Econometrics-Damodar N. Gujarati Chapter 2/3

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$$\mathrm{Y}_i = \beta_0 + \beta_1 \mathrm{X}_i + u_i$$

$$y_i = \hat{\beta}_0 + \hat{\beta}_1 x_i + e_i$$

$$E[u \mid X] = 0$$

$$\hat{\mathrm{SE}}\left(\hat{\beta}_1\right) = \sqrt{\frac{s^2}{\sum_i \left(x_i - \overline{x}\right)^2}}$$

```
library(gujarati)
library(tidyverse)
library(broom)
lm(y ~ x, data = pop_df) %>% tidy()

view(Table3_3)

fix(Table3_3)
MODEL1 = lm(Table3_3$Cellphone ~ Table3_3$Pcapincome)

summary(MODEL1)
plot(Table3_3$Pcapincome, Table3_3$Cellphone,xlab = "Income",
     ylab = "CellPhone")

abline(MODEL1)
```

$Empirical Exercises$

3.20

```
fix(Table3_6)
par(mfrow=c(2,2))
plot(Table3_6$OUT_BUS, Table3_6$COM_BUS,xlab = "Output per Hour of All Persons",
     ylab = "Real Compensation per Hour",main = "Business")
plot(Table3_6$OUT_NBUS, Table3_6$COM_NBUS,xlab = "Output per Hour of All Persons",
     ylab = "Real Compensation per Hour",main = "Non-Farm",col="red")
```

$$Output = \hat{\beta}_0 + \hat{\beta}_1 Compensation + e_i$$

3.22

```
fix(Table3_7)
MODEL2 = lm(Table3_7$Gold.Price ~ Table3_7$CPI)

summary(MODEL2)


MODEL3 = lm(Table3_7$NYSE ~ Table3_7$CPI)

summary(MODEL3)
```

$$GoldPrice = \hat{\beta}_0 + \hat{\beta}_1 CPI + e_i$$

$$GoldPrice = \underset{(54.4685)}{215.2856} + \underset{(0.4038)}{1.0384} CPI$$

$$Consistency$$

$$\lim_{n \to \infty} P(|B_n - \alpha| > \epsilon) = 0 \tag{1}$$