SUPERVISED LEARNING
CLASSIFICATION PREDICTION FOR

PHYSICAL PERFORMANCE LEVEL

Dec 19, 2021
9:00 a.m.

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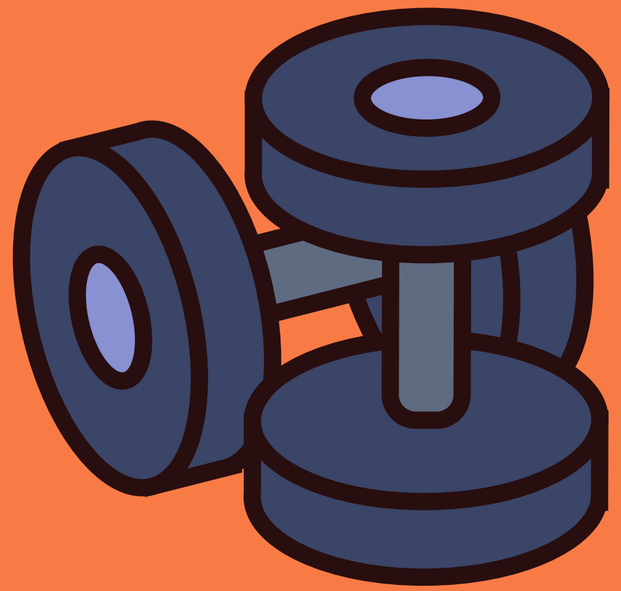
AGENDA

- Introduction
- Methodology
- Data
- Model selection
- Conclusion Q & A



INTRODUCTION

Physical performance of our body is the most important thing to improve and give it a time to grow based on moves and jumping and to help our coaches find best class for any client we creates & improve these models to be an Easy App

Data Science Methodology

Identifying the problem and the approach to fix the problem

Data requirements and collection methods

Understand the data

Generate models and evaluate them

Deploy the model and get feedback

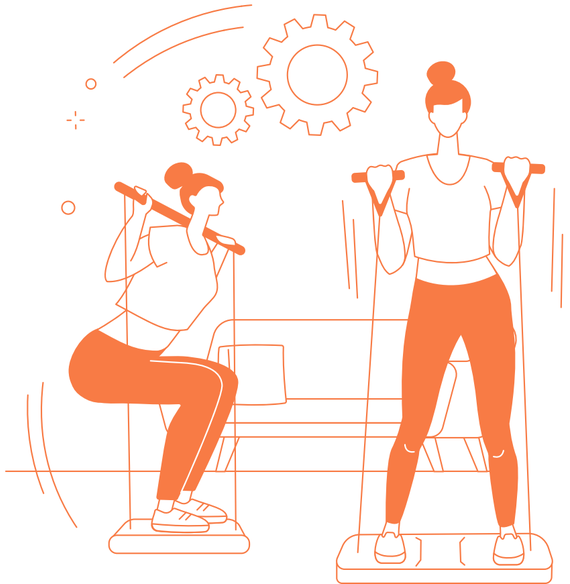
DATA

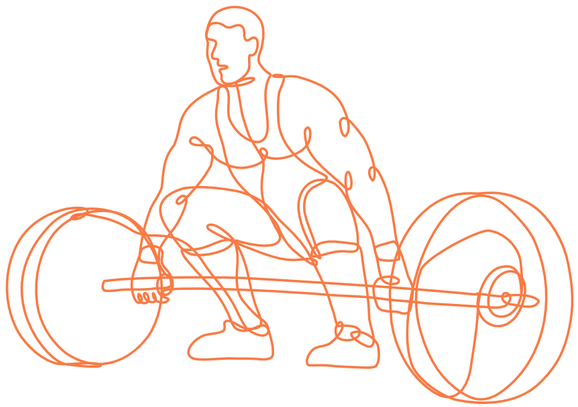
Understanding and Preparing the Data

is this data going to answer problem that I am having?

