# PROJECT


**SIES (NERUL) COLLEGE OF ARTS, SCIENCE AND COMMERCE**

NAAC ACCREDITED 'A' GRADE COLLEGE (ISO 9001:2008 CERTIFIED INSTITUTION) NERUL, NAVI MUMBAI – 400706

**PROJECT PROPOSAL**

**ON**

# MMA FIGHTERS & GYMS

**PROJECT WORK SUBMITTED IN PARTIAL FULLFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF M.Sc. (COMPUTER SCIENCE)**

**SUBMITTED BY**

**GIRISH ANAND BANGERA (2312634)**

**PROJECT GUIDE**

## ASST PROF. MANSAVI SHARMA

# SIES (NERUL) COLLEGE OF ARTS SCIENCE AND COMMERCE

NAAC ACCERDITED 'A' GRADE COLLEGE

(ISO 9001:2015 CERTIFIED INSTITUTION)

NERUL,NAVI MUMBAI - 400706


THIS IS TO CERTIFY THAT THE PROJECT TITLED

## MMA FIGHTERS & GYMS

IS UNDERTAKEN BY

## GIRISH ANAND BANGERA

Seat No: 03

In partial fulfilment of MSc - IT / CS Degree (Semester IV ) Examination in the academic year 2020-21 and has not been submitted for any other examination and does not form part of any other course undergone by the candidate. It is further certified that he/she has completed all the required phases of the project.

Project Guide External Examiner

Head of Department Principal

# ACKNOWLEDGMENT

I extend my heartfelt gratitude and thanks to Asst. Professor Manasvi Sharma for providing me excellent guidance to work on this project and for their understanding and assistance by providing all the necessary information needed for my project topic.

I would also like to acknowledge all the staffs for providing a helping hand to us in times of queries & problems. The project is a result of the efforts of all the peoples who are associated with the project directly or indirectly, who helped us to work to complete the project within the specified time frame. They motivated me in the project and gave a feedback on it to improve my adroitness.

Thanks to all my teachers, who were a part of the project in numerous ways and for the help and inspiration they extended to me and for providing the needed motivation.

With all Respects & Gratitude, I would like to thanks to all the people, who have helped for the development of the Project.

**GIRISH ANAND BANGERA**
**MSc. Computer Science (Part-II)**
**SIES (Nerul) College of Arts, Science and Commerce.**

# ABSTRACT

This project is based on Martial Arts and provides a general, high-performance framework for the prediction task.
The main goal of this project is understanding the people opinion and convince them to do / join Martial Arts .
The main research method is quantitative and a customer survey was conducted to investigate about the people's perspective about Martial arts. Moreover, the survey result helps to understand the people psychology towards Martial arts .

# Introduction

*Mixed martial arts (MMA) is a full-contact combat sport that allows a wide variety of fighting techniques and skills from a mixture of other combat sports to be used in competition.* The rules allow usage of both striking and grappling techniques while standing and on the ground. Competitions allow athletes of different backgrounds to compete.

An interesting lens through which to view that development is the clinch, an area that is used in a number of sports with different contexts; wrestling features the underhook/overhook and the bodylock more prominently than a sport like Muay Thai does, for instance, where Muay Thai uses more collarties and frames to create opportunities for knees and elbows in close quarters. The best parts of MMA aren't just watching these conflicting philosophies challenge one another (a great example being much of dos Anjos against Covington, where a relentless American wrestler's attempts at consolidating control positions faced a crafty Thai-style clincher's strikes on the inside), but also in how one fighter can meld both schools of thought together to create something more viable than each part; Jon Jones' clinch game, for instance, has the influences from his base as a wrestler, but also has elbowing from an infighting position more reminiscent of boxing than anything else, and each component informs the other. That level of interplay is unique among combat sports, and creates a metagame that's similarly different.

*Each row is a compilation of both fighter stats. Fighters are represented by 'red' and 'blue'* (for red and blue corner). So for instance, red fighter has the complied average stats of all the fights except the current one. The stats include damage done by the red fighter on the opponent and the damage done by the opponent on the fighter (represented by 'opp' in the columns) in all the fights this particular red fighter has had, except this one as it has not occured yet . blue fighter has the complied average stats of all the fights except the current one. The stats include damage done by the blue fighter on the opponent and the damage done by the opponent on the fighter (represented by 'opp' in the columns) in all the fights this particular blue fighter has had, except this one as it has not occured yet .

A fight is much more than individual moves, of course. Offensive output and pace, transitions from phase to phase, confidence, rhythm and a dozen other advanced concepts all matter. Each of those things, however, is built on the foundation of basic technical acumen.

The main research method is quantitative and a customer survey was conducted to investigate the main motivation and factors that to change the people's perspective towards martial arts.

They can help answer questions like:

- What aspects of Martial Arts do you find most entertaining?
- At What Age did they hear about MMA(Mixed Martial Arts) or any martial arts?
- Do any Martial Arts Help to Improve confidence?
- Do Martial Arts Helps to Improves Physical Toughness?
- Mixed Martial Arts Helps to Improves Mental Toughness and Resilience?
- Martial Arts Helps to Improve Overall Body Coordination and Proprioception?
- Martial Arts leads to fitness ?
- Martial Arts Helps to Lose weight?
- Do Martial Arts Helps to Stress Relief and Improve Sleep?

# Implementation Details

The research design for the fulfillment of objectives and answering questions. It is a master plan specifying the method and procedures for collecting and analyzing needed information.
Statistical Data Models such as Correlation, Regression Analysis can be used to identify the relations among the data variables. These models that are descriptive of the data are helpful in simplifying analysis and communicate results.

## Data Analysis

Data that is processed, organized and cleaned would be ready for the analysis. Various data analysis techniques are available to understand, interpret, and derive conclusions based on the requirements. Data Visualization may also be used to examine the data in graphical format, to obtain additional insight regarding the messages within the data.
Statistical Data Models such as Correlation, Regression Analysis can be used to identify the relations among the data variables. These models that are descriptive of the data are helpful in simplifying analysis and communicate results.
The process might require additional Data Cleaning or additional Data Collection, and hence these activities are iterative in nature.


**Data Preprocessing:**

The data preprocessing unit is responsible for preparing a data for further processing. Null values in dataset can be removed or filled.

**Data Classification:**

Classification will be based on various factors that are classification by their age, gender, and product rating, product price, etc. To find out answers of above questions I am using some algorithms to find out proper algorithms. Here I am using some algorithms base on that I can easily classify my data.

Classification Algorithms:

Random forest Tree:

- This algorithm is flexible and helps produce great results most of the time. Reason for using
- Random Forest Tree algorithm is its simplicity and diversity.

**Data Analysis:**

Once the data are collected, we must analyze and interpret theresults. Data can be represented in graph for analysis which can be used for further prediction as a result.

