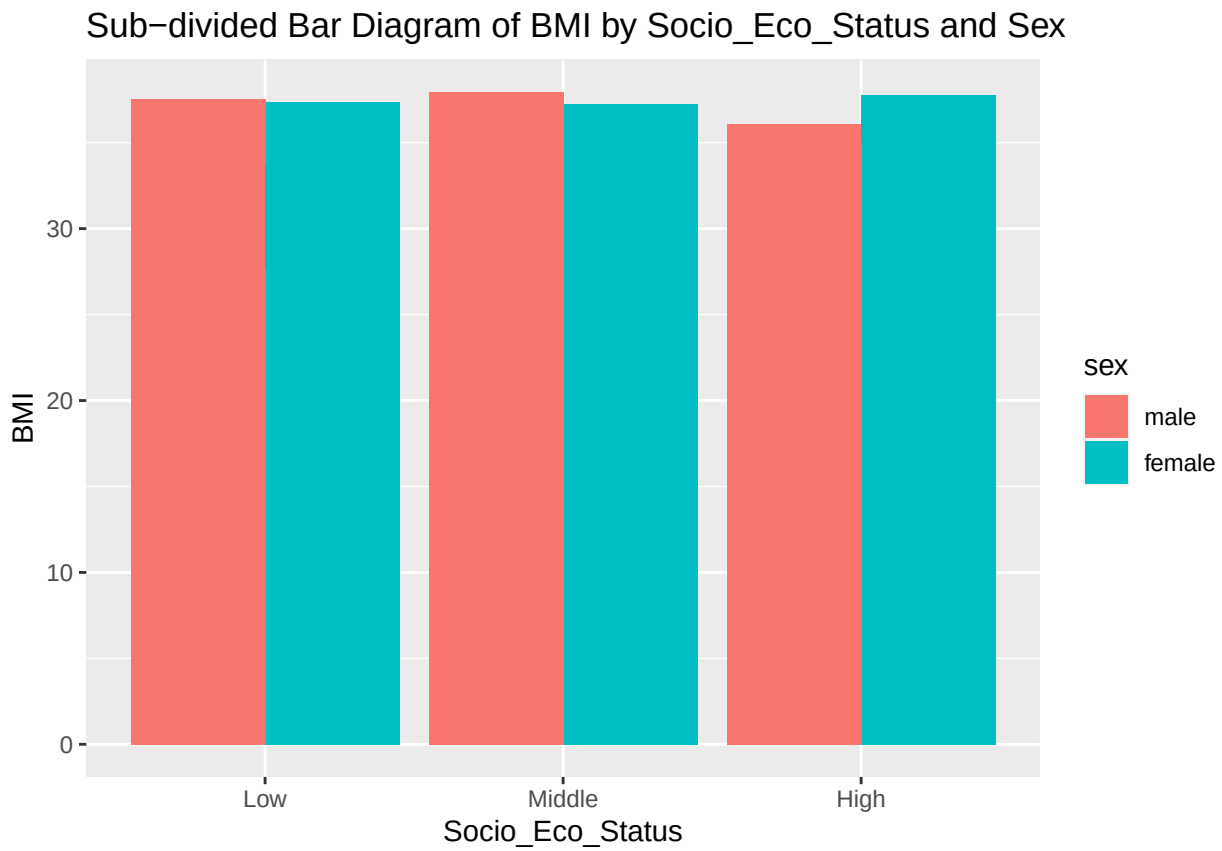
```
##   Age    sex education_levels Socio_Eco_Status      BMI
## 1  43   male          Primary           Middle 29.52366
## 2  73 female        Secondary             High 37.02683
## 3  84   male        Secondary             High 35.10696
## 4  26   male        Secondary             High 22.85961
## 5  82 female Beyond_Secondary             High 23.16224
## 6  59 female     No_education              Low 31.15698
```

```
library(ggplot2)

# b
# Sub-divided bar diagram of BMI by sex
ggplot(data, aes(x = sex, y = BMI, fill = Socio_Eco_Status)) +
