

# Informatics for Engineering

Management

EM 624 Fall 2019 – Final Project

**Crossfit Athlete Performance Analysis**

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## Research Questions:

This project is to analyze the crossfit athlete performance on various workout. Crossfit events are to text the fitness level and ability to perform better at different sports. Workout comprises of different activity like Gymnastic, Olympic Weightlifting, swimming, high intense cardio etc. Data of one competition i.e. crossfit opens 2018 is analyzed. We choose 5 main factors for the analysis. 1st Aerobic, 2nd Anaerobic, 3rd Olympic lifting, 4th strength and 5th gymnastic. Thus, we have stated the questions below in order to answer the question.

1. Which athlete is better at particular skill?
2. What improvement have to be done compare to other athlete?
3. Did I improved my skills compare to previous year?
4. What are the chances that I can win in upcoming events?

## Research Motivation:

Crossfit is the only affiliate which are allowed to text an individual fitness level and give title as fittest man or women on earth or in a particular country. Crossfit motivates people to perform functional workout which can help individual to stay fit and able to perform daily task easily. The workout they design directly reflect the movement of day to day life. Hence, can improve and make our lifestyle healthy. Crossfit workout has reduce obese people by 10% in entire world. I participated in crossfit 2019 opens and I was 70th fittest man in India, since childhood I was good at sports. This was the main reason and motivation.

In addition to this the results are out on website in table form an Image is attached below. All the players and their scores are listed in table format in numeric values, this makes it very difficult for players to analyze and understand their performance compare to others.

Hence my output (Result) could be useful.

A screenshot of a cell phone

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## Dataset Description:

I have obtained 1 Data set:

The file was in csv format. This data set contains all Man who participated for Reebok Crossfit opens 2018. It has all the details of athletes their individual ranking for each workout. It has 4796 individual players in my data set having each and every detail of individual.

It had athlete details like height, age, weight, place from they performed the workout, country they belong, all 5 workout scores, timing, rank, etc.

## Data Preparation:

The Data Sources allow the user to download the file in a CSV format the data set consist of only ranks and timing, hence it was not a perfect data to perform analysis. Some row had combination of timing and reps of athlete. Therefore, athlete percentile was manually copy pasted in csv file. Using that percentile entire analysis was performed.

## Methodology:

We use python for doing Data Cleaning, Data analysis and Data Visualization. First, we ask user to enter name of two players they want to compare. Second, we extract entered details of both players. Third, we extracted percentile of both athletes. Fourth, we created radar chart. Fifth, we assigned predefined skills to the radar plot i.e. gymnastic, weightlifting, strength, aerobic, anerobic skill. Finally, plot is developed comparing two different athletes.

Each workout is analyzed and pre-defined which area it is more focused on.

Gymnastic- Basic gymnastic exercises like the pull-up, handstand hold, L-sit and even push-ups are some of the staple exercises in CrossFit**.**

Olympic weightlifting-Olympic weightlifting, often simply referred to as weightlifting, is an athletic discipline in the modern Olympic program in which the athlete attempts a maximum-weight single lift of a barbell loaded with weight plates.

Aerobic workout-Aerobic exercise is any type of cardiovascular conditioning. It can include activities like brisk walking, swimming, running, or cycling. You probably know it as “cardio.” By definition, aerobic exercise means “with oxygen.” Your breathing and heart rate will increase during aerobic activities.

Anaerobic exercise is defined as short duration, high intensity exercise lasting anywhere from merely seconds up to around two minutes. After two minutes, the body's aerobic system kicks in.

Example-

18.1 workout-

Complete as many rounds as possible in 20 minutes of:

* 8 toes-to-bars
* 10 dumbbell hang clean and jerks
* 14 / 12-cal. row

Men use 50-lb.  dumbbell  
 Women use 35-lb.  dumbbell

The above workout is more focused as Aerobic workout.

Similarly, 18.2 workout is considered to be more as Anaerobic workout

18.3 workout is considered to be more as Gymnastic workout

18.4 workout is considered to be more as Weightlifting workout

18.5 workout is considered to be more as Strength workout.

## Result:

Here the plot below is comparison of two athlete Salty Salazer and Brett Rosser. It is clear by plot that Brett is better that Salty in all the skills except from Anaerobic. Hence Brett needs to train himself more for Anerobic workouts. Salty needs to give more focus to improve all the skills but he is really good with Aerobic workout.

A close up of a logo

Description automatically generated

Similarly, the plot below it is very clear that Rod Stuart need to work more on Gymnastic and Strength skills when compare to Matteo Pinazzi’s performance.

A close up of a logo

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## Reference:

Data set-

<https://raw.githubusercontent.com/raybellwaves/cfanalytics/master/Data/Men_Rx_2018.csv>

<https://games.crossfit.com/sanctionals>

<https://games.crossfit.com/leaderboard/open/2018?division=1&region=0&occupation=0&scaled=0&sort=0>