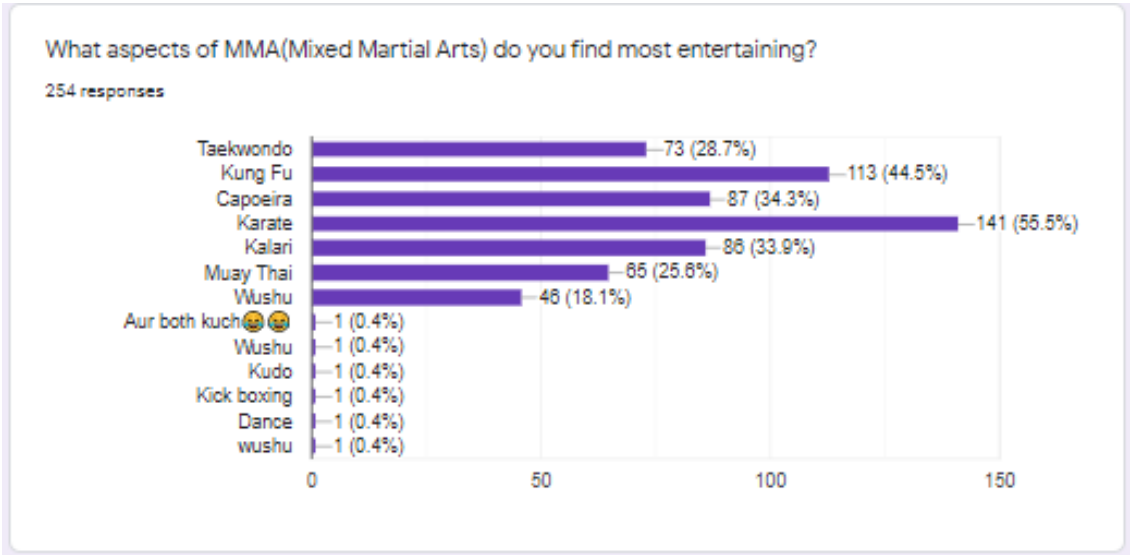
**Python Programming with Google Colab:**

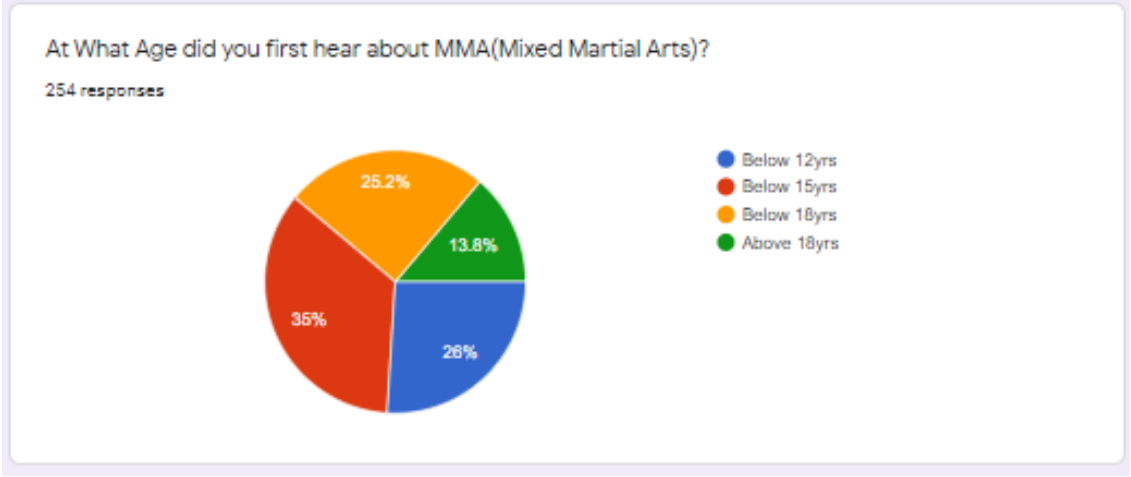
Google Colab is the best project from Google Research. It is an open-source, Jupyter based environment. It helps us write and execute Python based code, other Python-based third-party tools and machine learning frameworks such as Python, PyTorch, Tensorflow, Keras, OpenCV and many others. It runs on the web-browser.
We can also mount it into Google Drive. Google Colab requires no configuration to get started and provides free access to GPUs.

# Experimental set up and results

Google Forms can compile all the standard survey fields--such as text, multiple choice questions, dropdowns, linear scales, and grids--to serve all sorts of data collection needs.
four steps as following :

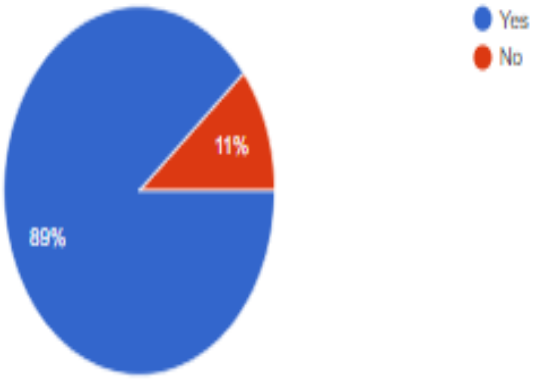
1. Created my questions
2. Create form
3. Send form
4. Receive and review responses



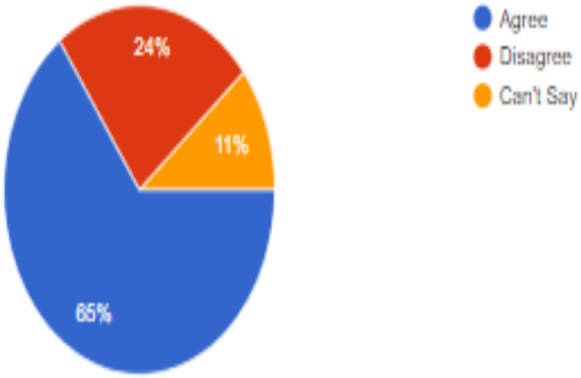
MMA(Mixed Martial Arts) Help to Improve confidence?

254 responses



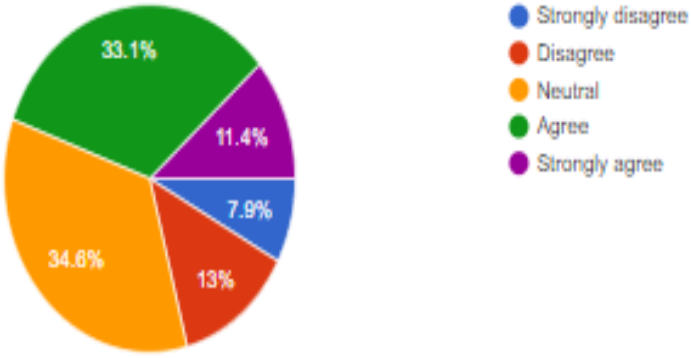

MMA(Mixed Martial Arts) Helps to Improves Physical Toughness?

254 responses



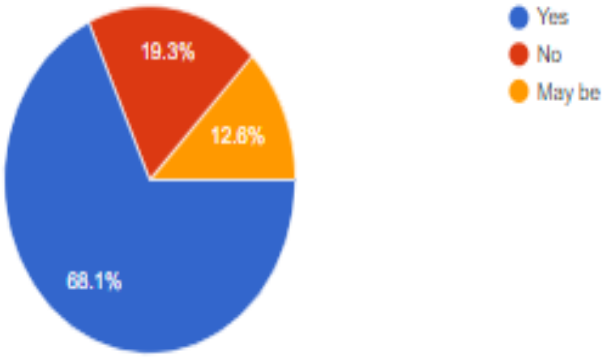
MMA(Mixed Martial Arts) Helps to Stress Relief and Improve Sleep?

254 responses




MMA(Mixed Martial Arts) Helps to Lose weight?