  geom_bar(position = "dodge", stat = "identity") +
  labs(title = "Sub-divided Bar Diagram of BMI by Sex and Socio_Eco_Status",
       x = "Sex", y = "BMI")
```



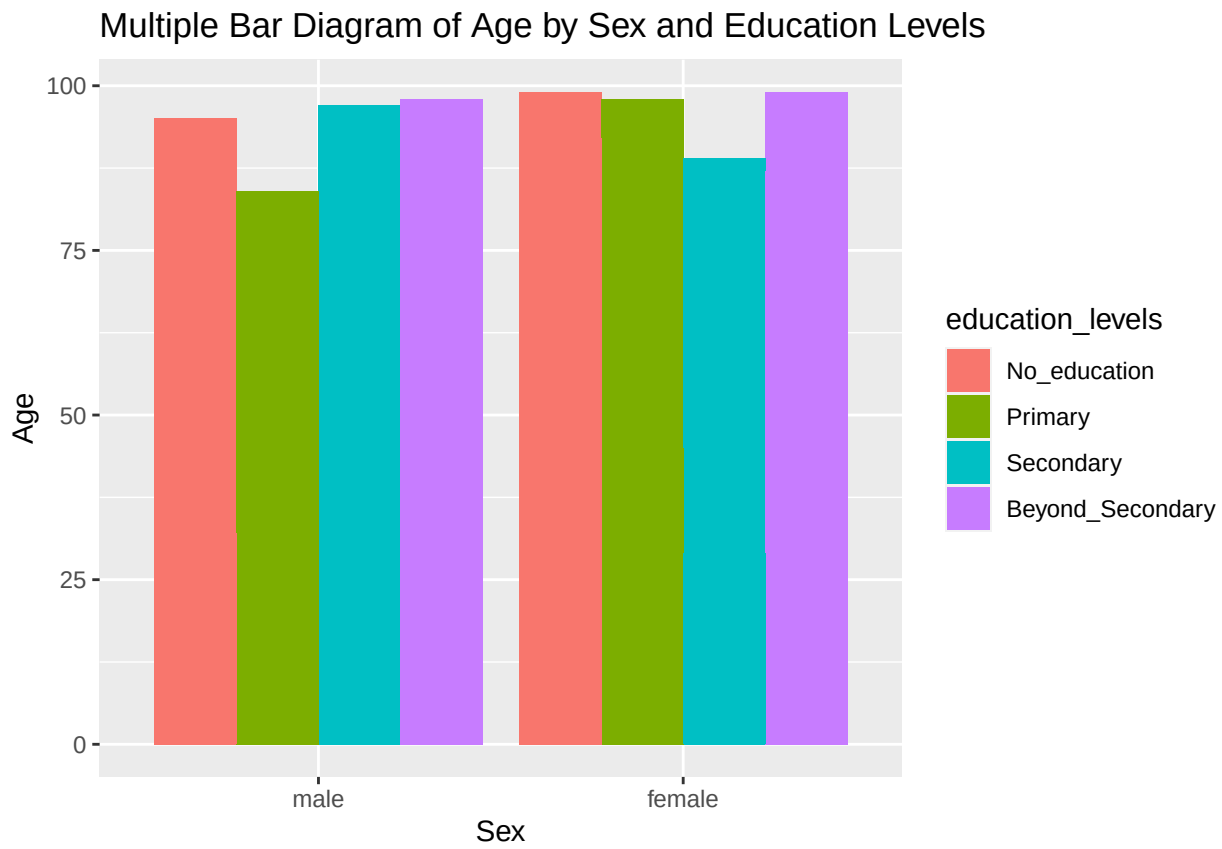
Interpretation: Sub-divided Bar Diagram of BMI by Sex and Socio_Eco_Status shows that we have two categories in x axis as male and female and BMI of 3 category people are shown and we get from the plat that Female with High socio economic status has BMI where as same category male has low BMI.