+10,000 rows

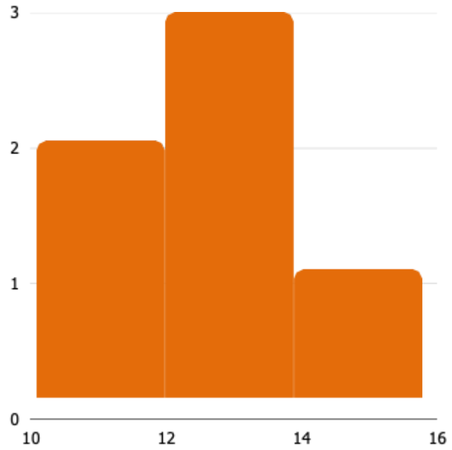
13 Columns\Featurs
-adding BMI
BMI give
weight_kg/height_cm
-Other 12 featurs
Target is called [Class]



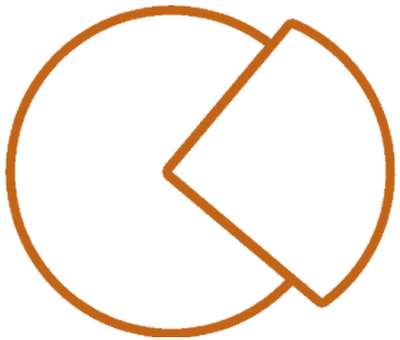


Tools

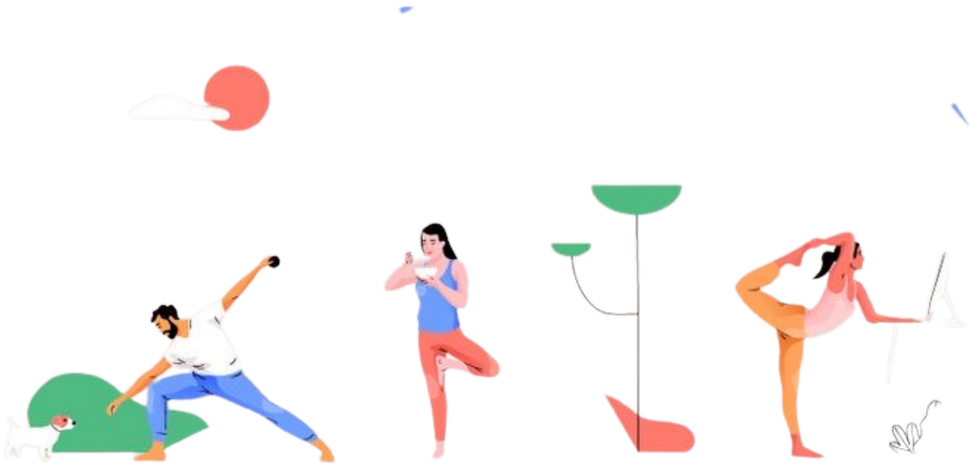
Pandas, Numpy



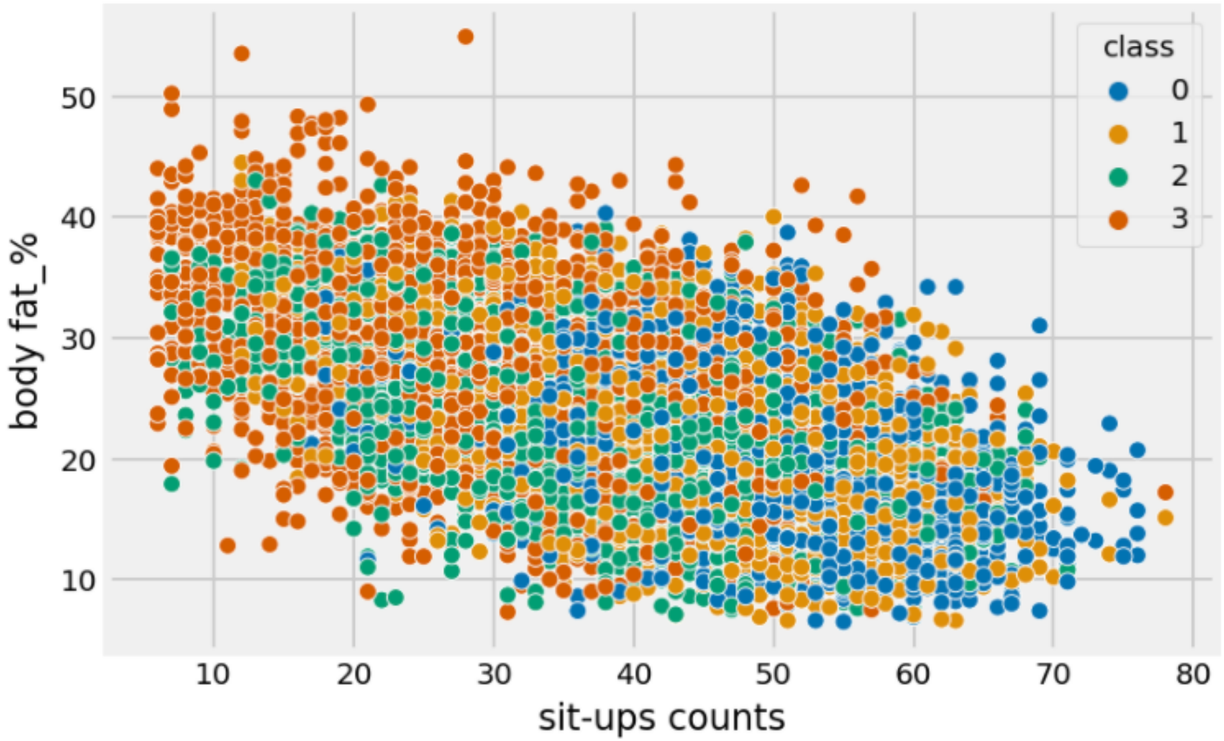
Seaborn,Matplotlib



Sklearn

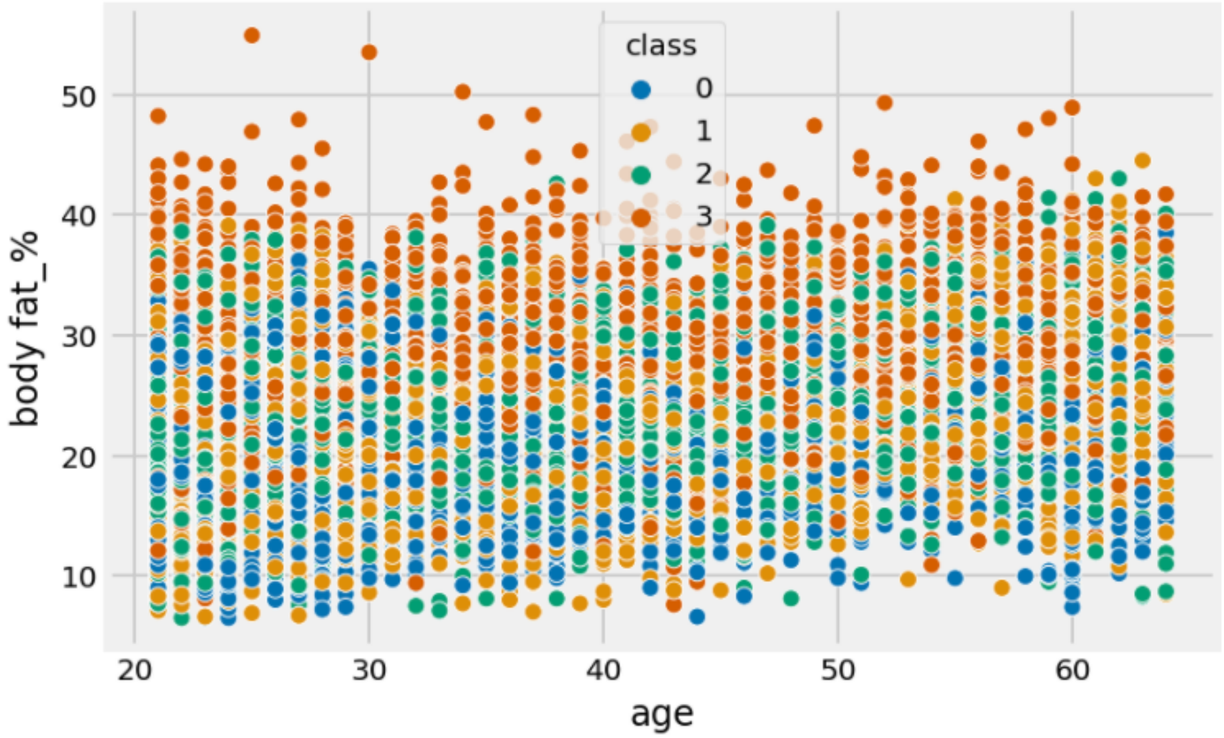


PairPlot



PairPlot (Selected Featuers)

PairPlot



PairPlot (Selected Featuers)

Model Experiments