254 responses



# Data Description:

| | |
|---|---|
| Name | Text |
| What aspects of MMA(Mixed Martial Arts) do you find most entertaining? | Text |
| At What Age did you first hear about MMA(Mixed Martial Arts)? | Text |
| MMA(Mixed Martial Arts) Help to Improve confidence? | Text |
| MMA(Mixed Martial Arts) Helps to Improves Physical Toughness? | Text |
| MMA(Mixed Martial Arts) Helps to Improves Mental Toughness and Resilience? | Text |
| MMA(Mixed Martial Arts) Helps to Improve aerobic and anaerobic conditioning? | Bool |
| MMA(Mixed Martial Arts) leads to fitness . Do You agree? | Text |
| MMA(Mixed Martial Arts) Helps to Improve Overall Body Coordination and Proprioception? | Text |
| MMA(Mixed Martial Arts) Helps to Stress Relief and Improve Sleep? | Text |
| MMA(Mixed Martial Arts) Helps to Lose weight? | Text |

# DATASET

For this analysis, we will be using data collected via Google form. The dataset contains the data related to the Martial Arts.

```
gb1.head(10)
```

| | Timestamp | Name | Most_entertaining | Age | Improve_confidence | Physical_Toughness | Mental_Toughness_and_Resilience | Aerobic_and_Anaerobic_conditioning | Fitness |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2021/03/02 9:28:07 PM GMT+5:30 | chinmay | Kung Fu;Capoeira;Karate;Kalari | Below 18yrs | Yes | Agree | Strongly disagree | True | Yes |
| 1 | 2021/03/02 9:36:19 PM GMT+5:30 | Simran mahadik | Taekwondo | Above 18yrs | Yes | Agree | Agree | True | Yes |
| 2 | 2021/03/03 5:08:28 PM GMT+5:30 | Anuja | Taekwondo;Karate | Below 15yrs | Yes | Agree | Neutral | True | Yes |
| 3 | 2021/03/03 6:04:48 PM GMT+5:30 | Sonali more | Karate | Below 15yrs | Yes | Agree | Agree | True | Yes |
| 4 | 2021/03/04 4:24:27 PM GMT+5:30 | Uma Jagkar | Kung Fu;Karate | Below 15yrs | Yes | Agree | Agree | True | Yes |
| 5 | 2021/03/04 4:26:35 PM GMT+5:30 | Neha Chauhan | Kung Fu;Karate;Kalari | Below 12yrs | Yes | Agree | Strongly agree | True | Yes |
| 6 | 2021/03/04 4:26:56 PM GMT+5:30 | Vishal Lanke | Taekwondo | Below 12yrs | Yes | Can't Say | Agree | True | Maybe |
| 7 | 2021/03/04 4:28:40 | Manisha | Taekwondo;Kung Fu;Capoeira;Karate;Kalari;Muay | Below | Yes | Disagree | Strongly disagree | False | No |



✓ 0s completed at 8:22 PM

# Data pre-processing:

Data pre-processing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model.

```
gb1
```

| | Timestamp | Name | Most_entertaining | Age | Improve_confidence | Physical_Toughness | Mental_Toughness_and_Resilience | Aerobic_and_Anaerobic_conditioning | Fitness |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2021/03/02 9:28:07 PM GMT+5:30 | chinmay | Kung Fu;Capoeira;Karate;Kalari | Below 18yrs | Yes | Agree | Strongly disagree | True | Yes |
| 1 | 2021/03/02 9:36:19 PM GMT+5:30 | Simran mahadik | Taekwondo | Above 18yrs | Yes | Agree | Agree | True | Yes |
| 2 | 2021/03/03 5:08:28 PM GMT+5:30 | Anuja | Taekwondo;Karate | Below 15yrs | Yes | Agree | Neutral | True | Yes |
| 3 | 2021/03/03 6:04:48 PM GMT+5:30 | Sonali more | Karate | Below 15yrs | Yes | Agree | Agree | True | Yes |
| 4 | 2021/03/04 4:24:27 PM GMT+5:30 | Uma Jagkar | Kung Fu;Karate | Below 15yrs | Yes | Agree | Agree | True | Yes |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 249 | 2021/03/27 11:01:37 PM GMT+5:30 | Saleha Poojary | Kung Fu;Capoeira;Kalari | Below 15yrs | Yes | Disagree | Neutral | True | No |
| 250 | 2021/03/27 11:02:08 PM GMT+5:30 | Anita sevale | Kung Fu;Capoeira;Muay Thai;Wushu | Below 18yrs | Yes | Disagree | Disagree | True | No |



## Data Cleaning

```
gb1.isnull().sum()
```

```
Timestamp                                  0
Name                                       0
Most_entertaining                          0
Age                                        0
Improve_confidence                         0
Physical_Toughness                         0
Mental_Toughness_and_Resilience            0
Aerobic_and_Anaerobic_conditioning         0
Fitness                                    0
Overall_Body_Coordination_and_Proprioception  0
Stress_Relief_and_Improve_Sleep            0
Lose_weight                                0
dtype: int64
```

## Converting categorical data into integer:

```
gb1.Aerobic_and_Anaerobic_conditioning= gb1.Aerobic_and_Anaerobic_conditioning.astype('int')
gb1.dtypes
```

```
Timestamp                                  object
Name                                       object
Most_entertaining                          object
Age                                        object
Improve_confidence                         object
Physical_Toughness                         object
Mental_Toughness_and_Resilience            object
Aerobic_and_Anaerobic_conditioning          int64
Fitness                                    object
Overall_Body_Coordination_and_Proprioception object
Stress_Relief_and_Improve_Sleep            object
Lose_weight                                object
dtype: object
```

```
one_hot_data = pd.get_dummies(gb1[['Most_entertaining']])
one_hot_data
```

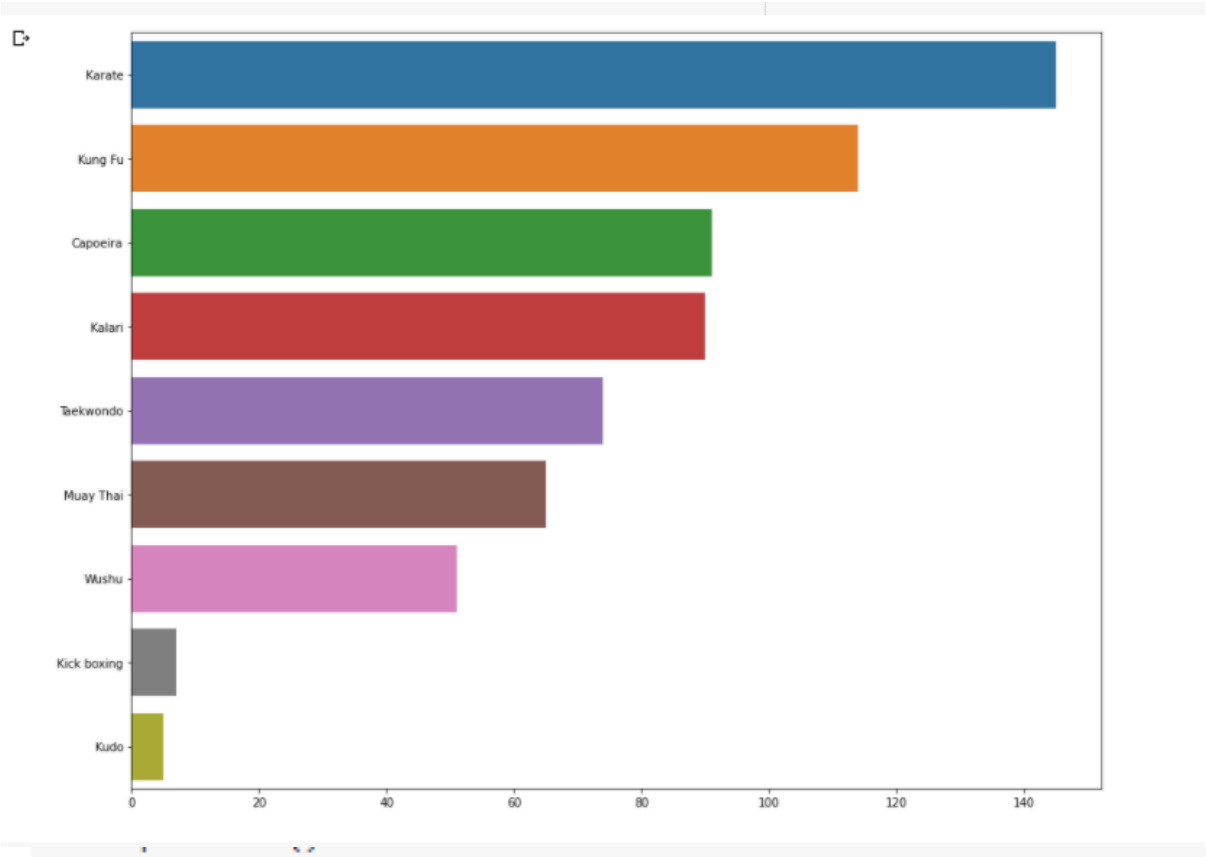
| | Most_entertaining_Capoeira | Most_entertaining_Capoeira;Kalari | Most_entertaining_Capoeira;Kalari;Muay Thai | Most_entertaining_Capoeira;Kalari;Wushu |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 |
| ... | ... | ... | ... | ... |
| 249 | 0 | 0 | 0 | 0 |
| 250 | 0 | 0 | 0 | 0 |
| 251 | 0 | 0 | 0 | 0 |
| 252 | 0 | 0 | 0 | 0 |
| 253 | 0 | 0 | 0 | 0 |

