UNIVERSITY OF ASIA PACIFIC

Department of Computer Science & Engineering

Course Title   – Artificial Intelligence and Expert Systems Lab.

Course Code   – CSE-404.

Project   – Implementation of Multivariable Linear Regression Using A Public Dataset

SUBMITTED BY

Shawan Das.

ID – **19101020**

Section – **A**1

SUBMITTED TO

Dr. Nasima Begum

University of Asia Pacific

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Problem Title: Implement Multivariable Linear Regression Using a Public Dataset

Problem Description: Implementation of Linear Regression model with a dataset. The Dataset must be multivariant. At the basis of other parameters, we have to predict another parameter.

Objective: There are several approach in Machine Learning to predict a data at the basis of other data. In this project we are going to implement "Linear Regression"- model to predict data.

For this approach, I'm going to use a game(Call of Duty) dataset which is about (1558, 19) in size . But we will only use (1558,15) data for independent(X) axis and (1558,) data for dependent(y) axis.

Dataset: [Call of Duty](#)

Dataset Info:

```
  1   dataset.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1558 entries, 0 to 1557
Data columns (total 16 columns):
 #   Column          Non-Null Count   Dtype
---  ------          --------------   -----
 0   wins            1558 non-null    int64
 1   kdRatio         1558 non-null    float64
 2   killstreak      1558 non-null    int64
 3   level           1558 non-null    int64
 4   losses          1558 non-null    int64
 5   prestige        1558 non-null    int64
 6   hits            1558 non-null    int64
 7   timePlayed      1558 non-null    int64
 8   headshots       1558 non-null    int64
 9   averageTime     1558 non-null    float64
 10  gamesPlayed     1558 non-null    int64
 11  assists         1558 non-null    int64
 12  misses          1558 non-null    int64
 13  xp              1558 non-null    int64
 14  scorePerMinute  1558 non-null    float64
 15  shots           1558 non-null    int64
dtypes: float64(3), int64(13)
memory usage: 194.9 KB
```

for x axis, we will use 'wins', 'kdRatio', 'killstreak', 'level', 'losses', 'prestige' ,'hits', 'timePlayed', 'averageTime', 'gamesPlayed', 'assists', 'misses', 'xp', 'scorePerMinute', 'shots' – data

and for y-axis I will use "headShots" data. So basically I'm going to predict the Headshot values.

But before implementation, I've to normalize those data for better prediction.

After Normalizing Data:

|	wins	kdRatio	killstreak	level	losses	prestige	hits	timePlayed	headshots	averageTime	gamesPlayed	assists	misses	xp	scorePerMinute	shots
0	0.000000	0.000000	0.0	0.000000	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.000000	0.0	0.000000	0.0	0.0
1	0.000000	0.000000	0.0	0.000000	0.0	0.940171	0.0	0.000936	0.000000	0.005189	0.0	0.000000	0.0	0.000047	0.0	0.0
2	0.000000	0.343750	0.0	0.018433	0.0	0.940171	0.0	0.004279	0.001365	0.023721	0.0	0.000069	0.0	0.003226	0.0	0.0
3	0.000853	0.133333	0.0	0.000000	0.0	0.000000	0.0	0.000401	0.000000	0.002224	0.0	0.000000	0.0	0.000077	0.0	0.0
4	0.000000	0.066667	0.0	0.000000	0.0	0.940171	0.0	0.000669	0.000085	0.003706	0.0	0.000000	0.0	0.000067	0.0	0.0

