

Predictive Model Comparison Report

This report presents a comparative analysis of several predictive models trained to estimate production time.

Machine Specifications

CPU: Intel Core i7-11800H @ 2.30GHz

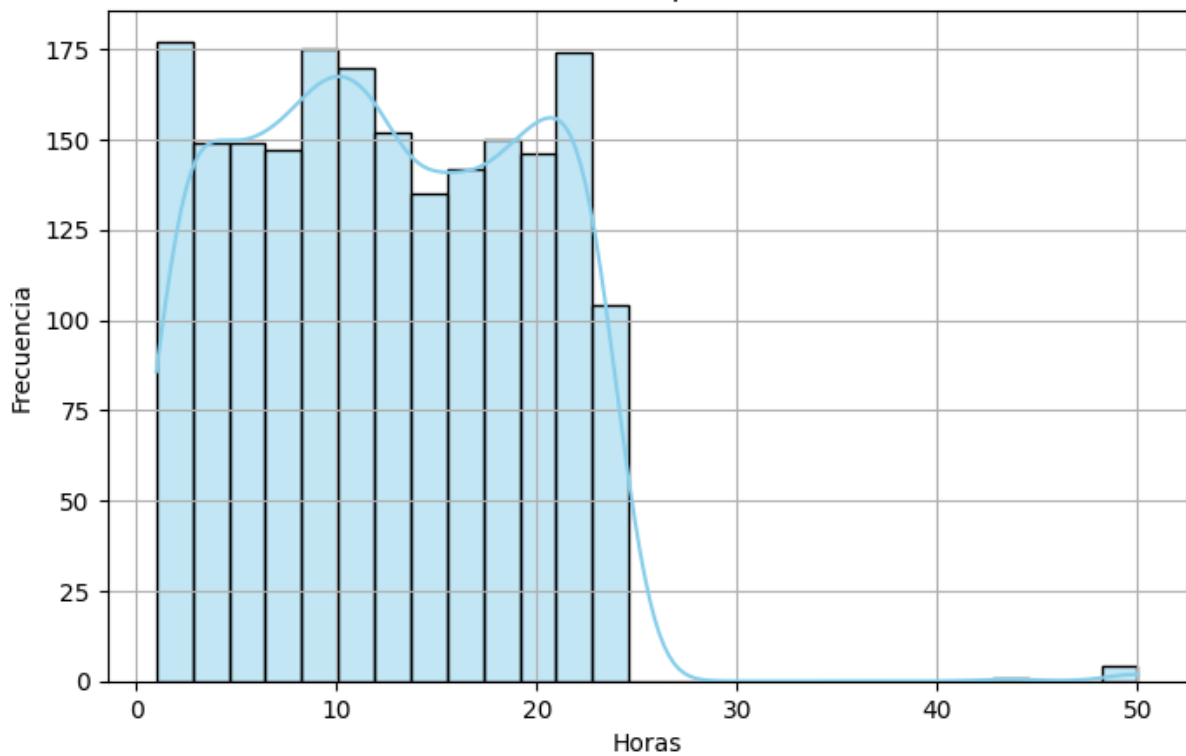
RAM: 16 GB DDR4

GPU: NVIDIA RTX 3060

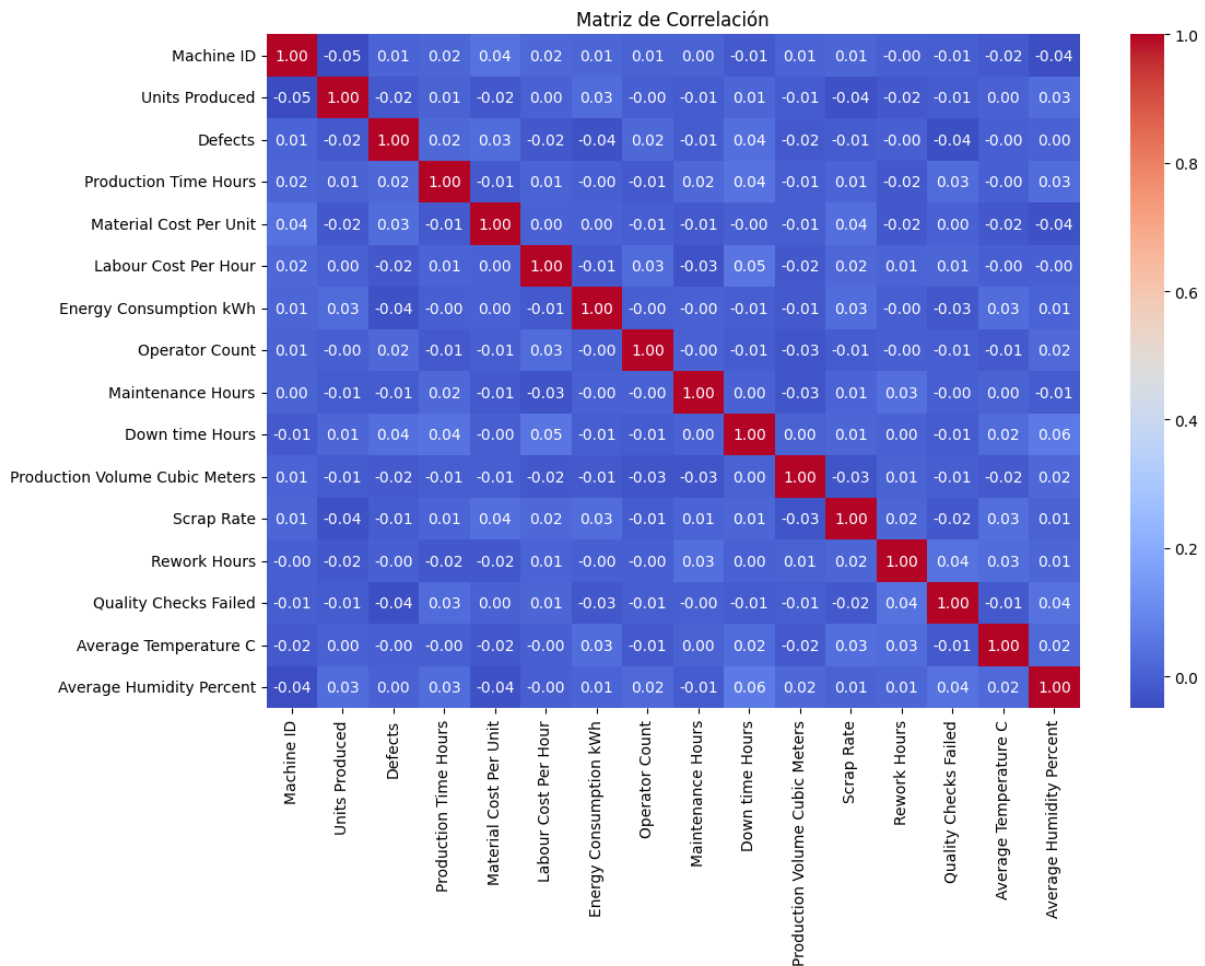
Exploratory Data Analysis (EDA) Visualizations