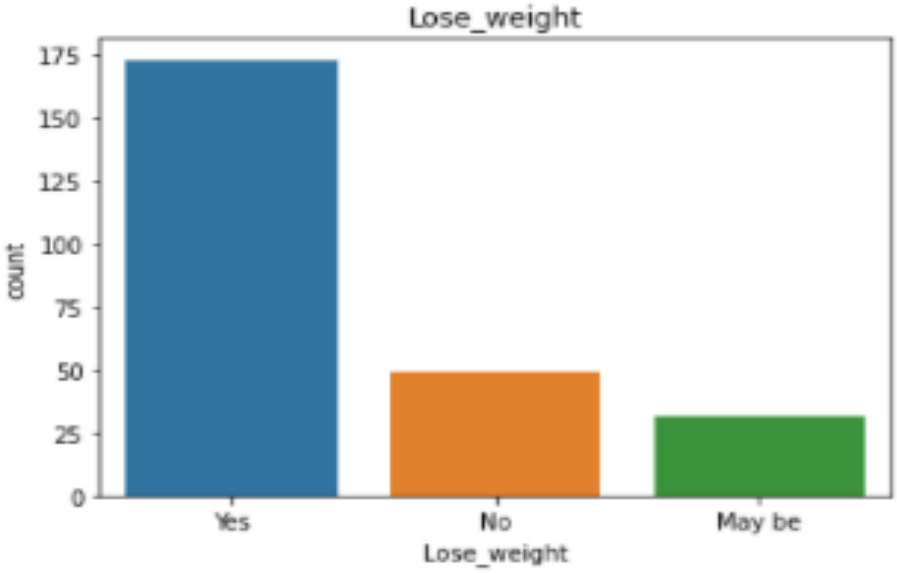
254 rows × 80 columns

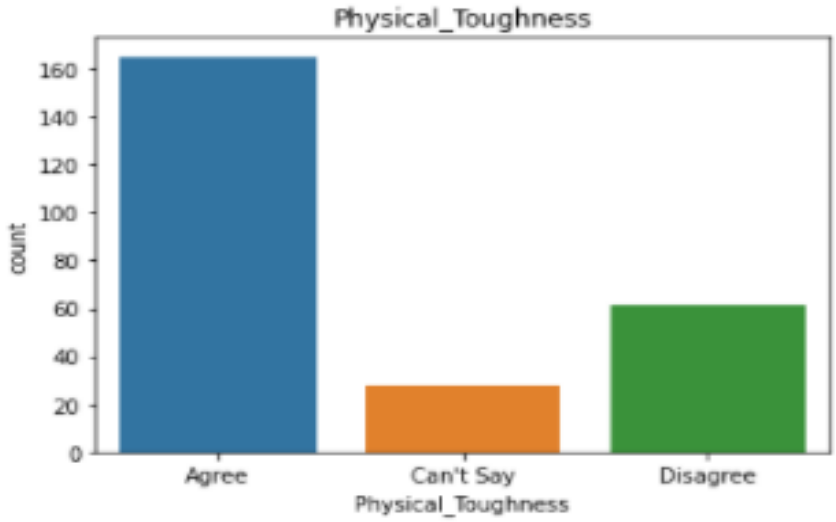
```
[ ] gb1.head(10)
```

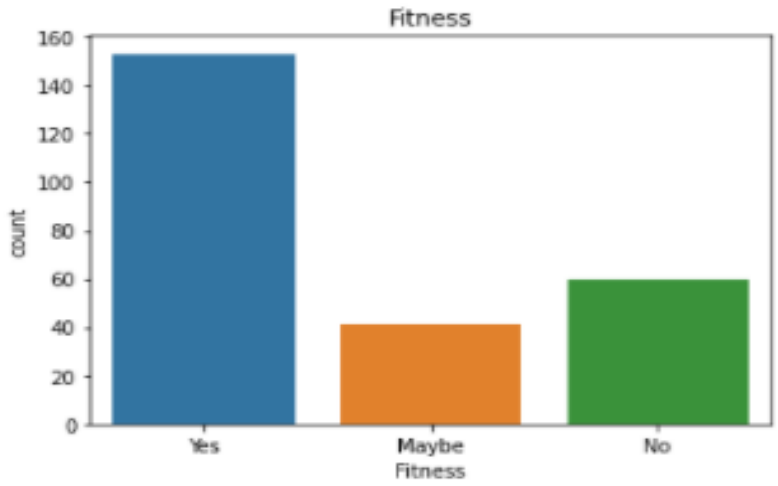
| | Timestamp | Name | Most_entertaining | Age | Improve_confidence | Physical_Toughness | Mental_Toughness_and_Resilience | Aerobic_and_Anaerobic_conditioning | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 2021/03/02 9:28:07 PM GMT+5:30 | chinmay | Kung Fu;Capoeira;Karate;Kalari | Below 18yrs | Yes | Agree | Strongly disagree | 1 | |
| 1 | 2021/03/02 9:36:19 PM GMT+5:30 | Simran mahadik | Taekwondo | Above 18yrs | Yes | Agree | Agree | 1 | |
| 2 | 2021/03/03 5:08:28 PM GMT+5:30 | Anuja | Taekwondo;Karate | Below 15yrs | Yes | Agree | Neutral | 1 | |
| 3 | 2021/03/03 6:04:48 PM GMT+5:30 | Sonali more | Karate | Below 15yrs | Yes | Agree | Agree | 1 | |
| 4 | 2021/03/04 4:24:27 PM GMT+5:30 | Uma Jagkar | Kung Fu;Karate | Below 15yrs | Yes | Agree | Agree | 1 | |
| 5 | 2021/03/04 4:26:35 PM GMT+5:30 | Neha Chauhan | Kung Fu;Karate;Kalari | Below 12yrs | Yes | Agree | Strongly agree | 1 | |
| 6 | 2021/03/04 4:26:56 PM GMT+5:30 | Vishal Lanke | Taekwondo | Below 12yrs | Yes | Can't Say | Agree | 1 | |