	Experiments
0	LogisiticRegression
1	Logistic Regression _after_tuning
2	KNN
3	KNN_GridSearch
4	KNN_BEST_PARAMETR
5	KNN_tunning
6	DecisionTree
7	RandomForest
8	RandomForest_tunning
9	Xgboost
10	Xgboost_tunning
11	SVM
12	SVM_tunning

Model Selection

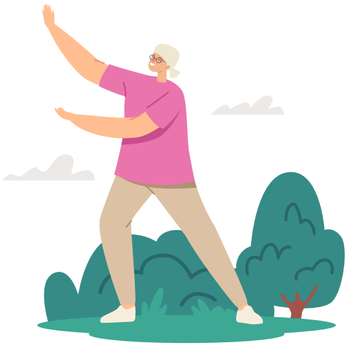
Model Name				
XGboost	Precision	Recall	F1-score	Weighted avg
Class A	0.90	0.89	0.90	0.84
Class B	0.63	0.62	0.63	0.84
Class C	0.72	0.75	0.73	0.84
Class D	0.99	0.99	0.99	0.84
Accuracy				**0.84**

Model Selection

Model Name

SVM-Tunning	Precision	Recall	F1-score	Weighted avg
Class A	0.90	0.84	0.87	0.84
Class B	0.58	0.67	0.62	0.83
Class C	0.74	0.73	0.74	0.83
Class D	0.99	0.98	0.99	0.84
Accuracy				**0.84**

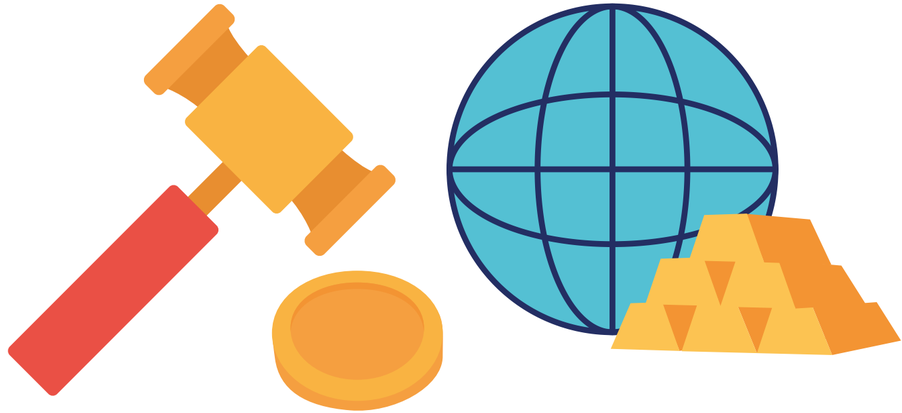
Model Selection



Model Name				
Randomforest	Precision	Recall	F1-score	Weighted avg
Class A	0.88	0.90	0.89	0.84
Class B	0.64	0.61	0.62	0.84
Class C	0.74	0.76	0.75	0.84
Class D	1.00	0.99	0.99	0.84
Accuracy				**0.84**

