Handout on Simple Linear Regression 2

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1. A sample of 10 billionaires is selected, and the person's age and net worth (in billions) are compared. The data are given here: X (age): 56, 39, 42, 60, 84, 37, 68, 66, 73, 55 & Y (net worth in Billions USD): 18, 14, 12, 14, 11, 10, 10, 7, 7, 5

1. (a & b) Find $\widehat{y}$ for each x & find a residual for each x.

```
x = c(56, 39, 42, 60, 84, 37, 68, 66, 73, 55)
y = c(18, 14, 12, 14, 11, 10, 10, 7, 7, 5)

df = data.frame(x , y)

model = lm(y~x, data = df)

data.frame(df, y_hat = fitted(model), e = residuals(model))
```

```
##     x  y     y_hat          e
## 1  56 18 10.934579  7.0654206
## 2  39 14 12.078505  1.9214953
## 3  42 12 11.876636  0.1233645
## 4  60 14 10.665421  3.3345794
## 5  84 11  9.050467  1.9495327
## 6  37 10 12.213084 -2.2130841
## 7  68 10 10.127103 -0.1271028
## 8  66  7 10.261682 -3.2616822
## 9  73  7  9.790654 -2.7906542
## 10 55  5 11.001869 -6.0018692
```

1. (c) Calculate the sum of squares total (SST).