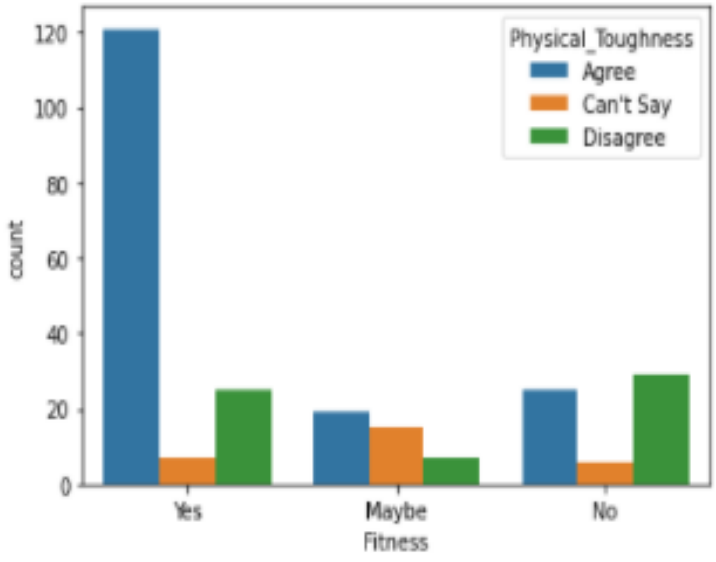
# DATA ANALYSIS

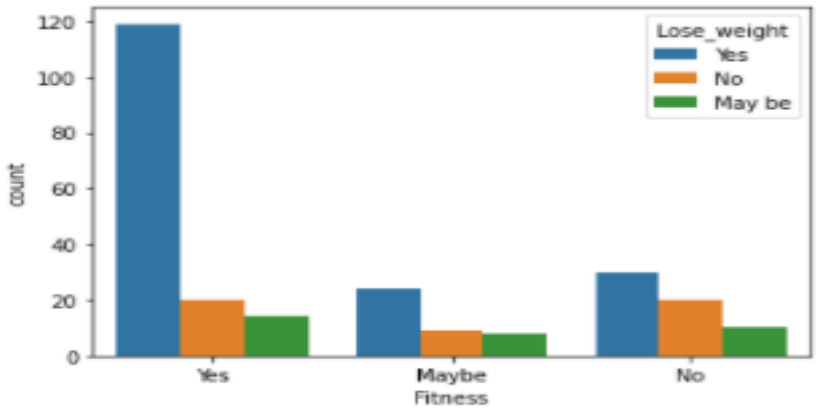


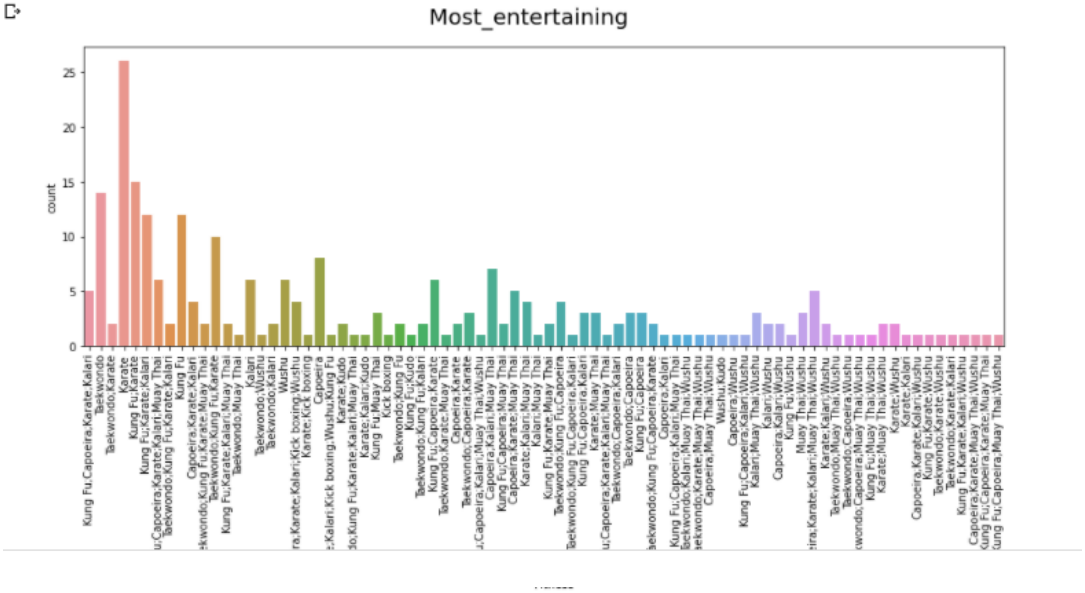



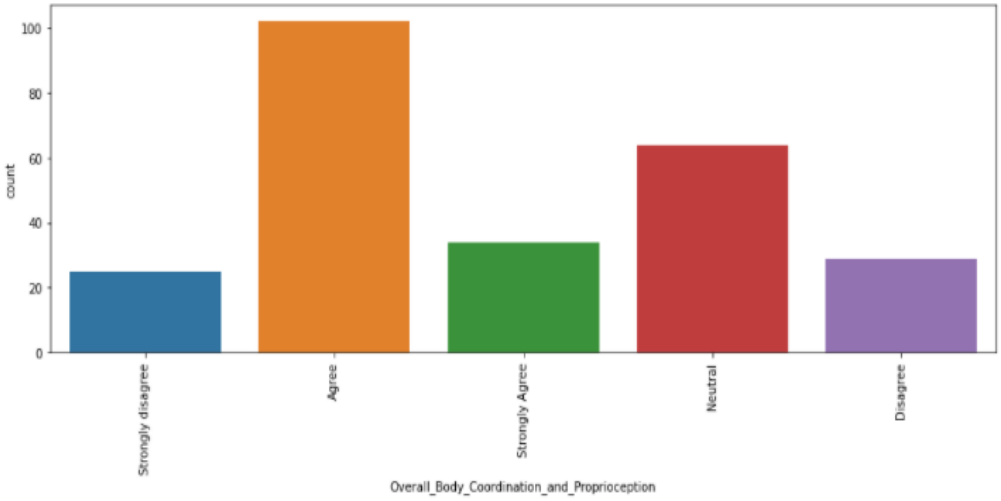

Physical_Toughness
count
160
140
120
100
80
60
40
20
0
Agree
Can't Say
Disagree
Physical_Toughness