Plot Some Data:
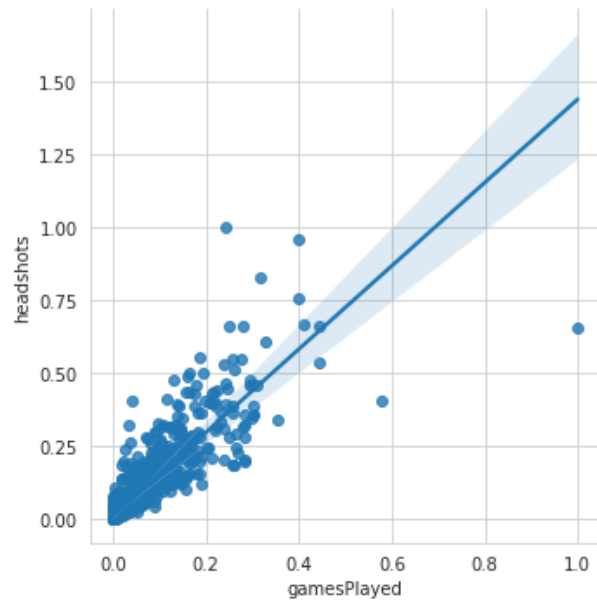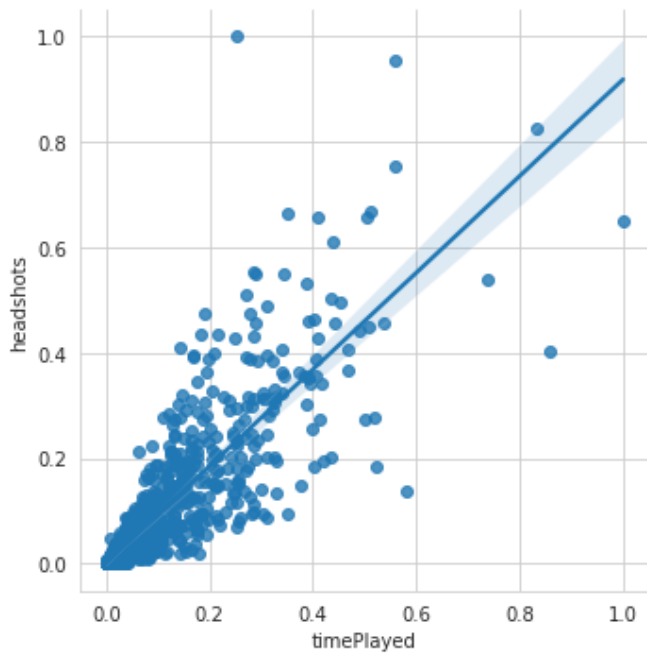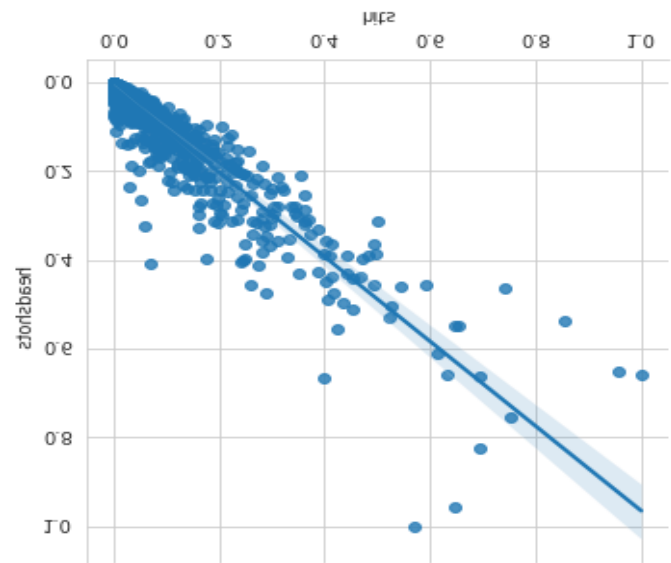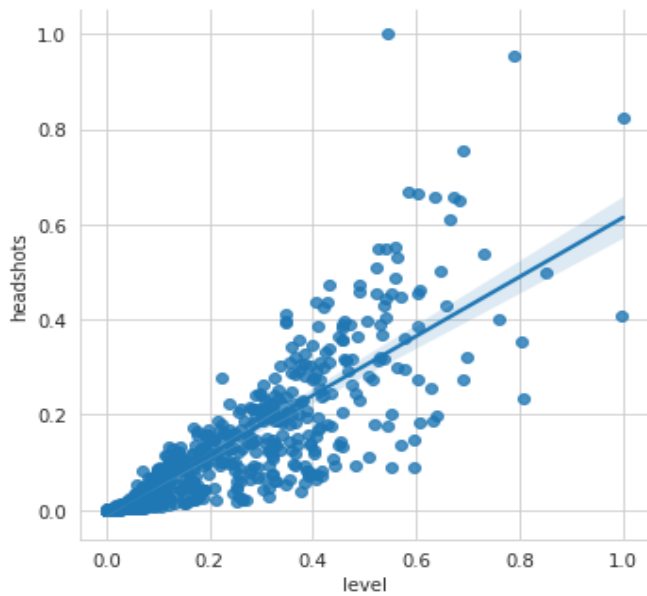