Histograma de Producción

Distribución de Tiempo de Producción



Matriz de Correlación



⚙ Data Preprocessing

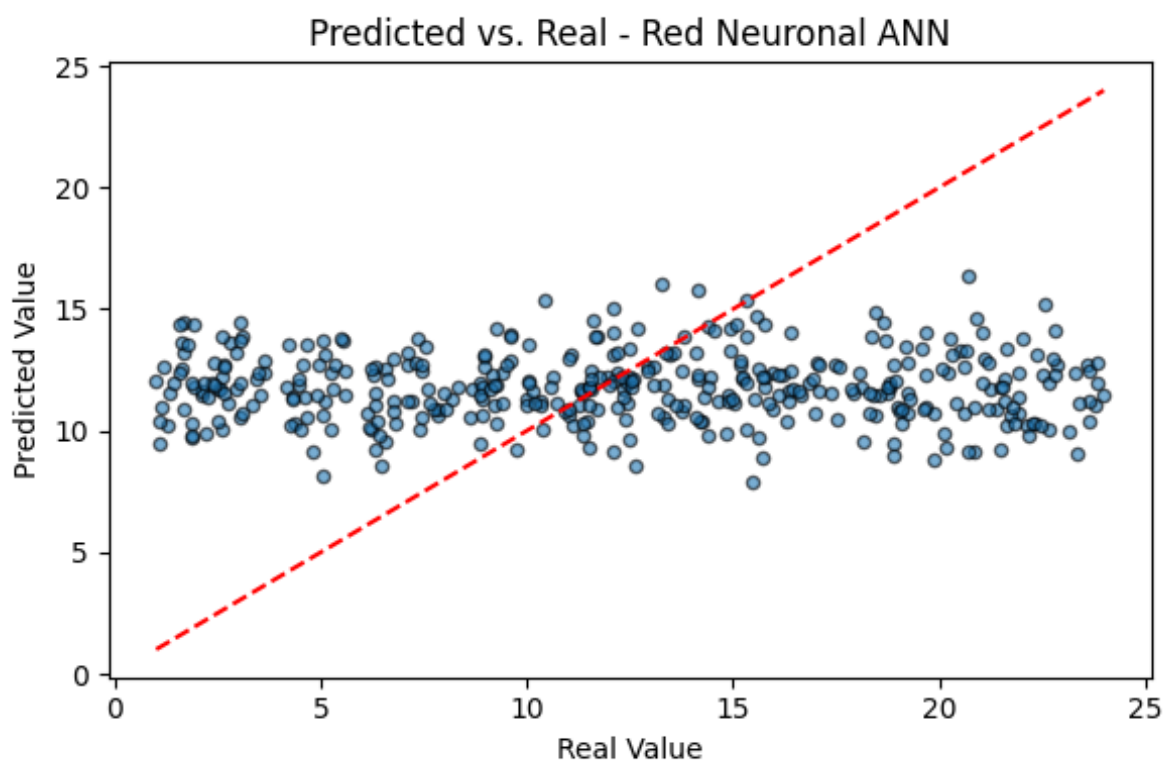
Cleaning, categorical variable encoding (One-Hot Encoding), and feature scaling (StandardScaler) techniques were applied to prepare the data before model training.