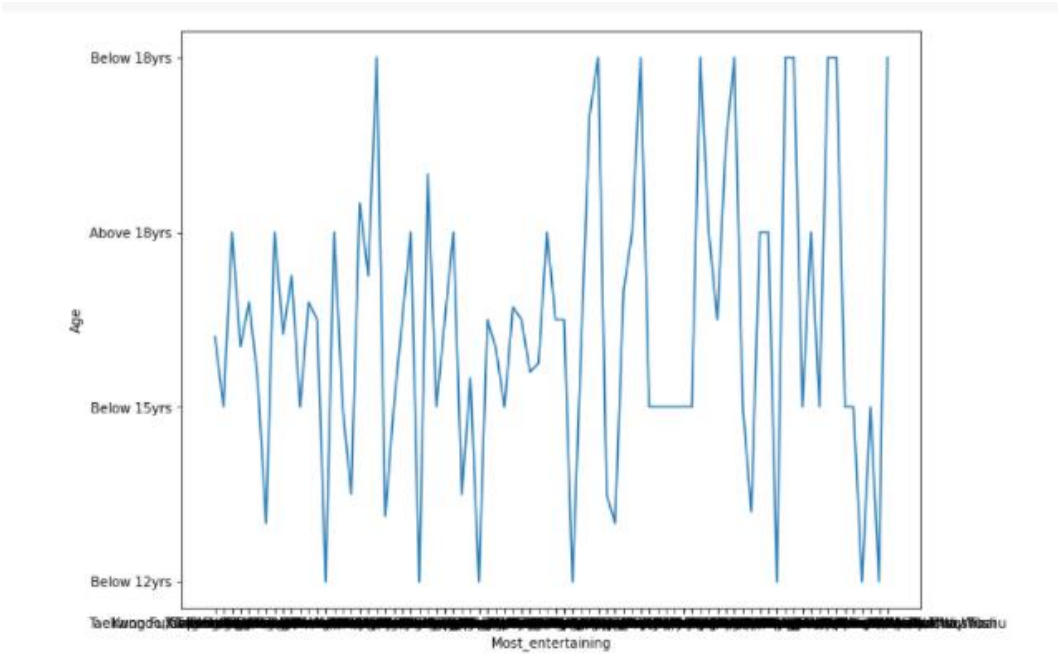

Fitness
count
160
140
120
100
80
60
40
20
0
Yes
Maybe
No
Fitness


Physical_Toughness
Agree
Can't Say
Disagree
count
120
100
80
60
40
20
0
Yes
Maybe
No
Fitness

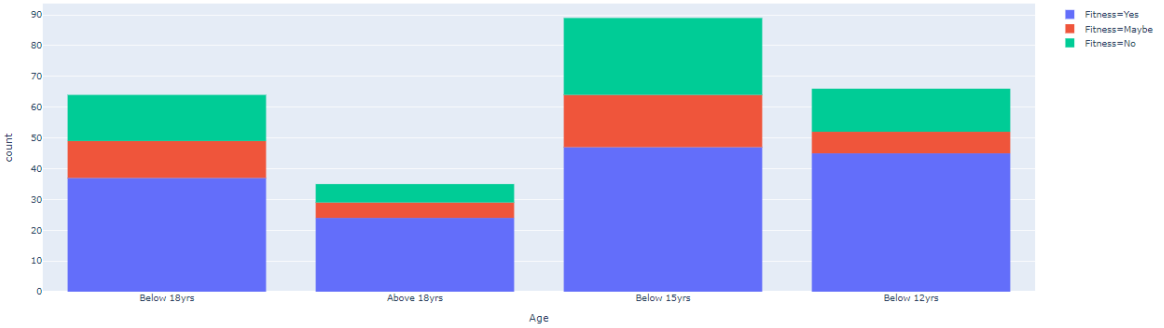

Lose_weight
Yes
No
May be
count
Yes
Maybe
No
Fitness


Most_entertaining
count

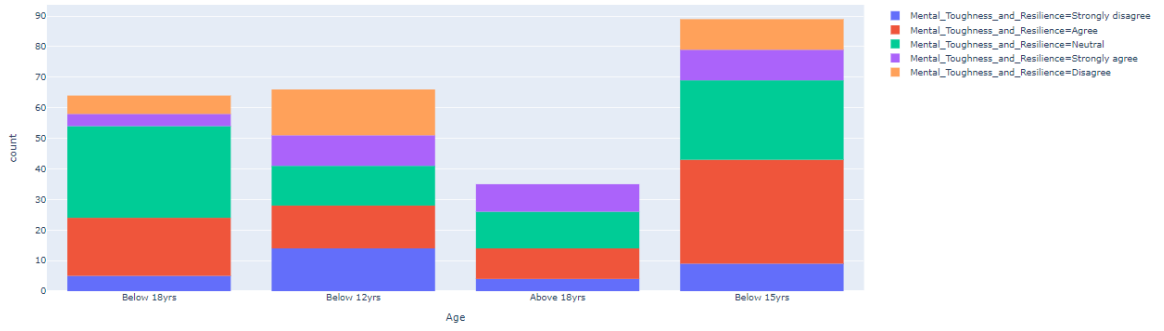

Overall_Body_Coordination_and_Proprioception
count
Strongly disagree
Agree
Strongly Agree
Neutral
Disagree
Overall_Body_Coordination_and_Proprioception