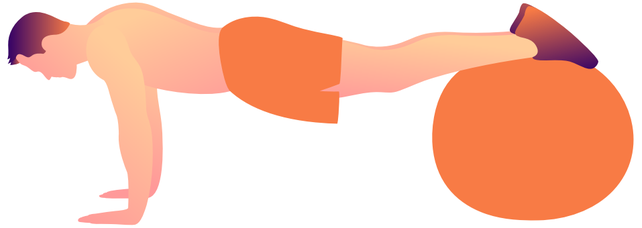
Golden Model

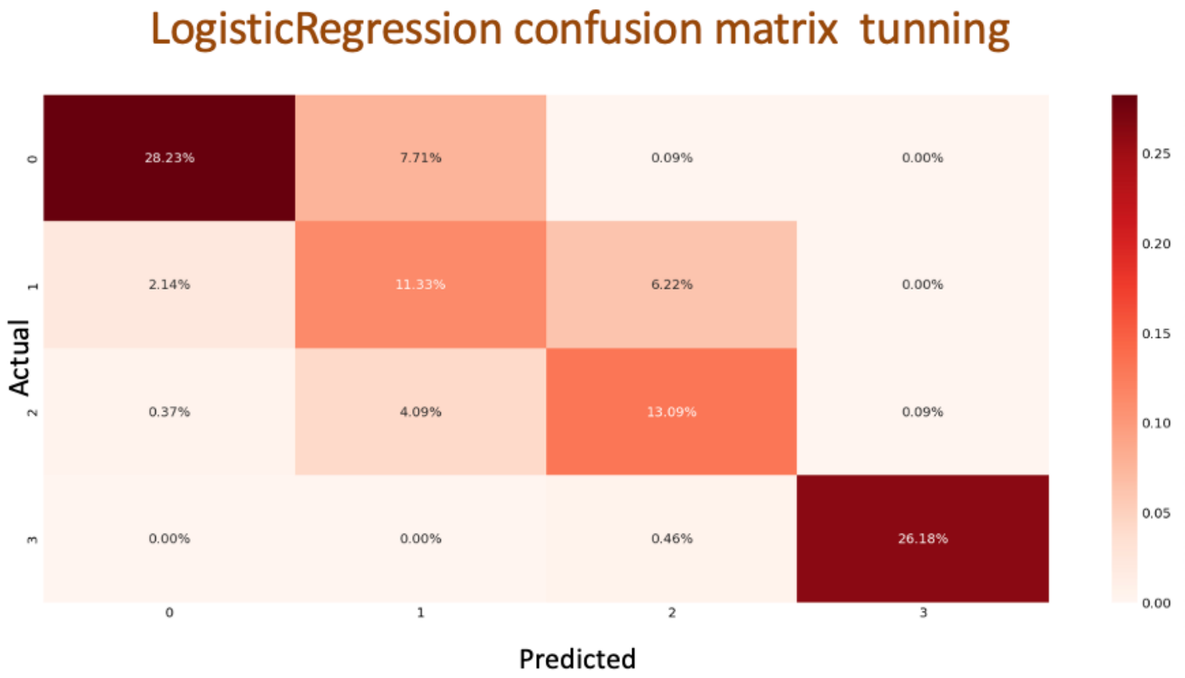
XGboost-tunning

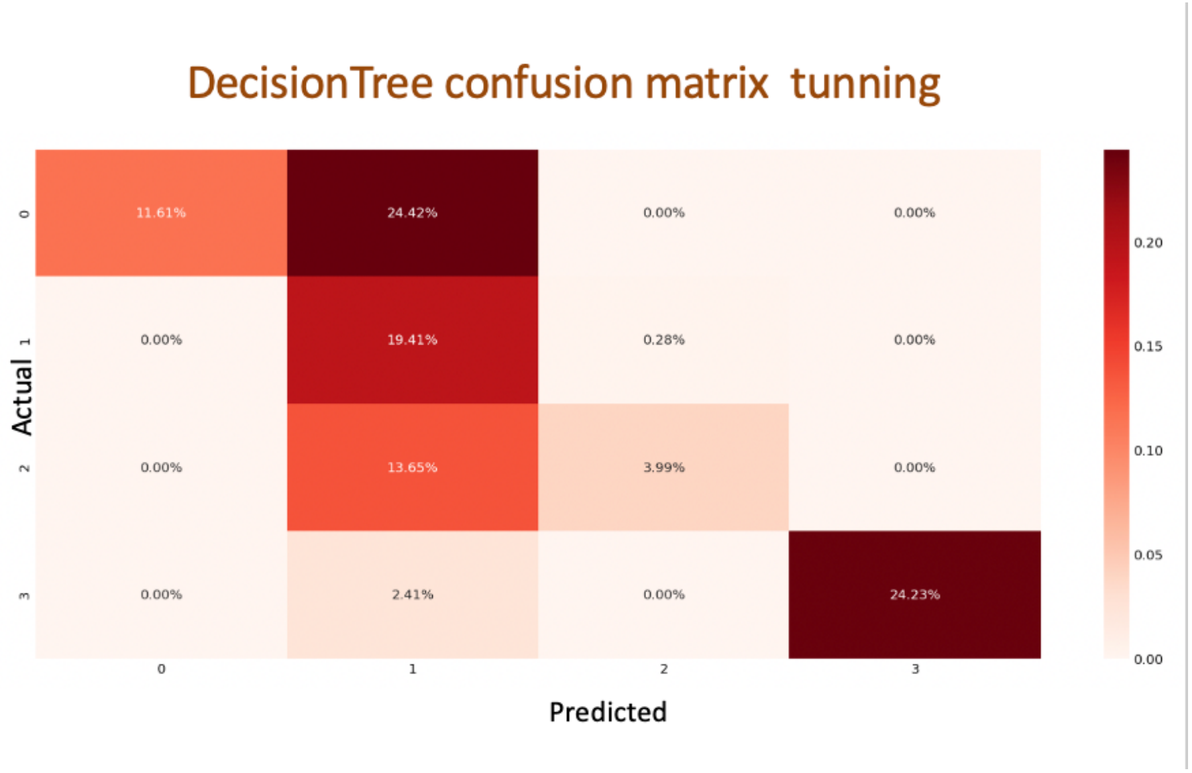


Model Name					
Xgboost-Tun	Precision	Recall	F1	Accuracy	Weighted avg
Class A	0.89	0.90	0.90	0.85	0.85
Class B	0.65	0.61	0.63		0.84
Class C	0.72	0.75	0.73		0.84
Class D	0.99	0.99	0.99		0.84

