

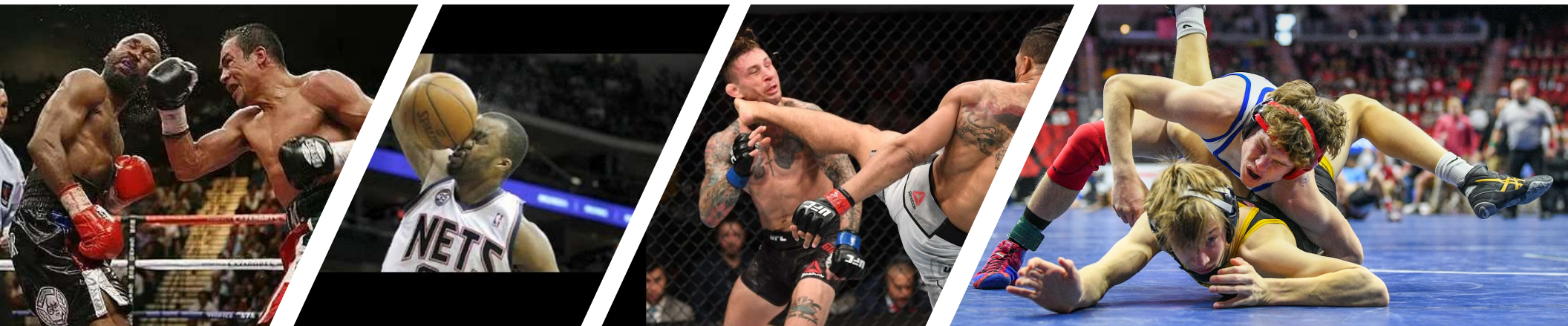


# Toughest Sports

**By: Blandon Lee**

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## Which Sports are Tough to Play?

After utilizing different resources (data.gov and data.world) to search for data to use for the term project I landed on Toughest Sports by Skill. Initially the search was meant to be on my favorite sports (MMA, Boxing, and Football), but with the amount of information in this one dataset it made the decision to use it easy. The data used provides 13 variables that are measured across 60 different sports.



# Statistical Questions/Hypothesis

- ❖ Does strength of an athlete play into a sports consideration for being toughest to play?
- ❖ What attributes are considered the most important in a sport being labeled as tough to play?
- ❖ What attributes are the least desirable to the overall score for a sport?
- ❖ Can a single attribute influence the overall ranking? Are multiple attributes necessary?
- ❖ Are the toughest sports to play the most popular?
- ❖ If profits were considered (variable) would the ranked toughest sports be the most profitable?
- ❖  $H_0$  – Popularity does not correlate with the toughness of a sport.
- ❖  $H_1$  – Popularity and sports toughness are correlated.



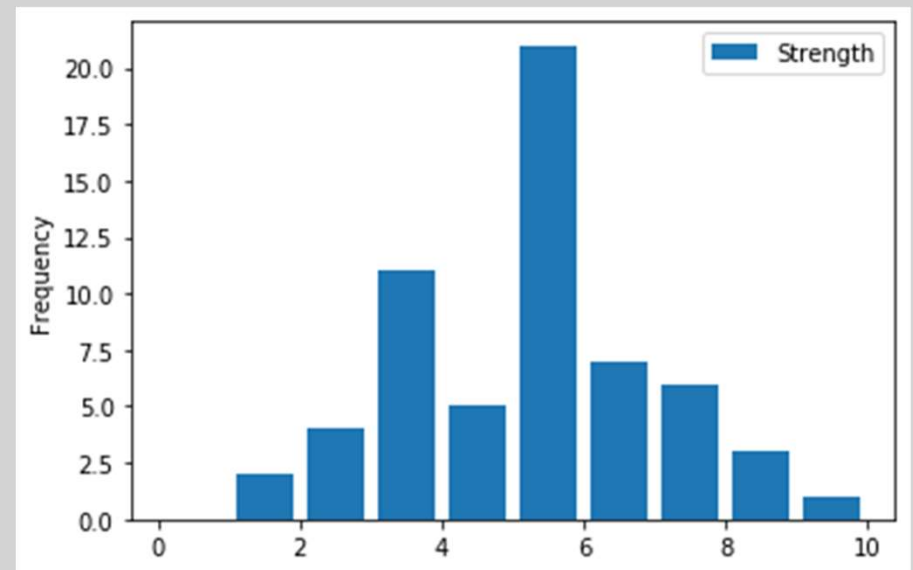
# Variables/Meaning

- ❖ Strength- Produce force
- ❖ Agility- Abrupt change in direction
- ❖ Analytical Aptitude- Evaluation of and reacting to situations
- ❖ Endurance- Perform for extended periods of time
- ❖ Flexibility- Contort muscle/joints over various ranges of motion
- ❖ Durability- Withstand punishment over time



