Is there a difference in hotel ratings between two different room classifications (Economy and Luxury)
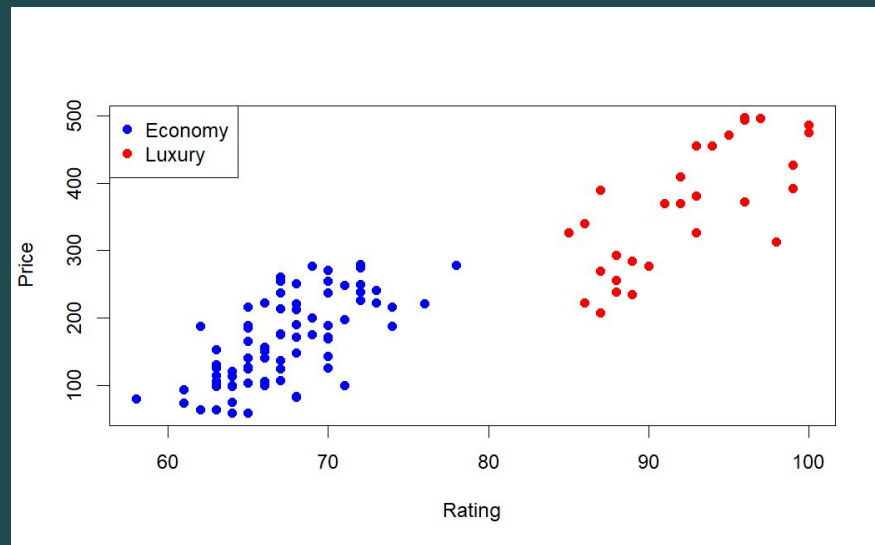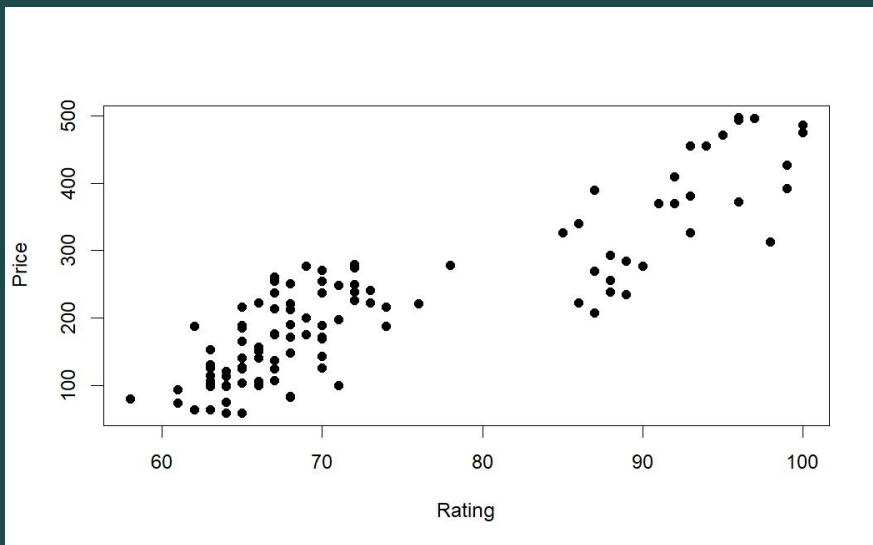
Hypothesis Testing

Hypothesis:
Is there a difference in hotel ratings between two different room classifications (Economy and Luxury)

Economy Line
$y=78.47+0.038(price)-17.48Z$
$Z = 1$ (Economy)
$Z = 0$ (Luxury/Baseline)

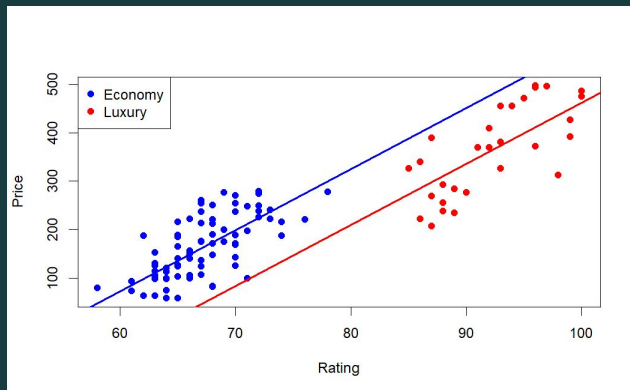**Luxury Line**
$y=60.99+0.038(price)+17.48Z$
$Z = 1$ (Luxury)
$Z = 0$ (Economy/Baseline)

Full Regression:
$y=\beta_0+\beta_1X_1+\beta_2Z$

Null Hypothesis
$Z = 0$

Alt Hypothesis
$Z \neq 0$

```
Call:
lm(formula = rating ~ price + Luxury, data = hotels)

Residuals:
    Min      1Q  Median      3Q     Max
-6.2191 -1.7405 -0.3445  1.6879  7.6935

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 60.986337   0.709975  85.899   <2e-16 ***
price        0.037826   0.003867   9.782   <2e-16 ***
Luxury      17.480761   0.998614  17.505   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.904 on 105 degrees of freedom
Multiple R-squared:  0.941,      Adjusted R-squared:  0.9399
F-statistic: 837.1 on 2 and 105 DF,  p-value: < 2.2e-16
```

```
Call:
lm(formula = rating ~ price + Economy, data = hotels)

Residuals:
    Min      1Q  Median      3Q     Max
-6.2191 -1.7405 -0.3445  1.6879  7.6935

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  78.467097   1.504604  52.151   <2e-16 ***
price         0.037826   0.003867   9.782   <2e-16 ***
Economy     -17.480761   0.998614 -17.505   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.904 on 105 degrees of freedom
Multiple R-squared:  0.941,      Adjusted R-squared:  0.9399
F-statistic: 837.1 on 2 and 105 DF,  p-value: < 2.2e-16
```

Conclusion: We reject our Null hypothesis as there is a significant difference between two room classifications when determining if the price of a hotel room affects it's rating

P Value: 2e-16
T Stat: 17.505