HW5

20184448 조민기

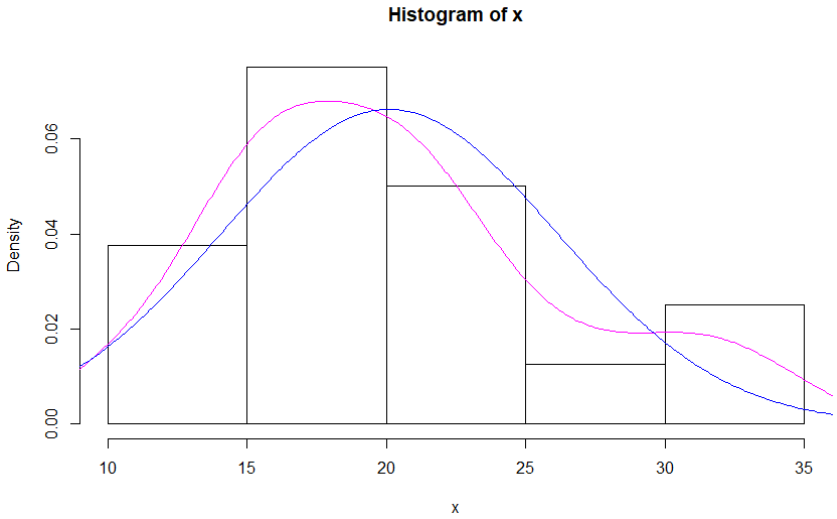
Prob 1

1)

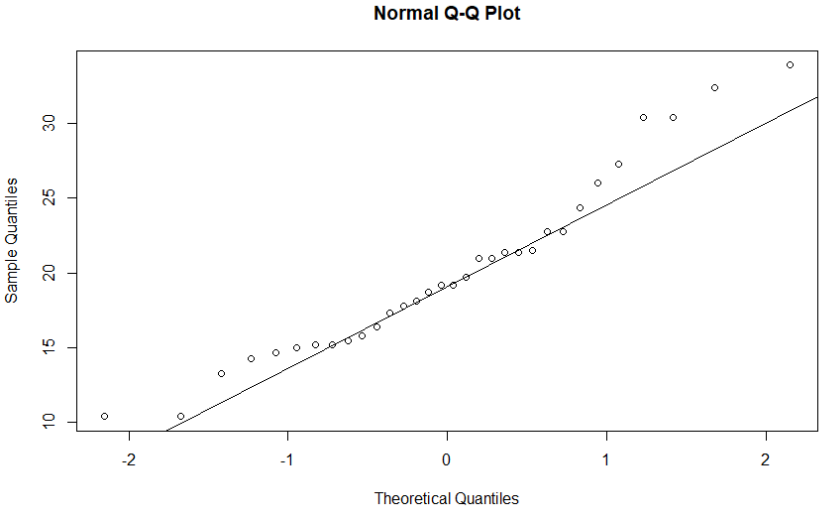
```
        Shapiro-Wilk normality test

data:  x
W = 0.94756, p-value = 0.1229
```

The result of the Shapiro-Wilk test. P-value is grater than 0.05 which means the null hypothesis that this data follow the normal distribution is rejected.



The blue line indicates the normal distribution $\mathrm{N}(\mu_x, \sigma_x)$ where x is the mpg data.
The violet line indicates the distribution of the x.



Result of the QQ norm.

According to the result, the distribution of the x does not follow the Gaussian distribution.

2)

```
data:  x1 and x2
t = -3.7671, df = 18.332, p-value = 0.001374
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -11.280194  -3.209684
sample estimates:
mean of x mean of y
 17.14737  24.39231
```

The mean of x1 is 17.14 and mean of y is 24.39 and the p value is smaller than 0.05. The true difference in means is not equal to 0.

Prob 2

```
> cat("Confidence intervals:", ci, " for x\n")
Confidence intervals: 4.358259 4.399123  for x
```

```
        One Sample t-test

data:  x
t = 420.09, df = 8087, p-value < 2.2e-16
alternative hypothesis: true mean is not equal to 0
95 percent confidence interval:
 4.358259 4.399123
sample estimates:
mean of x
 4.378691
```

The 95% confidence interval is [4.358259, 4.399123]