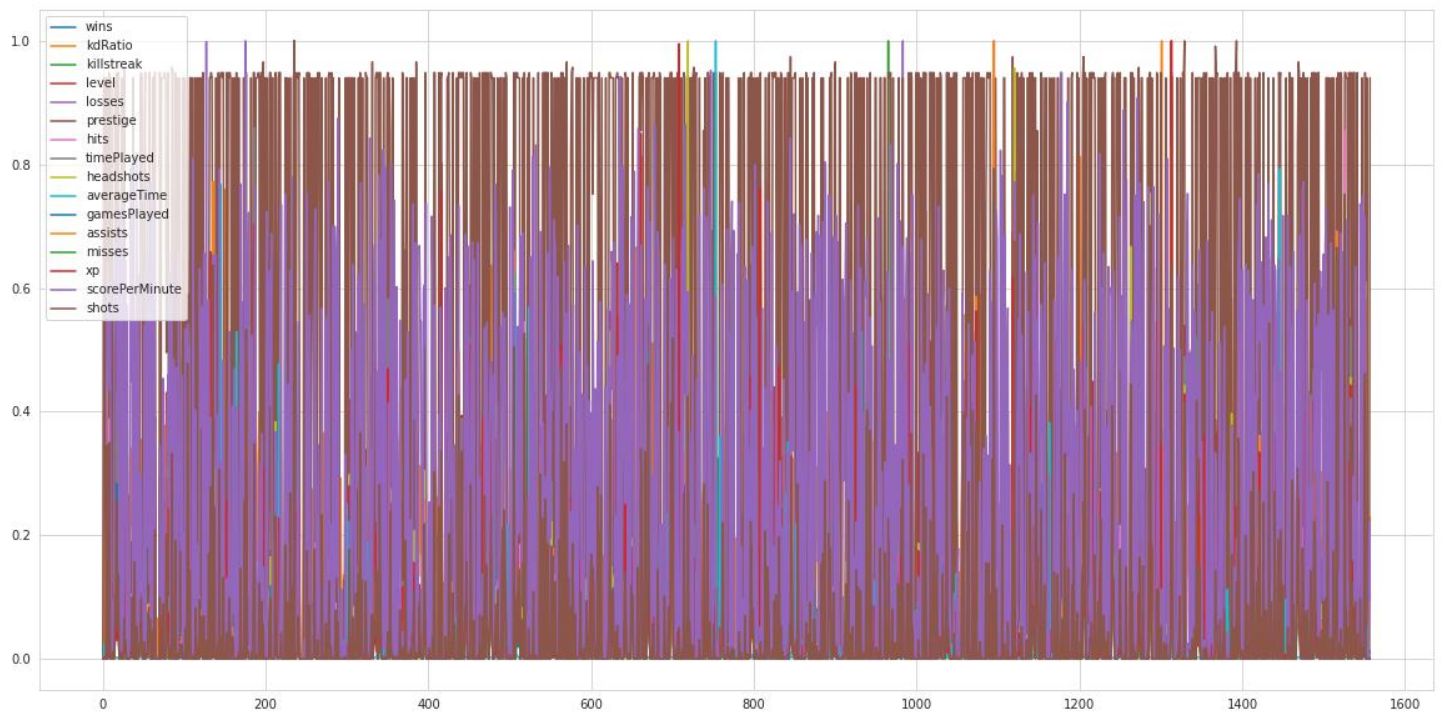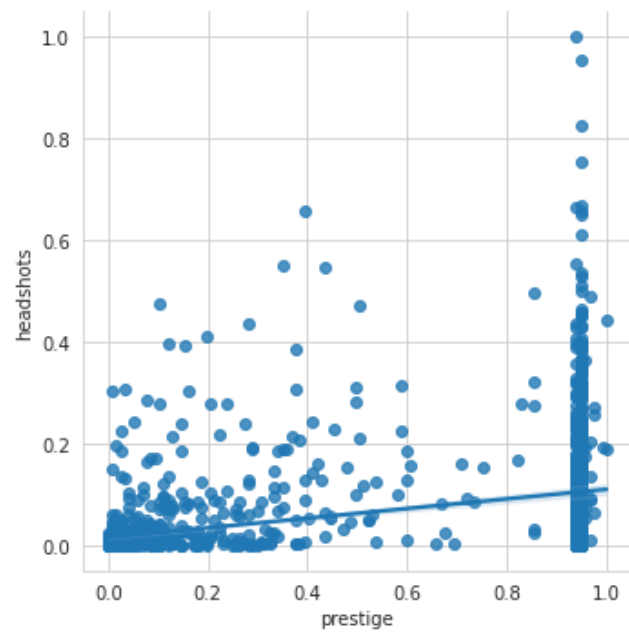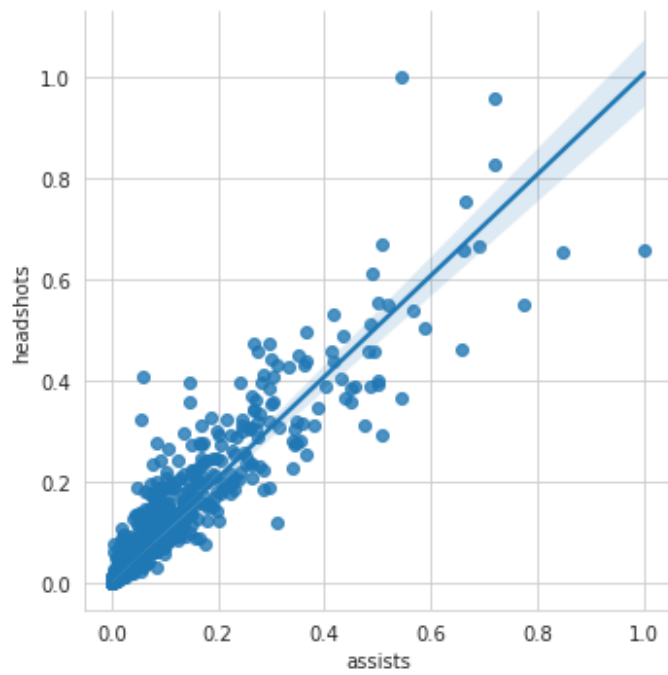
Tools & Languages:

- Language – Python
- IDE: Google Collab

Predictions Graph:
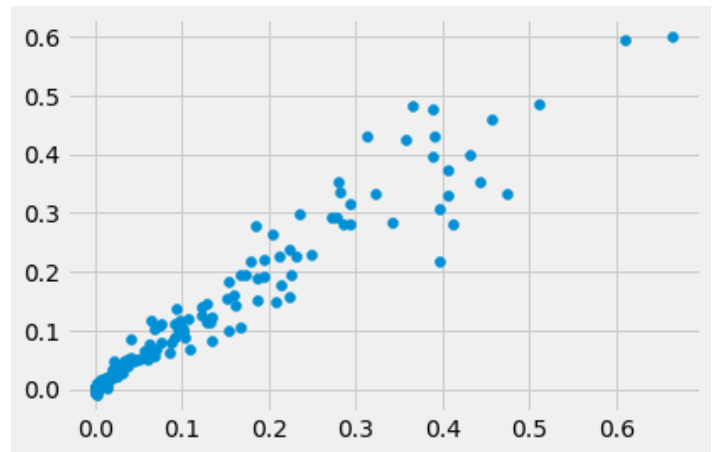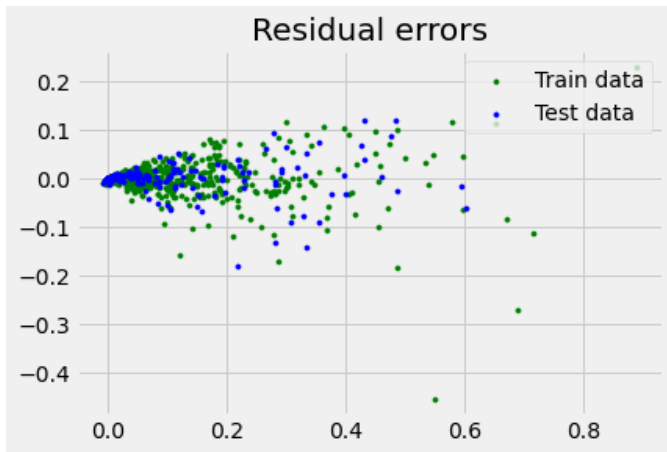
Source Code: [SKLearn,](#) [Manual,](#) [Manual(2)](#)

Challenges & Conclusion:

SkLearn implementation part was easier than the Manual approach. SkLearn model provided around 95.04%. But the manual part is incomplete because of some space errors.