ITBA
Instituto Tecnológico de Buenos Aires

KAGGLE CHALLENGE
-
SUBMISSION OF A PREDICTIVE MODEL

13/11/2023

82.05 - Análisis Predictivo - Segundo parcial

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ITBA

AGENDA

01
Data presentation and project objective

02
Data cleaning

03
Testing several models

04
Model selected

05
Conclusion

DATA PRESENTATION AND PROJECT OBJECTIVE

Data :

- 977 541 entries
- 1 response variable "averageRating
- 27 variables (numeric and categorical)

Objective :

obtain the best prediction of the "averageRating" variable in the test dataset

averageRating	numVotes	titleType	isAdult	startYear	endYear	runtimeMinutes	genres_x	directors	...	genr
4.4	15	movie	0.0	1951	0	91	Comedy,Musical	nm0883334	...	
7.0	990	tvSeries	0.0	2007	2021	30	Action,Adventure,Animation	nm2291816,nm3088555,nm4930005,nm1746040	...	
8.1	41	tvEpisode	0.0	2011	0	44	Documentary,History,War	nm0414025	...	
4.6	48	movie	0.0	1969	0	84	Drama	nm2977268	...	
5.6	28	movie	0.0	2010	0	130	Comedy,Drama	nm2366663	...	

DATA CLEANING

averageRating	0
numVotes	0
titleType	0
isAdult	0
startYear	0
endYear	0
runtimeMinutes	0
genres_x	2
directors	0
writers	0
seasonNumber	539298
episodeNumber	539298
ordering	606918
language	606918
attributes	606918
isOriginalTitle	606918
adult	930171
budget	930171
genres_y	930171
original_language	930183
popularity	930172
production_companies	930172
production_countries	930172
revenue	930172
runtime	930383
status	930242
tagline	953696
video	930172

Number of missing values in the dataset

Nan processing :

- Remove variables with more than 75% Nan
- Complete possible variables
- Processing difficult variables ("directors" and "writers")

12 remaining explanatory variables

ITBA TESTING SEVERAL MODELS

Model	R2
Linear Regression	0.19669
Random Forest	0.47565
Gradient Boosting	0.25007
KNN	0.14138

→ Selection of Random Forest model

MODEL SELECTED

Random Forest model

Hyperparameters to test :
- n_estimators
- max_depth
- min_sample_split

Choices :
- n_estimators = 150
- max_depth = 30
- min_sample_split = 2

MODEL SELECTED

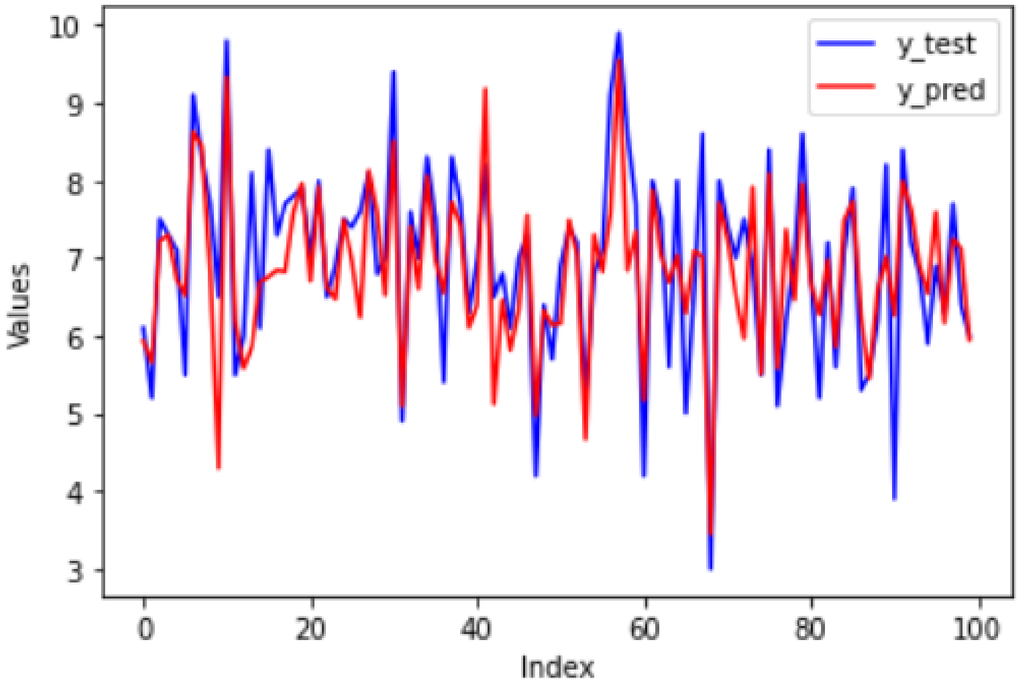
Random Forest model

```python
# Initialization
model = RandomForestRegressor(n_estimators=150, max_depth = 30, random_state=42)

# Training
model.fit(X_train, y_train)

# Prediction
y_pred = model.predict(X_test)

# Evaluation of model performance
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

print(f'Mean Squared Error: {mse} and R-squared {r2}')
```

```
Mean Squared Error: 1.016742553319181 and R-squared 0.48356767729733185
```

Score: 0.48490

Public score: 0.47891



Visualization of y_test and y_pred

Conclusion

Limits and improvements