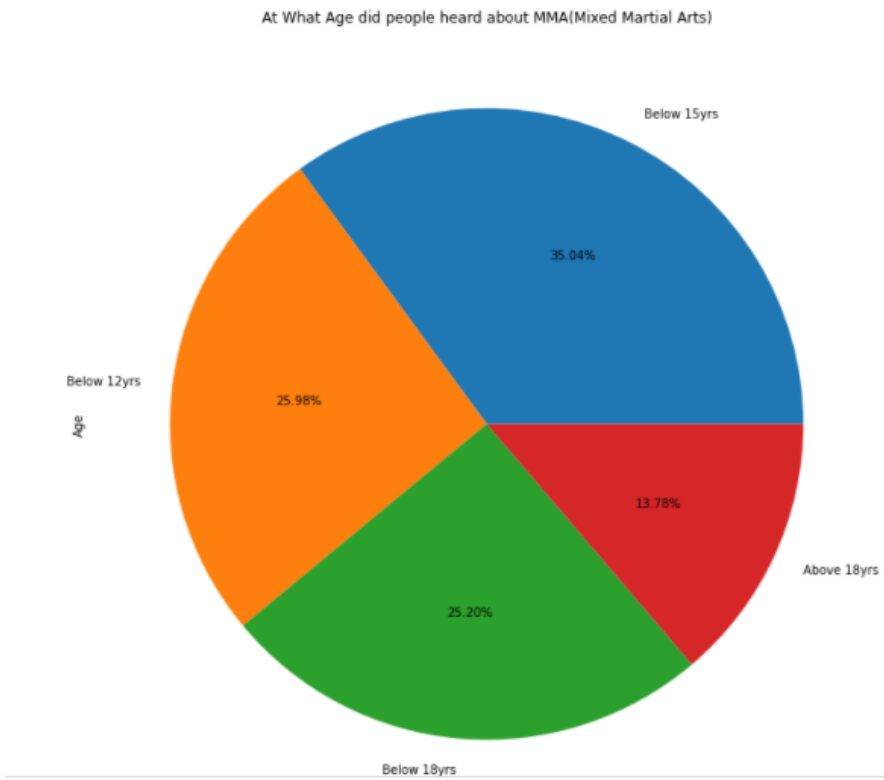


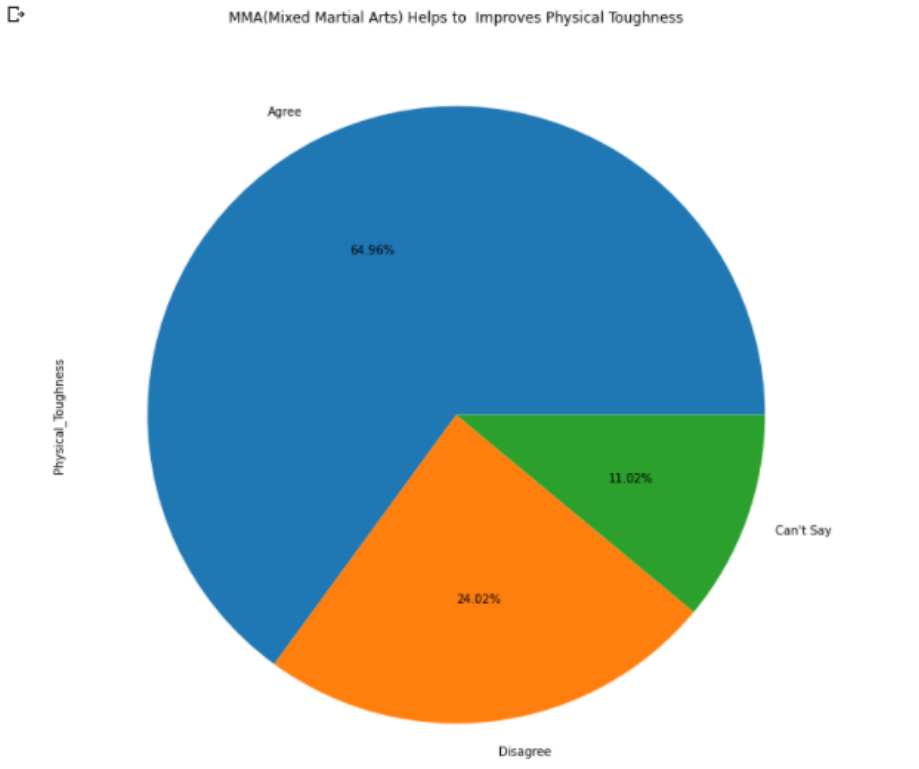

```
[ ]  px.histogram(gb1, x='Age', color='Fitness')
```



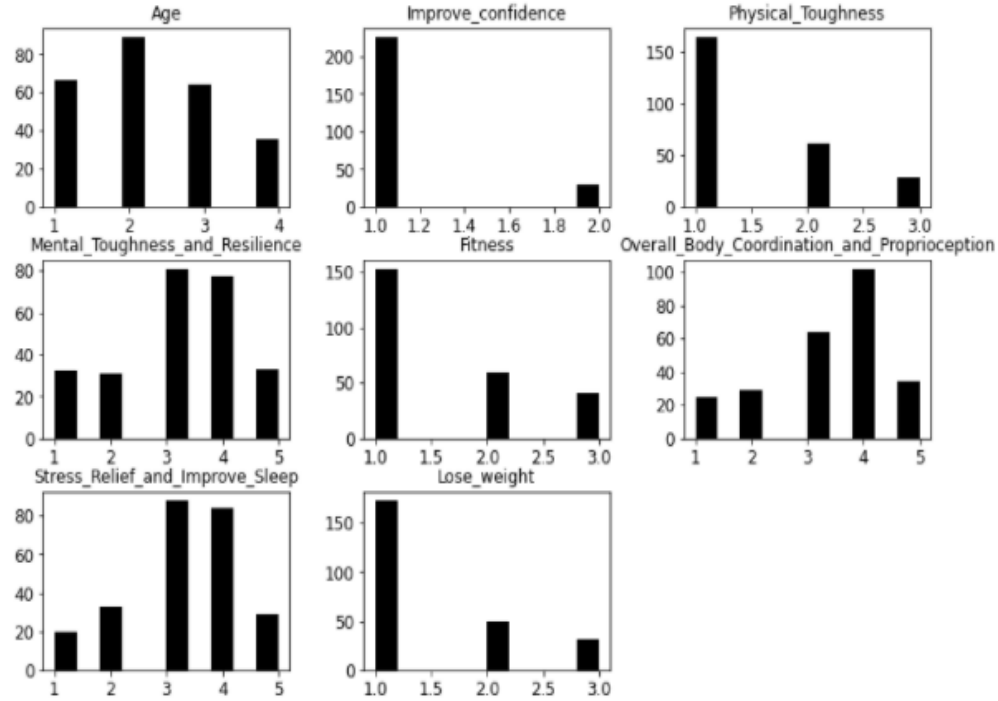

```
[ ]  px.histogram(gb1, x='Age', color='Mental_Toughness_and_Resilience')
```