Model Evaluation Metrics

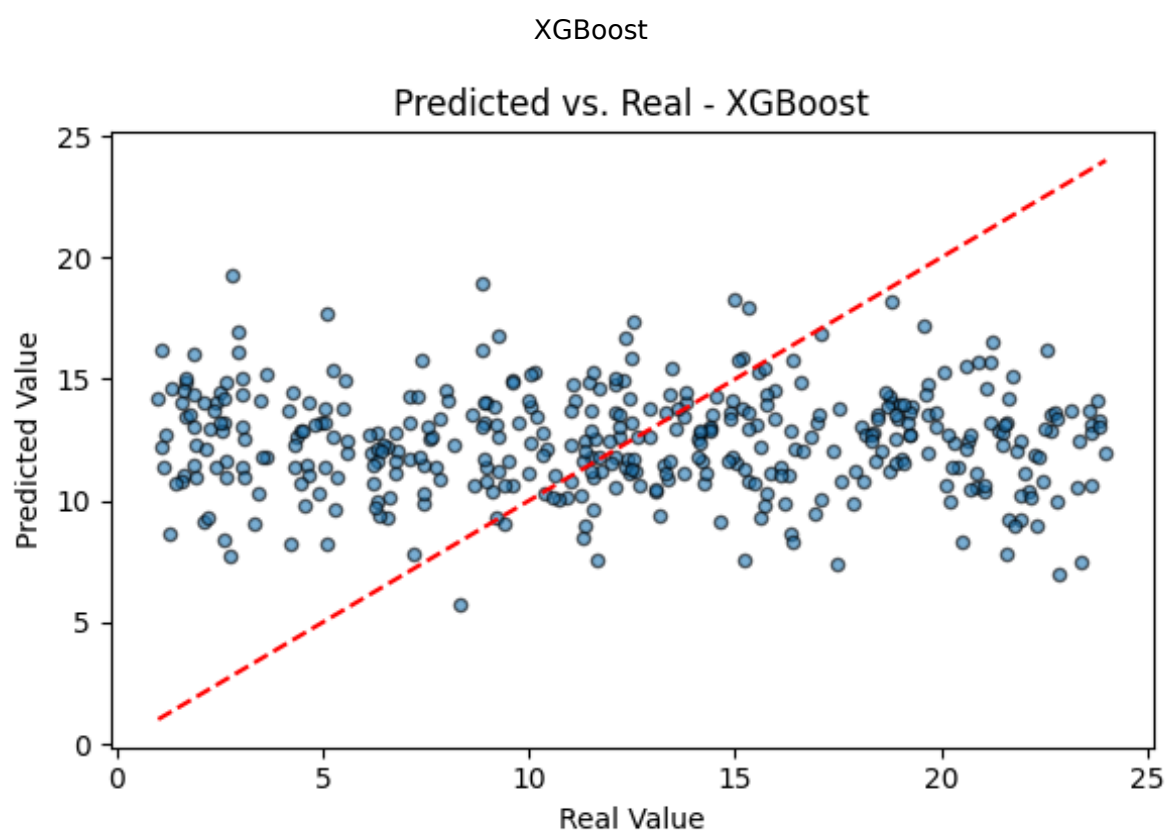
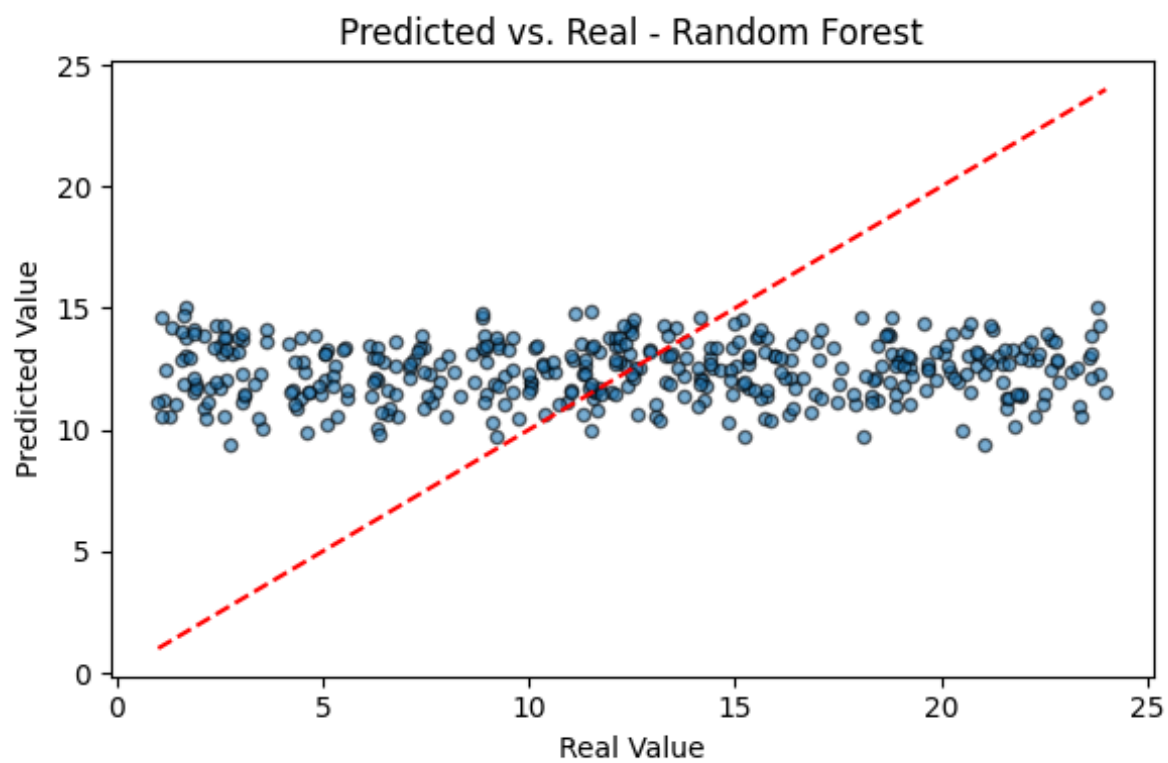
Model	MAE	MSE	R ²	Time (s)
Red Neuronal ANN	5.625	44.995	-0.052	15.20
Random Forest	5.561	43.346	-0.013	3.10
XGBoost	5.761	47.924	-0.120	2.50

Predictions vs. Real Values

Red Neuronal ANN



Random Forest



Theil's U Coefficient

Red Neuronal ANN: $U = 0.2601$

Random Forest: $U = 0.2496$

XGBoost: $U = 0.2610$

Diebold-Mariano Test

Comparison	DM Statistic	p-value
ANN vs RF	-1.441	0.150
ANN vs XGB	1.720	0.086
RF vs XGB	3.682	0.000

Conclusion

After analyzing performance metrics, statistical tests, and training times, the model with the best overall performance, considering the balance between accuracy and efficiency, was: Random Forest.