# FINAL DATA ANALYSIS PROJECT

**Team 3**
Mingxuan Yang
Jiawei Chen
Machao Deng
Jishen Yin

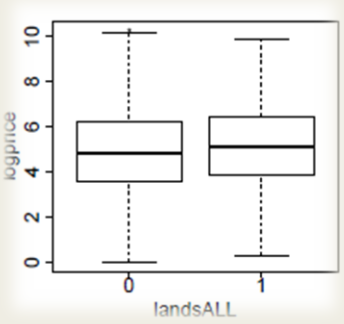
# EDA

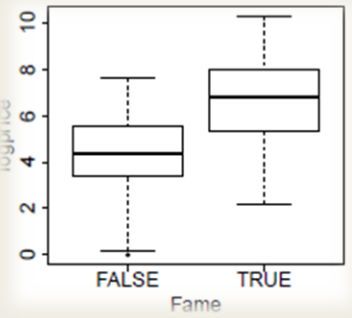
- Variable Investigation
  - *General*
  - *Variable to impute*
    - Impute with existed value | impute with `n/a`
  - *Variable to drop*
    - Def | Too hard to handle |Correlated
  - *Variable to manipulate*
    - Correction| Creation
- Important predictor identification

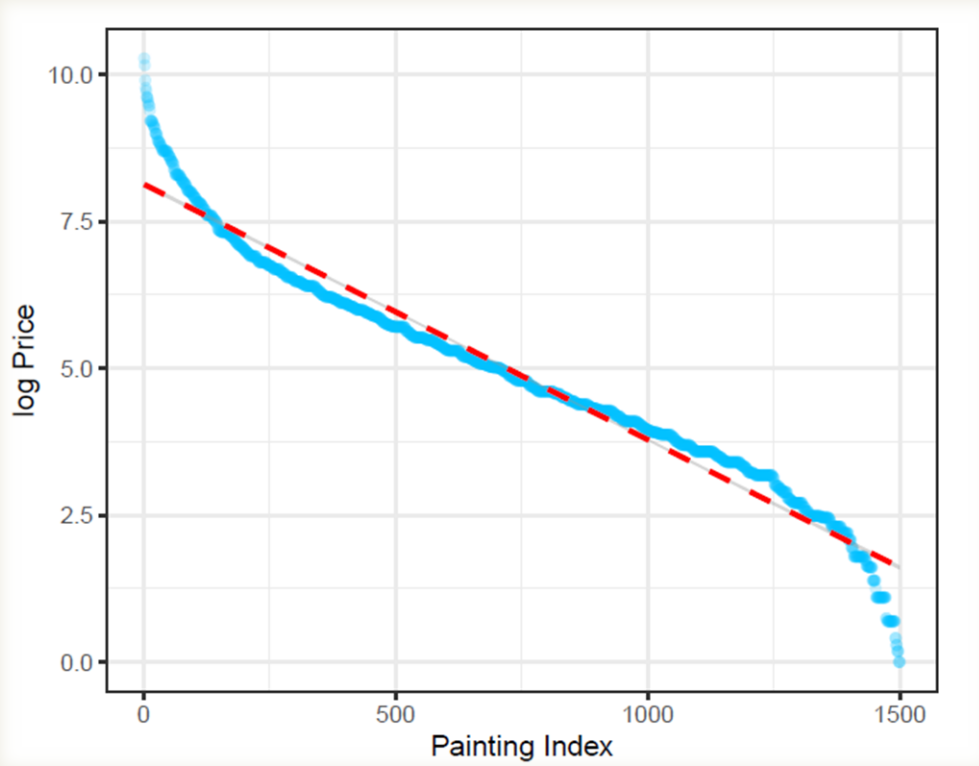
dealer, year, origin_author, finished, winningbiddertype, endbuyer, type_intermed, lrgfont, Fame

| Freq | | type_intemed | | | | |
|---|---|---|---|---|---|---|
| | | B | D | E | EB | n/a |
| Interm | 0 | 0 | 0 | 0 | 0 | 960 |
| | 1 | 11 | 94 | 39 | 1 | 0 |

```
"squ_rect"  "ovale"     ""          "round"
"oval"      "ronde"     "octagon"   "miniatu
```