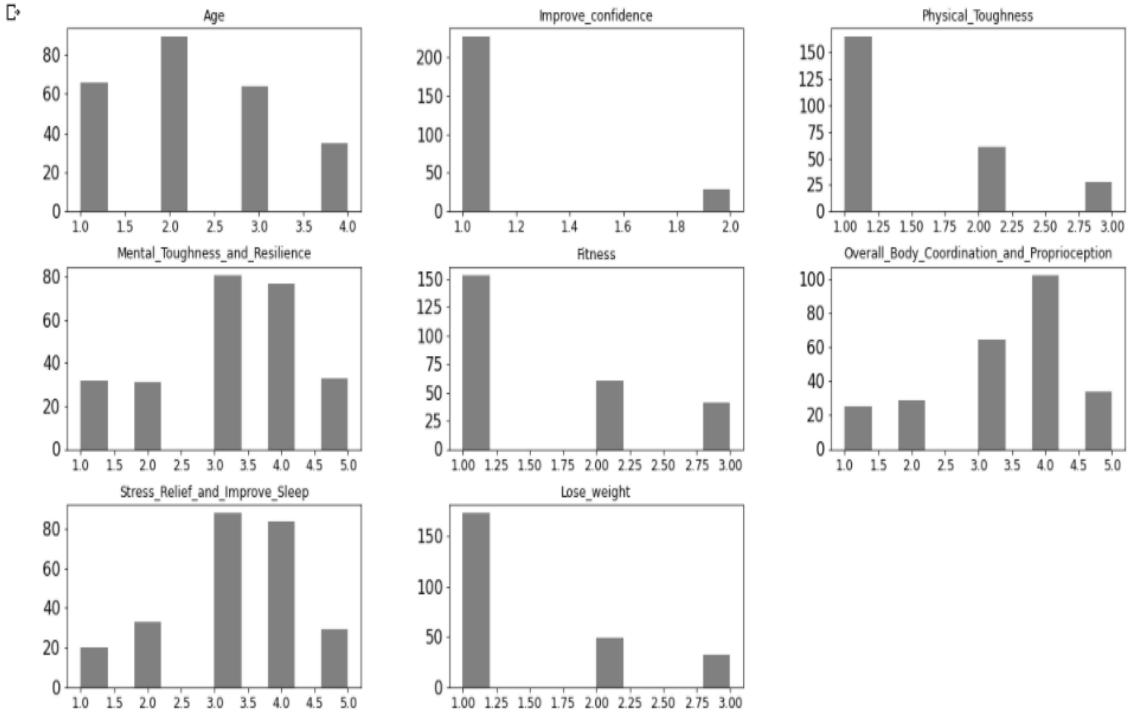


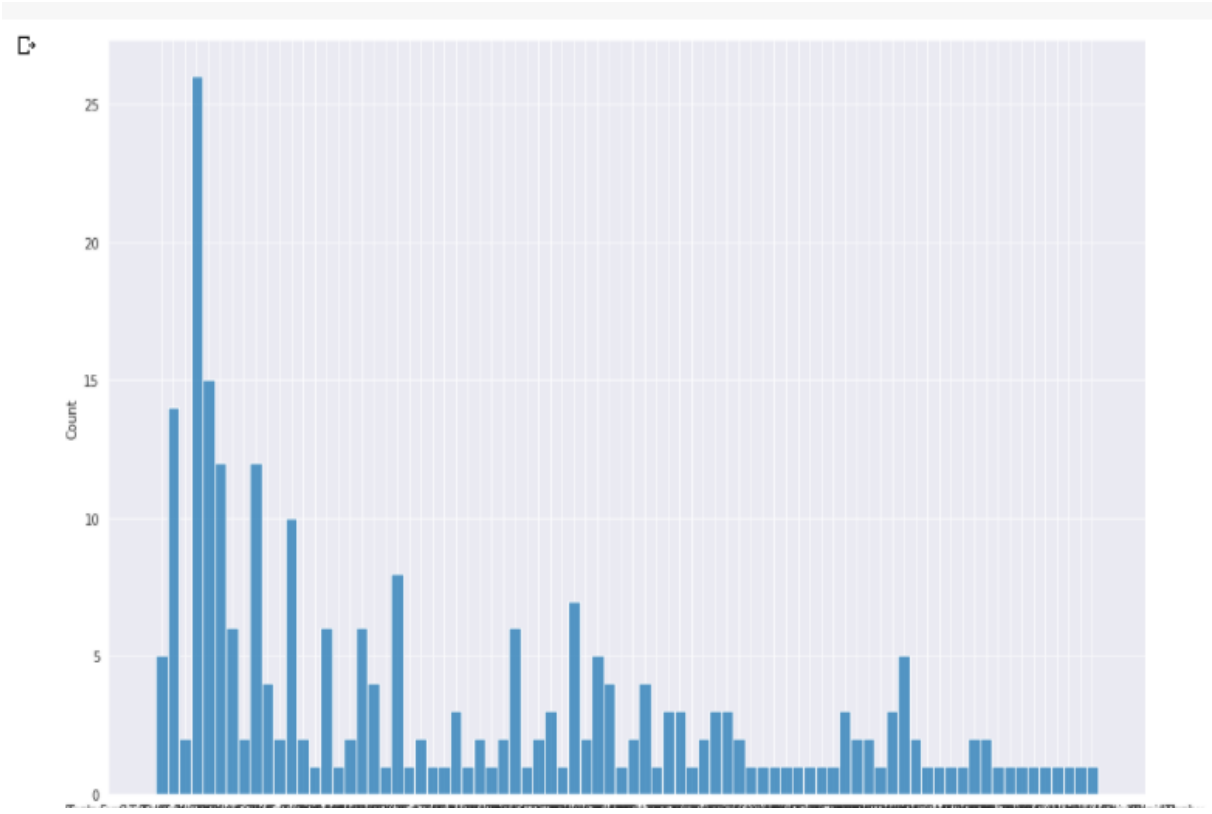

At What Age did people heard about MMA(Mixed Martial Arts)
Below 15yrs
35.04%
Below 12yrs
25.98%
Age
13.78%
Above 18yrs
25.20%
Below 18yrs

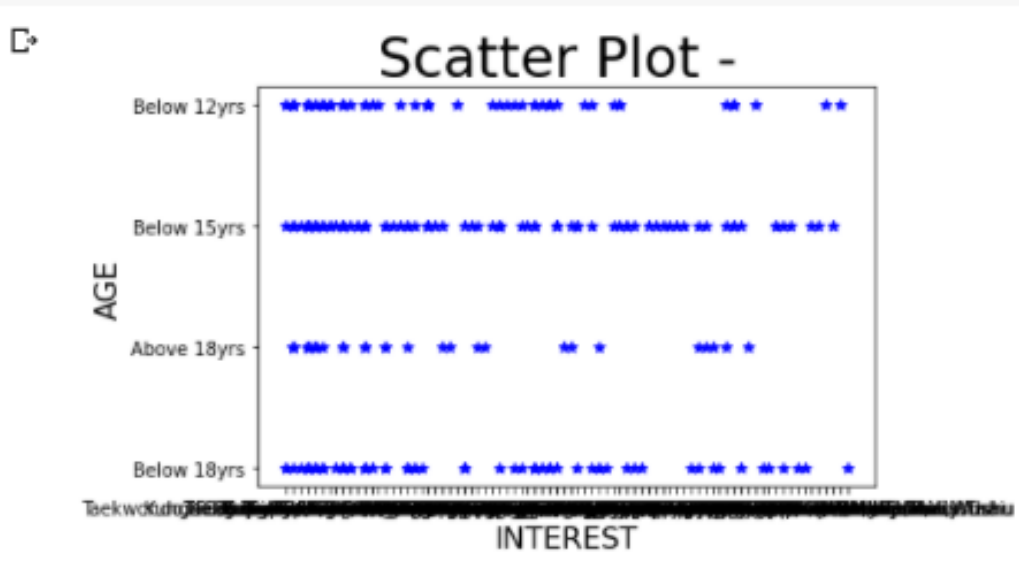

MMA(Mixed Martial Arts) Helps to Improves Physical Toughness
Agree
64.96%
Physical_Toughness
11.02%
Can't Say
24.02%
Disagree

```
Text(0, 0.5, 'Most_entertaining')
```




25
20
15
10
5
0
Count


Scatter Plot -
Below 12yrs
Below 15yrs
Above 18yrs
Below 18yrs
AGE
INTEREST

# Data Classification

## MACHINE LEARNING MODELS

## Random Forest Classifier:

Random forest builds multiple decision trees and merges them together to get a more accurate and stable prediction. One big advantage of random forest is, that it can be used for both classification and regression problems, which form the majority of current machine learning systems. I will talk about random forest in classification, since classification is sometimes considered the building block of machine learning.

```
[64] rfc.score(X_train, y_train)*100

     70.44334975369459
```

# Decision Tree Classifier:

Decision Tree Classifier is a simple Machine Learning model that is used in classification problems. It is one of the simplest Machine Learning models used in classifications, yet done properly and with good training data, it can be incredibly effective in solving some tasks. Decision Trees Classifiers are a type of Supervised Machine Learning meaning we build a model, we feed training data matched with correct outputs and then we let the model learn from these patterns. Then we give our model new data that it hasn't seen before so that we can see how it performs

```
[49] y_preds=dct.predict(X_test)
```

```
[50] dct.score(X_test, y_test)*100
```

```
62.74509803921568
```

# CONCLUSION

From the analysis of dataset and visualization of the result we can see various patterns that exists among the different factors related to martial arts in dataset which help us to get better understanding of the data. After martial arts data

Through the analysis and visualization carried out in this project, I reach to a conclusion that:

- Most of the people don’t have idea about the various forms of martial arts.

- More than 50% of people join martial to reduce weight and improve physical fitness.
- Less than 45% people believe martial arts can help to improves mental toughness.
- But, More than 50% people believe martial arts not only help to improves confidence on player but also relief stress and improve sleep.

# FUTURE SCOPE

- When it comes to something as complex, varied, and rich as the world of martial arts, we can at least make some educated guesses based on the evolution we're currently witnessing.
- Martial arts-influenced self-defence classes will continue to gain popularity. Martial arts supplies and gear will continue to adapt to help athletes be their best selves on the mat and in the ring.
- Mixed martial arts will continue to grow into its own discipline, as opposed to a mix of techniques from many different arts.
- Karate will enjoy its Olympic debut at the 2020 games. And martial artists all over the world will continue to improve themselves and their art.

# References :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