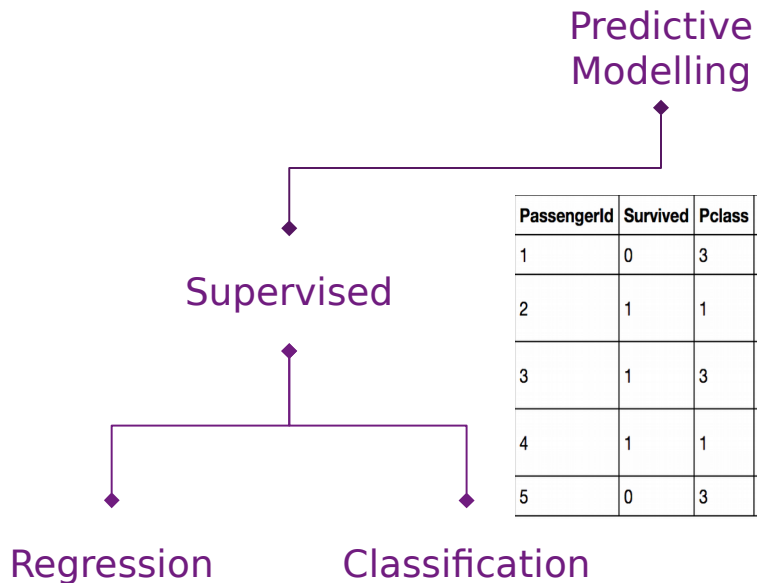


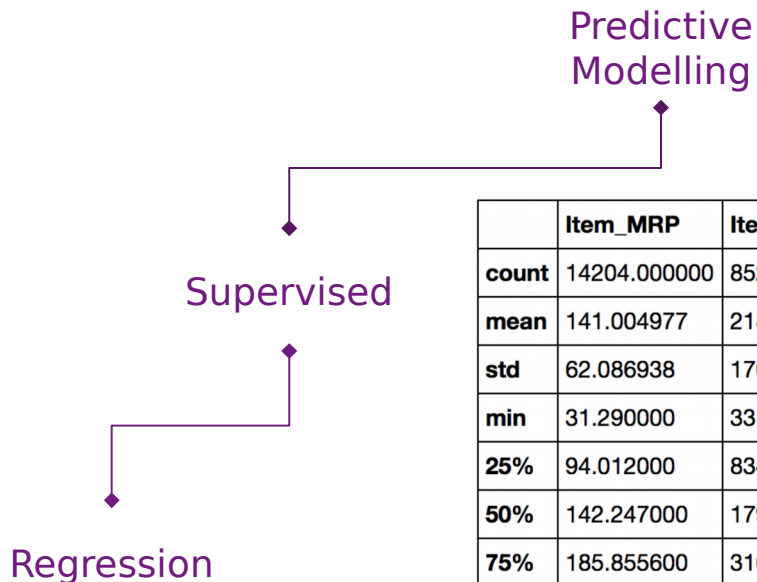
Evaluation Metrics: Regression

Evaluation Metrics : Overview



| PassengerId | Survived | Pclass | Name | Sex | Age | SibSp | Parch | Ticket | Fare | Cabin | Embarked |
|-------------|----------|--------|---|--------|------|-------|-------|------------------|---------|-------|----------|
| 1 | 0 | 3 | Braund, Mr. Owen Harris | male | 22.0 | 1 | 0 | A/5 21171 | 7.2500 | NaN | S |
| 2 | 1 | 1 | Cumings, Mrs. John Bradley (Florence Briggs Th... | female | 38.0 | 1 | 0 | PC 17599 | 71.2833 | C85 | C |
| 3 | 1 | 3 | Heikkinen, Miss. Laina | female | 26.0 | 0 | 0 | STON/O2. 3101282 | 7.9250 | NaN | S |
| 4 | 1 | 1 | Futrelle, Mrs. Jacques Heath (Lily May Peel) | female | 35.0 | 1 | 0 | 113803 | 53.1000 | C123 | S |
| 5 | 0 | 3 | Allen, Mr. William Henry | male | 35.0 | 0 | 0 | 373450 | 8.0500 | NaN | S |