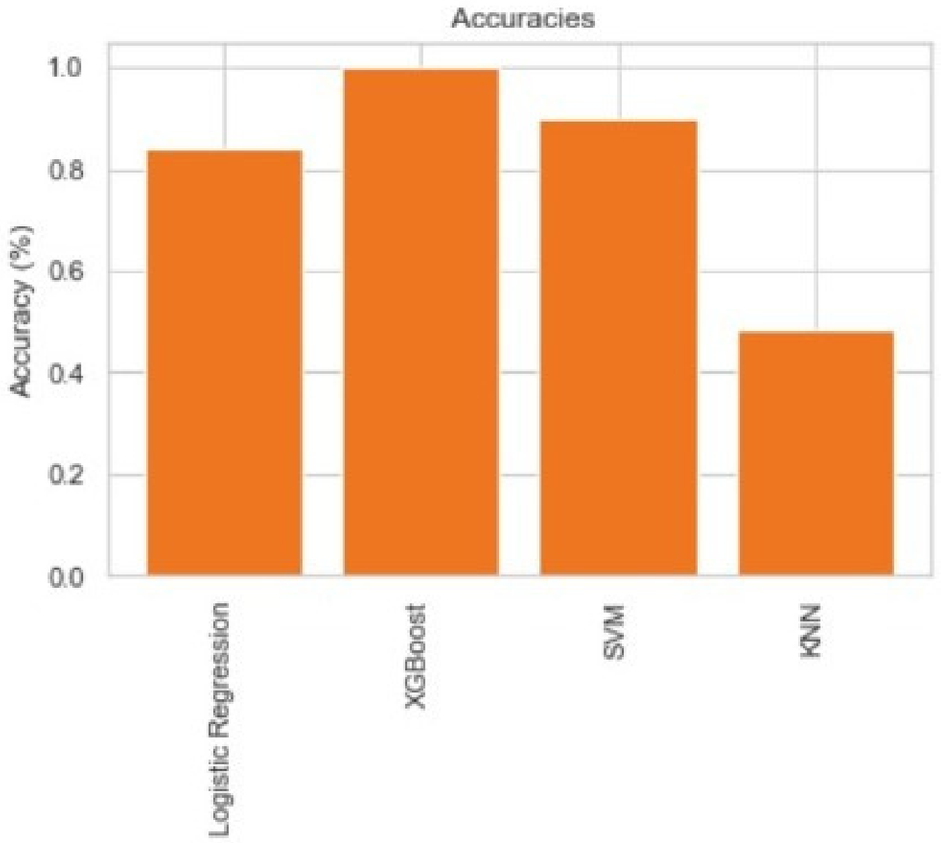
Confusion Matrix

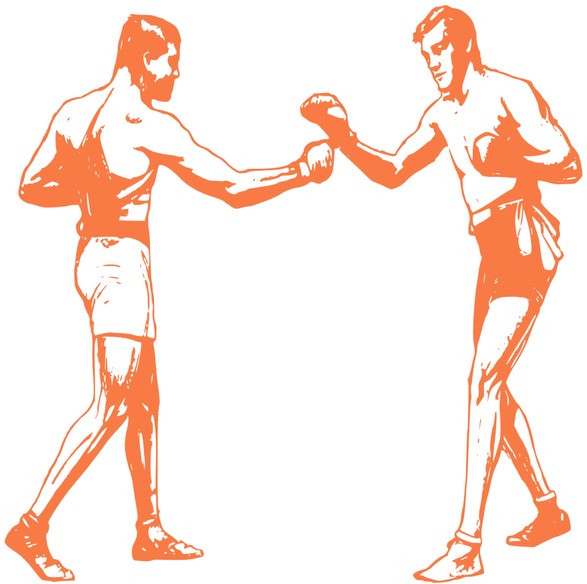






Compare Models





Example Prediction

Prediction

In [39]:
```
input_data = (24,0,62,171,20,65,95,20,100,100,200,21.1)
# now input_data is in the form of tuples.
# we need to change it to numpy array
input_data_array = np.asarray(input_data)

# reshape the numpy array as we are predicting for only one instace
input_data_reshape = input_data_array.reshape(1,-1)
prediction = model_xgb_tuned.predict(input_data_reshape)
print(prediction)
```

```
['D']
```

Deliverable

01

Classify the classes based on BMI measrments

02

Xgboost Model is the Best Model for this problem

03

GridSearch Tunning take a long time to run

04

KNN is very fast to excute

Future Plan

01

What type of Exercise best for
- Class
- Personal Final Goals
-Adding videos

02

What type of Food
-Best item
-Nutrition schedule

Conclusion

Finding the best model

GridSearchCV for Tuning

Random forest is a very powerful model

Thanks for Listening
Any Questions?