```
# Sub-divided bar diagram of BMI by Socio_Eco_Status
ggplot(data, aes(x = Socio_Eco_Status, y = BMI, fill = sex)) +
  geom_bar(position = "dodge", stat = "identity") +
  labs(title = "Sub-divided Bar Diagram of BMI by Socio_Eco_Status and Sex",
       x = "Socio_Eco_Status", y = "BMI")
```



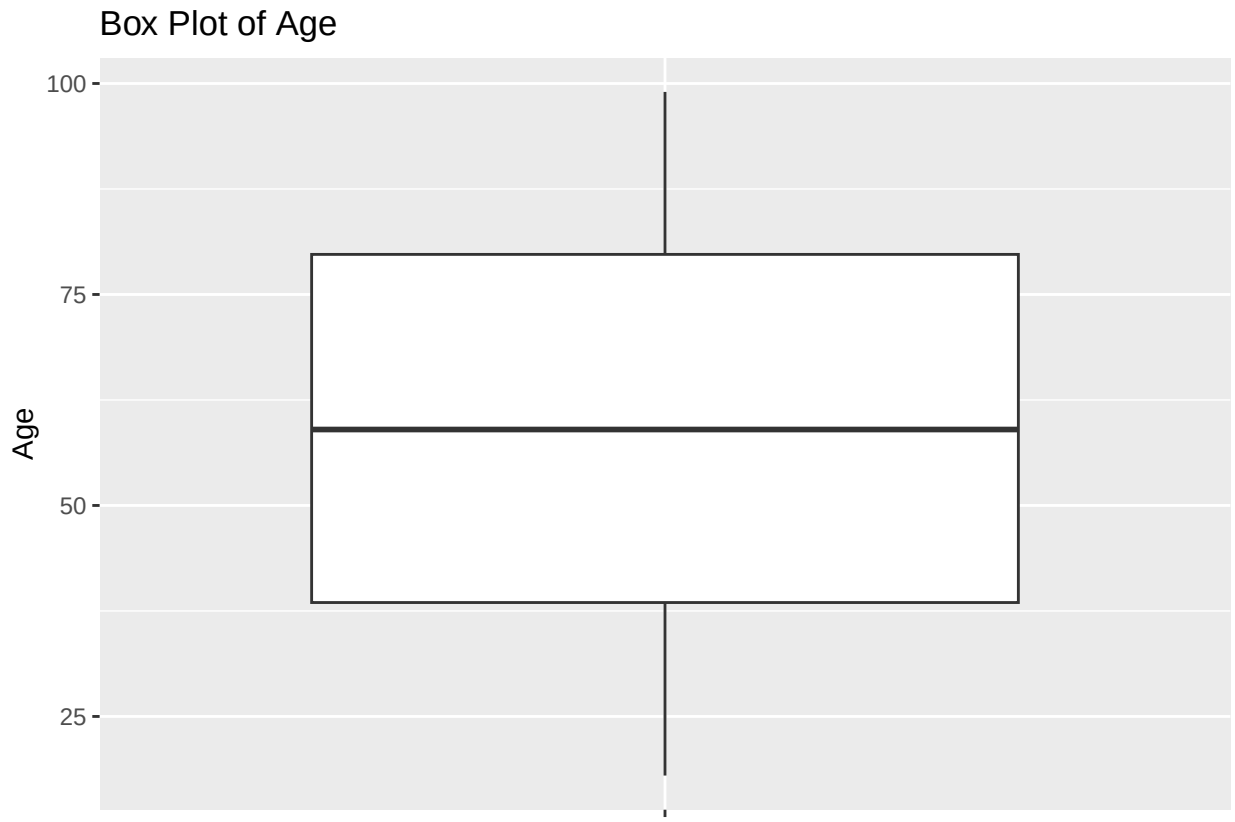
Interpretation: Sub-divided Bar Diagram of BMI by Socio_Eco_Status and Sex shows that we have two categories in x axis as male and female and BMI of 3 category people are shown and we get from the plat that Female with High socio economic status has BMI where as same category male has low BMI. As simillar to above plot.