Evaluation Metrics : Overview



| | Item_MRP | Item_Outlet_Sales | Item_Visibility | Item_Weight | Outlet_Establishment_Year |
|--------------|--------------|-------------------|-----------------|--------------|---------------------------|
| count | 14204.000000 | 8523.000000 | 14204.000000 | 11765.000000 | 14204.000000 |
| mean | 141.004977 | 2181.288914 | 0.065953 | 12.792854 | 1997.830681 |
| std | 62.086938 | 1706.499616 | 0.051459 | 4.652502 | 8.371664 |
| min | 31.290000 | 33.290000 | 0.000000 | 4.555000 | 1985.000000 |
| 25% | 94.012000 | 834.247400 | 0.027036 | 8.710000 | 1987.000000 |
| 50% | 142.247000 | 1794.331000 | 0.054021 | 12.600000 | 1999.000000 |
| 75% | 185.855600 | 3101.296400 | 0.094037 | 16.750000 | 2004.000000 |
| max | 266.888400 | 13086.964800 | 0.328391 | 21.350000 | 2009.000000 |

Evaluation Metrics : Regression

Evaluation Metrics : Regression

- Mean Absolute Error

Evaluation Metrics : Regression

- Mean Absolute Error
- Mean Squared Error

Evaluation Metrics : Regression

- Mean Absolute Error
- Mean Squared Error
- Root Mean Squared Error

Evaluation Metrics : Regression

- Mean Absolute Error
- Mean Squared Error
- Root Mean Squared Error
- Root Mean Squared Log Error

Evaluation Metrics : Regression

- Mean Absolute Error
- Mean Squared Error
- Root Mean Squared Error
- Root Mean Squared Log Error
- R-squared

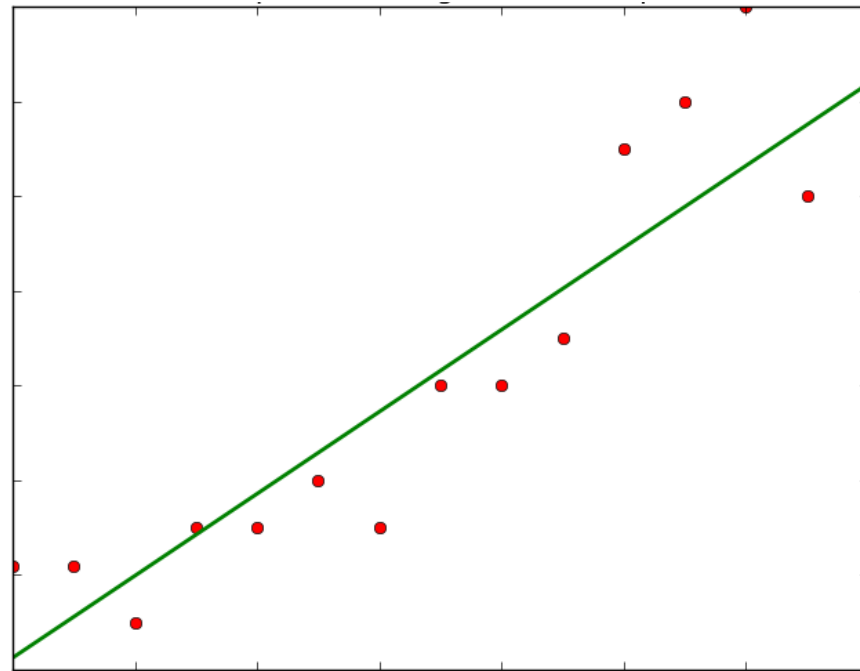
Evaluation Metrics : Regression

- Mean Absolute Error
- Mean Squared Error
- Root Mean Squared Error
- Root Mean Squared Log Error
- R-squared
- Adjusted R-squared

