

# Predicting players rating

In this project you are going to predict the overall rating of soccer player based on their attributes such as 'crossing', 'finishing etc.

The dataset you are going to use is from European Soccer Database (<https://www.kaggle.com/hugomathien/soccer>) has more than 25,000 matches and more than 10,000 players for European professional soccer seasons from 2008 to 2016.

Download the data in the same folder and run the following command to get it in the environment

## About the Dataset

### The ultimate Soccer database for data analysis and machine learning

The dataset comes in the form of an SQL database and contains statistics of about 25,000 football matches, from the top football league of 11 European Countries. It covers seasons from 2008 to 2016 and contains match statistics (i.e: scores, corners, fouls etc...) as well as the team formations, with player names and a pair of coordinates to indicate their position on the pitch.

- +25,000 matches
- +10,000 players
- 11 European Countries with their lead championship
- Seasons 2008 to 2016
- Players and Teams' attributes\* sourced from EA Sports' FIFA video game series, including the weekly updates
- Team line up with squad formation (X, Y coordinates)
- Betting odds from up to 10 providers
- Detailed match events (goal types, possession, corner, cross, fouls, cards etc...) for +10,000 matches

The dataset also has a set of about 35 statistics for each player, derived from EA Sports' FIFA video games. It is not just the stats that come with a new version of the game but also the weekly updates. So for instance if a player has performed poorly over a period of time and his stats get impacted in FIFA, you would normally see the same in the dataset.

## Python skills required to complete this project

### SQL:

The data is in SQL database so students need to retrieve using query language. They also need to know how to connect SQL database with python. The library we are using for this is 'sqlite3'.

SQLite3 can be integrated with Python using sqlite3 module, which was written by Gerhard Haring. It provides an SQL interface compliant with the DB-API 2.0 specification described by PEP 249. You do not need to install this module separately because it is shipped by default along with Python version 2.5.x onwards.

To use sqlite3 module, you must first create a connection object that represents the database and then optionally you can create a cursor object, which will help you in executing all the SQL statements.

## Pandas:

Pandas is an open-source, BSD-licensed Python library providing high-performance, easy-to-use data structures and data analysis tools for the Python programming language. Python with Pandas is used in a wide range of fields including academic and commercial domains including finance, economics, Statistics, analytics, etc. In this tutorial, we will learn the various features of Python Pandas and how to use them in practice.

## Scikit Learn

Scikit-learn provides a range of supervised and unsupervised learning algorithms via a consistent interface in Python.

The library is built upon the SciPy (Scientific Python) that must be installed before you can use scikit-learn. This stack that includes:

- NumPy: Base n-dimensional array package
- SciPy: Fundamental library for scientific computing
- Matplotlib: Comprehensive 2D/3D plotting
- IPython: Enhanced interactive console
- Sympy: Symbolic mathematics
- Pandas: Data structures and analysis

Extensions or modules for SciPy are conventionally named SciKits. As such, the module provides learning algorithms and is named scikit-learn.

The vision for the library is a level of robustness and support required for use in production systems. This means a deep focus on concerns such as easy of use, code quality, collaboration, documentation and performance.

## Machine Learning skills required to complete the project

### Supervised learning

Supervised learning deals with learning a function from available training data. A supervised learning algorithm analyzes the training data and produces an inferred function, which can be used for mapping new examples.

## Regression

Regression is a parametric technique used to predict continuous (dependent) variable given a set of independent variables. It is parametric in nature because it makes certain assumptions (discussed next) based on the data set. If the data set follows those assumptions, regression gives incredible results.

## Model evaluation

Student must know how to judge a model on unseen data. What metric to select to judge the performance

## Let's get started.....

### Import Libraries

```
In [1]: import sqlite3
import pandas as pd
from sklearn.tree import DecisionTreeRegressor from
sklearn.linear_model import LinearRegression from
sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error from
math import sqrt
```

### Read Data from the Database into pandas

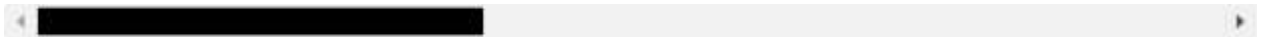
```
In [2]: # Create your connection.
cnx = sqlite3.connect('database.sqlite')
df = pd.read_sql_query("SELECT * FROM Player_Attributes", cnx)
```

```
In [3]: df.head()
```

```
Out[3]:
```

	id	player_fifa_api_id	player_api_id	date	overall_rating	potential	preferred_foot	attacking_
0	1	218353	505942	2016-02-18 00:00:00	67.0	71.0	right	
1	2	218353	505942	2015-11-19 00:00:00	67.0	71.0	right	
2	3	218353	505942	2015-09-21 00:00:00	62.0	66.0	right	
3	4	218353	505942	2015-03-20 00:00:00	61.0	65.0	right	
4	5	218353	505942	2007-02-22 00:00:00	61.0	65.0	right	

5 rows x 42 columns



```
In [ ]:
```

### 3. Output

**This project consists of 3000 marks and has to be submitted in .ipynb/PDF format in the upcoming session for evaluation**