Modeling

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$$R^2 = 1 - \frac{\sum_i (y_i - \hat{y}_i)^2}{\sum_i (y_i - \bar{y}_i)^2}$$

OLS Regression Results

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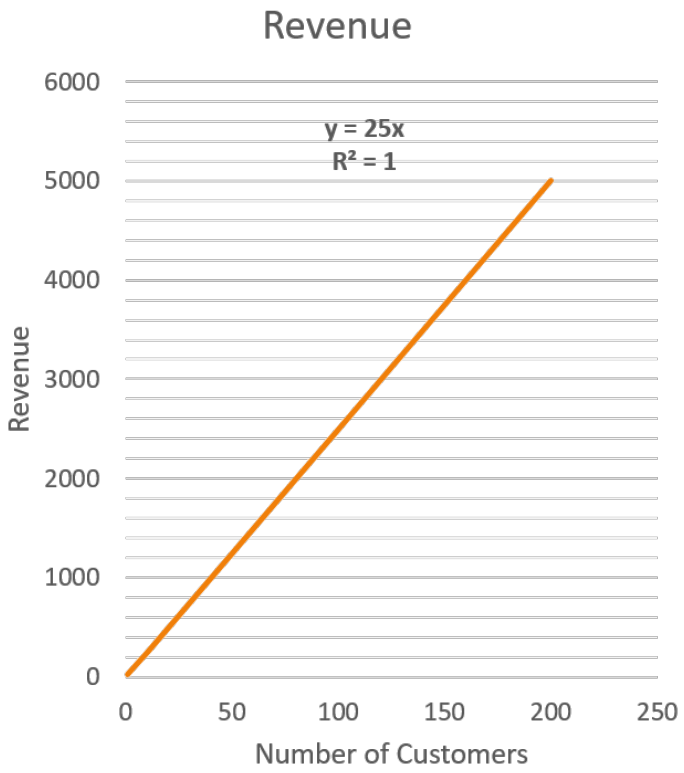
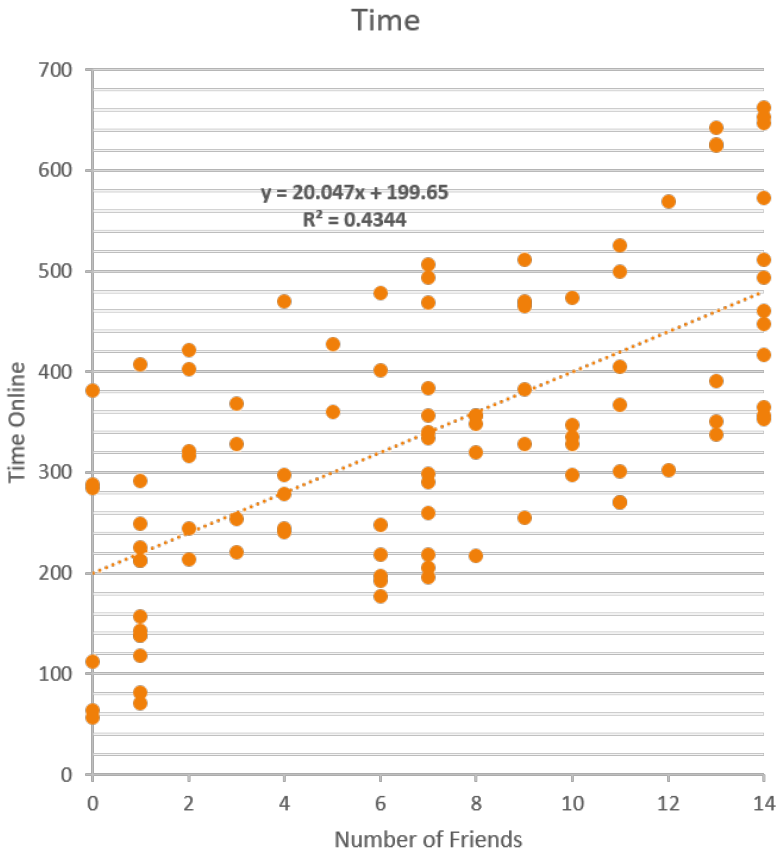
Dep. Variable:	attend	R-squared:	0.639
Model:	OLS	Adj. R-squared:	0.530
Method:	Least Squares	F-statistic:	5.864
Date:		Prob (F-statistic):	4.70e-06
Time:		Log-Likelihood:	-566.87
No. Observations:	57	AIC:	1162.
Df Residuals:	43	BIC:	1190.
Df Model:	13		
Covariance Type:	nonrobust		

R-Squared





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P-Values

- Low p-value?
  - Highly unlikely to occur randomly, therefore significant
- High p-value?
  - Coefficient might actually be zero, therefore consider removing from model

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lm(formula = hardness ~ dens, data = hardness)

Residuals:
Min      1Q  Median      3Q     Max
-338.40  -96.98  -15.71   92.71  625.06

Coefficients:
Estimate Std. Error t value Pr(>|t|)
(Intercept) -1160.500    108.580  -10.69 2.07e-12 ***
dens           57.507      2.279   25.24  < 2e-16 ***
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 183.1 on 34 degrees of freedom
Multiple R-squared:  0.9493,
Adjusted R-squared:  0.9478
F-statistic:   637 on 1 and 34 DF,  p-value: < 2.2e-16
```

Model Validation

Collect	Compare	Split
Collect new data	Compare the results with: • Theoretical expectation (how much should a 0-bedroom house cost?) • Earlier empirical studies • Simulation (see Chapter 9 examples from text)	Split the original data with one portion for training and one for testing