Evaluation Metrics : Regression

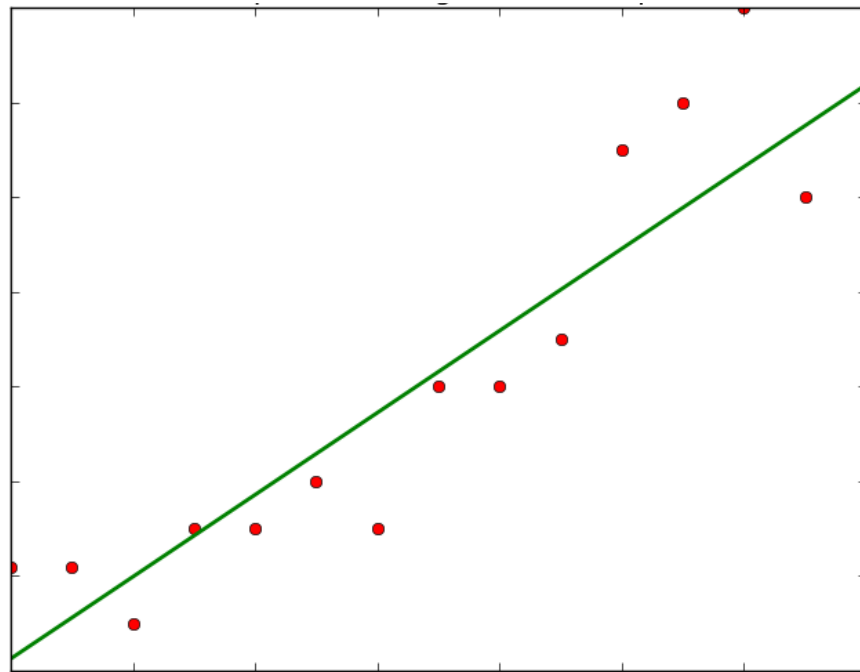
- Mean Absolute Error
- Mean Squared Error
- Root Mean Squared Error
- Root Mean Squared Log Error
- R-squared
- Adjusted R-squared

What is Error?



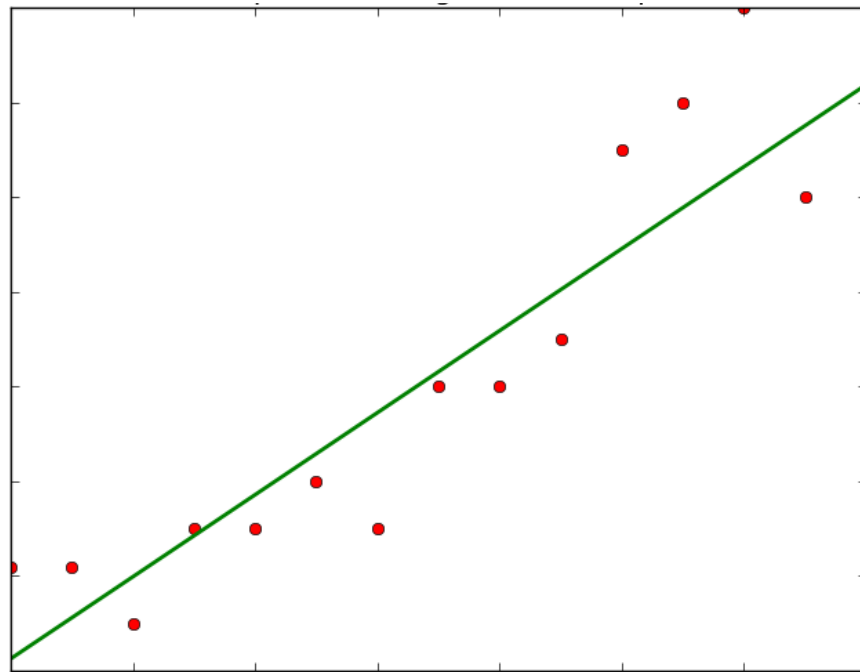
What is Error?