```
# c

# Multiple bar diagram of age variable with sex and education_levels variables
ggplot(data, aes(x = sex, y = Age, fill = education_levels)) +
  geom_bar(position = "dodge", stat = "identity") +
  labs(title = "Multiple Bar Diagram of Age by Sex and Education Levels",
       x = "Sex", y = "Age")
```

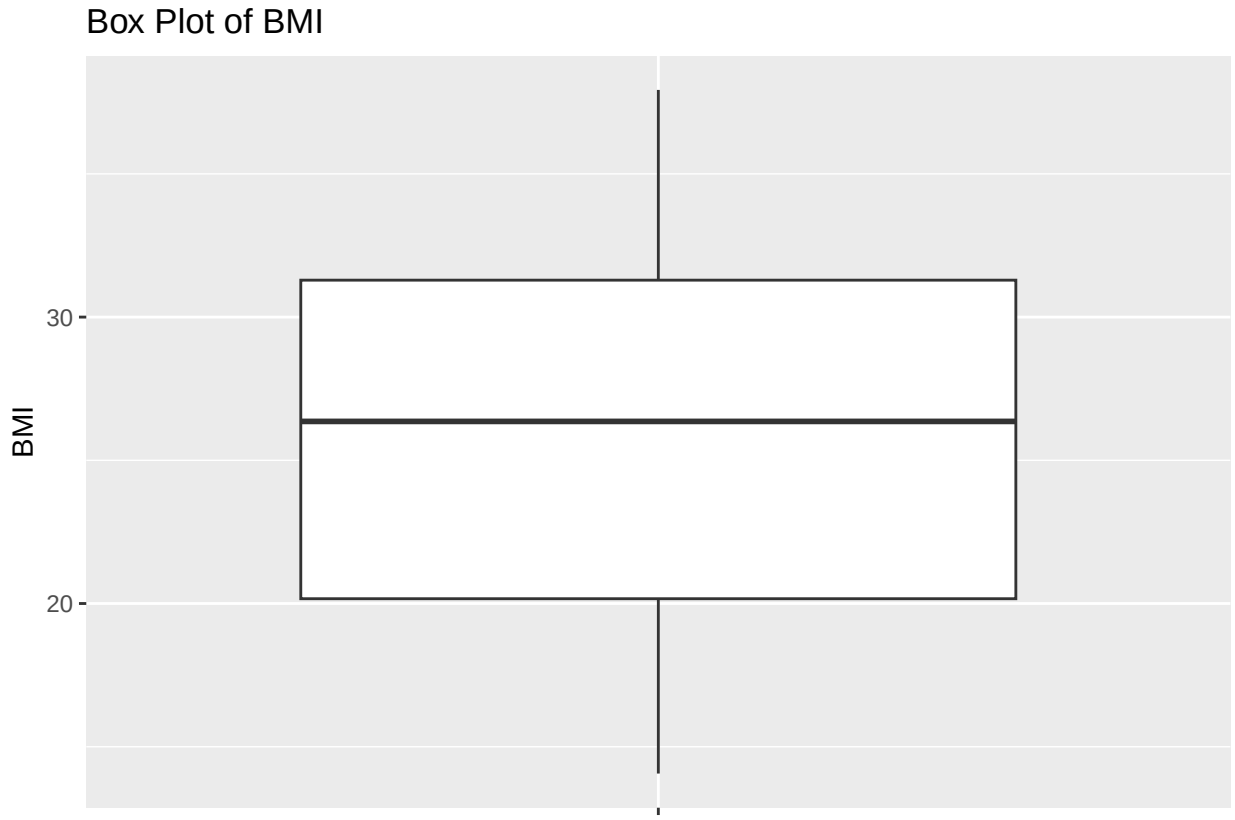


Interpretation: Here we get female with No-education and Primary education level has higer Age. Where as same but opposite for male.