# PRELIMINARY MODEL

| Linear Model Variable |
|---|
| dealer |
| year |
| origin_author |
| endbuyer |
| log_Surface |
| finished |
| lrgfont |
| winningbiddertype |
| year:winningbiddertype |

| | Linear Model |
|---|---|
| Bias | 206.171 |
| Coverage | 0.952 |
| maxDeviation | 13558.248 |
| MeanAbsDeviation | 541.419 |
| RMSE | 1487.499 |

# FINAL MODEL

| Random Forest Variable |
|---|
| year |
| log_Surface |
| dealer |
| lrgfont |
| endbuyer |
| origin_author |
| winningbiddertype |
| finished |
| type_intermed |
| diff_origin |
| precvoll |
| paired |
| Fame |
| mat |

| | Linear Model | Random Forest |
|---|---|---|
| Bias | 206.171 | 153.389 |
| Coverage | 0.952 | 0.935 |
| maxDeviation | 13558.248 | 8422.370 |
| MeanAbsDeviation | 541.419 | 313.295 |
| RMSE | 1487.499 | 886.098 |

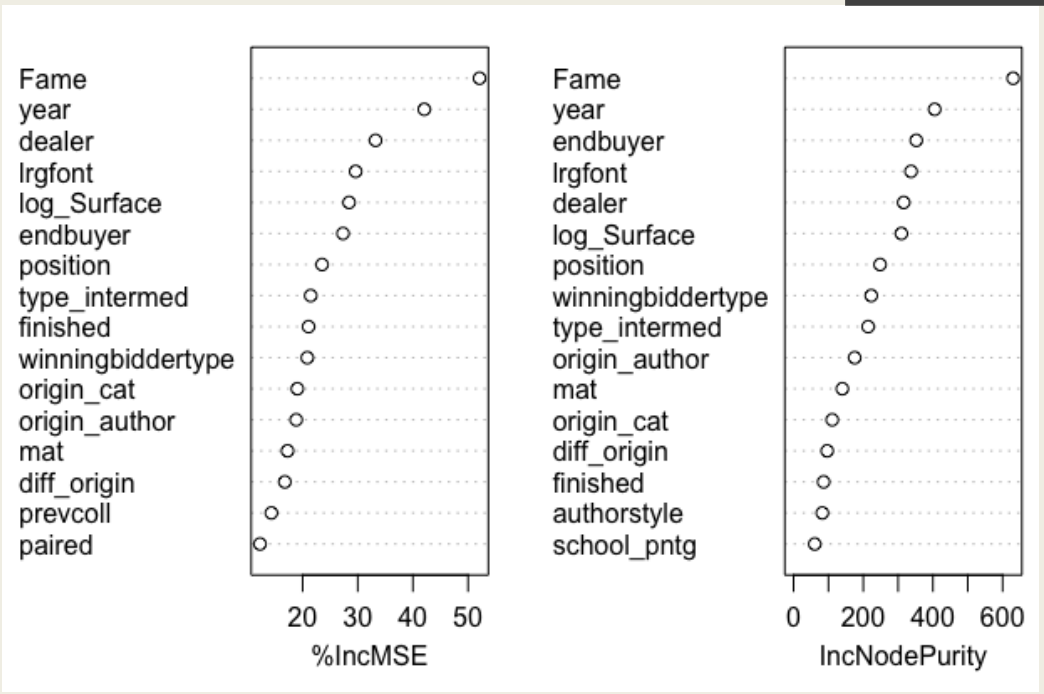


Table 6: Top 10 valued paintings

| author | year | dealer | surface | endbuyer |
|---|---|---|---|---|
| Federico Barocci | 1768 | J | 832.00 | |
| Robert Tournières | 1768 | J | 1394.00 | |
| Flemish | 1768 | J | 1386.00 | |
| Johann Wilhelm Baur | 1768 | J | 945.00 | U |
| Flemish | 1768 | J | 30.25 | C |
| Guido Reni | 1768 | J | 180.00 | U |
| Johann Wilhelm Baur | 1768 | J | 154.00 | E |
| Johann Wilhelm Baur | 1764 | L | 192.00 | |
| Anonymous | 1768 | J | 48.00 | D |
| Antoine Dieu | 1768 | J | 48.00 | D |

Table 7: Variable Importance Plot

| | %IncMSE |
|---|---|
| Fame | 94.331 |
| dealer | 83.071 |
| year | 80.737 |
| log_Surface | 44.684 |
| endbuyer | 40.299 |

# CONCLUSION