| Actual Values | Predicted Values |
|---------------|------------------|
| 19 | 28 |
| 37 | 33 |
| 25 | 20 |
| 9 | 16 |
| 22 | 15 |



What is Error?

| Actual Values | Predicted Values | Error |
|---------------|------------------|-------|
| 19 | 28 | 9 |
| 37 | 33 | -4 |
| 25 | 20 | -5 |
| 9 | 16 | 7 |
| 22 | 15 | -7 |



Mean Absolute Error

$$\text{MAE} = \frac{1}{N} \sum_{i=1}^N |y_i - \hat{y}_i|$$

Mean Absolute Error

$$\text{MAE} = \frac{1}{N} \sum_{i=1}^N |y_i - \hat{y}_i|$$

| Actual Values | Predicted Values | Absolute Error |
|---------------|------------------|----------------|
| 19 | 28 | 9 |
| 37 | 33 | 4 |
| 25 | 20 | 5 |
| 9 | 16 | 7 |
| 22 | 15 | 7 |

MAE = 6.4

Mean Squared Error

$$\text{MSE} = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y}_i)^2$$

Mean Squared Error

$$\text{MSE} = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y}_i)^2$$

$$\text{MSE} = 44 \text{ meter}^2$$

| Actual Values | Predicted Values | Squared Error |
|---------------|------------------|---------------|
| 19 | 28 | 81 |
| 37 | 33 | 16 |
| 25 | 20 | 25 |
| 9 | 16 | 49 |
| 22 | 15 | 49 |

Mean Squared Error

$$\text{MSE} = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y}_i)^2$$

Root Mean Squared Error

$$\text{MSE} = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y}_i)^2$$

$$\text{RMSE} = \sqrt{\frac{\sum_{i=1}^N (\text{Predicted}_i - \text{Actual}_i)^2}{N}}$$

Root Mean Squared Error

$$RMSE = \sqrt{\frac{\sum_{i=1}^N (Predicted_i - Actual_i)^2}{N}}$$

| Actual Values | Predicted Values | Squared Error |
|---------------|------------------|---------------|
| 19 | 28 | 81 |
| 37 | 33 | 16 |
| 25 | 20 | 25 |
| 9 | 16 | 49 |
| 22 | 15 | 49 |

$$MSE = 44 \text{ meter}^2$$

$$RMSE = 6.63 \text{ meters}$$

Root Mean Squared Error

| Actual | Predicted |
|--------|-----------|
| 1 | 401 |

| Actual | Predicted |
|--------|-----------|
| 10,001 | 10,401 |

Root Mean Squared Error

| Actual | Predicted |
|--------|-----------|
| 1 | 401 |

$$\text{RMSE} = 400$$

| Actual | Predicted |
|--------|-----------|
| 10,001 | 10,401 |

$$\text{RMSE} = 400$$

Root Mean Squared Log Error

$$RMSE = \sqrt{\frac{\sum_{i=1}^N (Predicted_i - Actual_i)^2}{N}}$$

$$RMSLE = \sqrt{\frac{1}{N} \sum_{i=1}^N \left(\log(Y_i + 1) - \log(\hat{Y}_i + 1) \right)^2}$$

Root Mean Squared Log Error

| Actual | Predicted |
|--------|-----------|
| 1 | 401 |

$$\text{RMSE} = 400$$

$$\text{RMSLE} = 5.3$$

| Actual | Predicted |
|--------|-----------|
| 10,000 | 10,401 |

$$\text{RMSE} = 400$$

$$\text{RMSLE} = 0.039$$