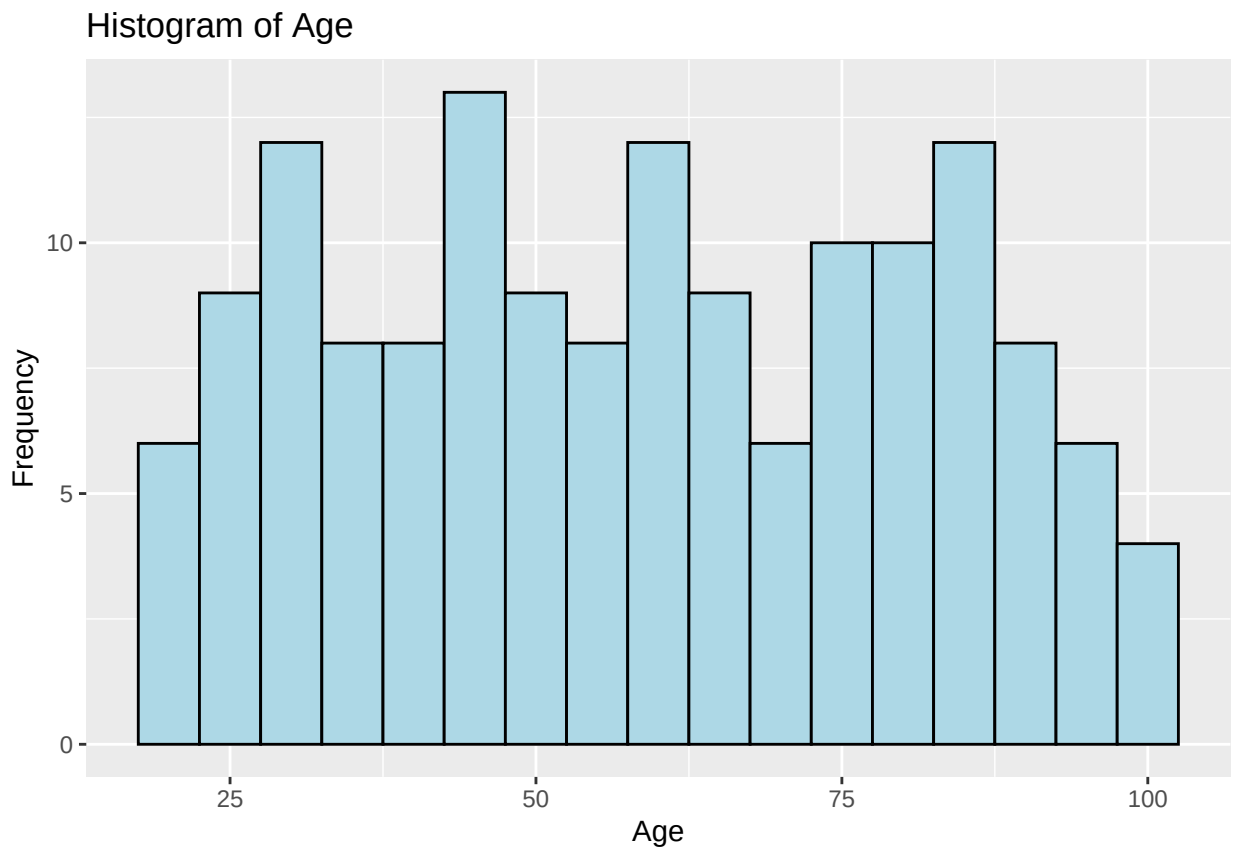
```
# d
# Box plot of age
ggplot(data, aes(x = "", y = Age)) +
  geom_boxplot() +
  labs(title = "Box Plot of Age", x = NULL, y = "Age")
```



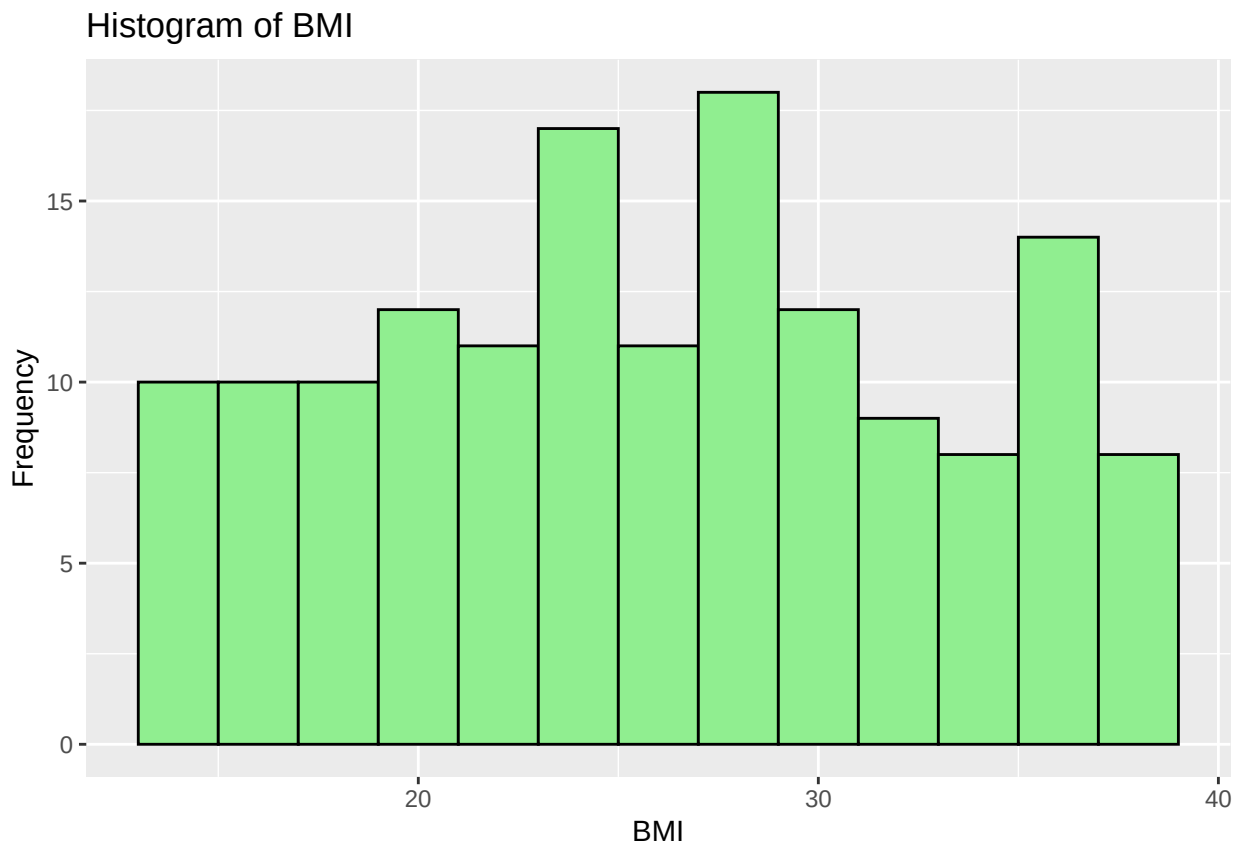

```
# Box Plot shows that for age the median is between 75 and 50 and Minimum value is 25 and max is almost

# Box plot of BMI
ggplot(data, aes(x = "", y = BMI)) +
  geom_boxplot() +
  labs(title = "Box Plot of BMI", x = NULL, y = "BMI")
```




```
# Box Plot shows that for BMI the median is between 30 and 20 and Minimum value is 15 and max is above
# Here the median BMI is almost 25.


# Histogram of age
ggplot(data, aes(x = Age)) +
  geom_histogram(binwidth = 5, fill = "lightblue", color = "black") +
  labs(title = "Histogram of Age", x = "Age", y = "Frequency")
```




```
# Histogram of Age shows the data of Age looks like a Normal which is not a
# Skewed distribution.

# Histogram of BMI
ggplot(data, aes(x = BMI)) +
  geom_histogram(binwidth = 2, fill = "lightgreen", color = "black") +
  labs(title = "Histogram of BMI", x = "BMI", y = "Frequency")
```




```
# Histogram of BMI shows the data of Age looks like a Normal which is not a
# Skewed distribution. We can use Mean value for further analysis.
```