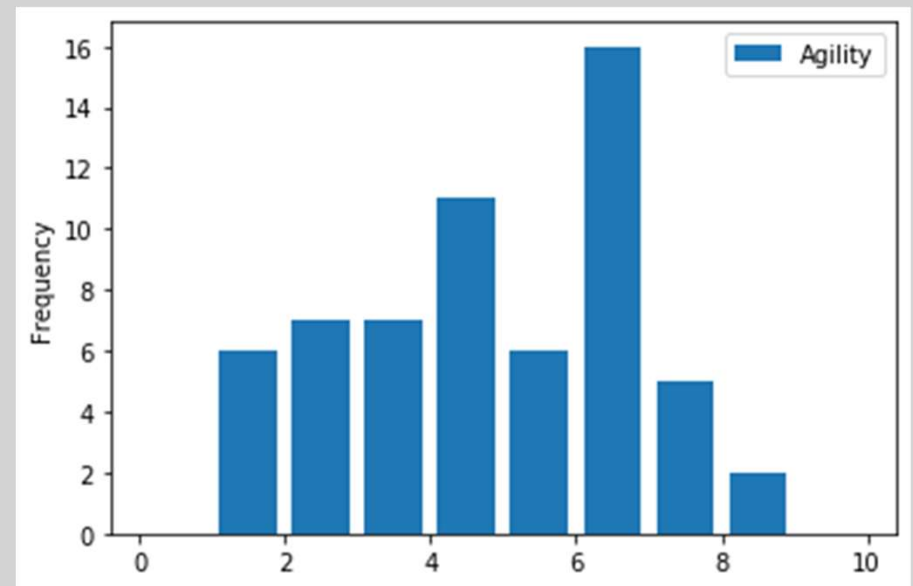
# Strength

This histogram indicates that strength has a normal distribution in the overall rankings. Closely follows a natural bell curve.



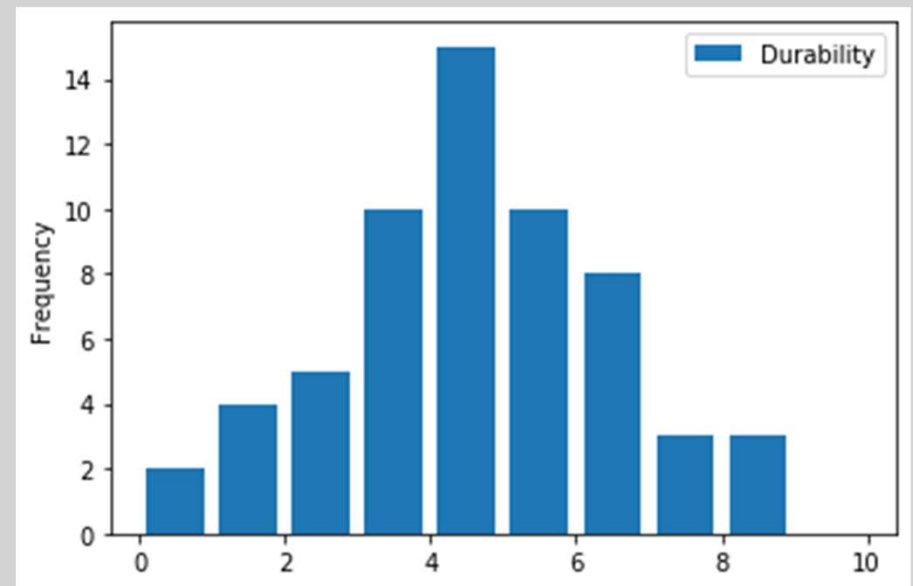
# Agility

This histogram for agility is all over. There is not really a pattern to its shape. Potentially the mode used could have an effect.



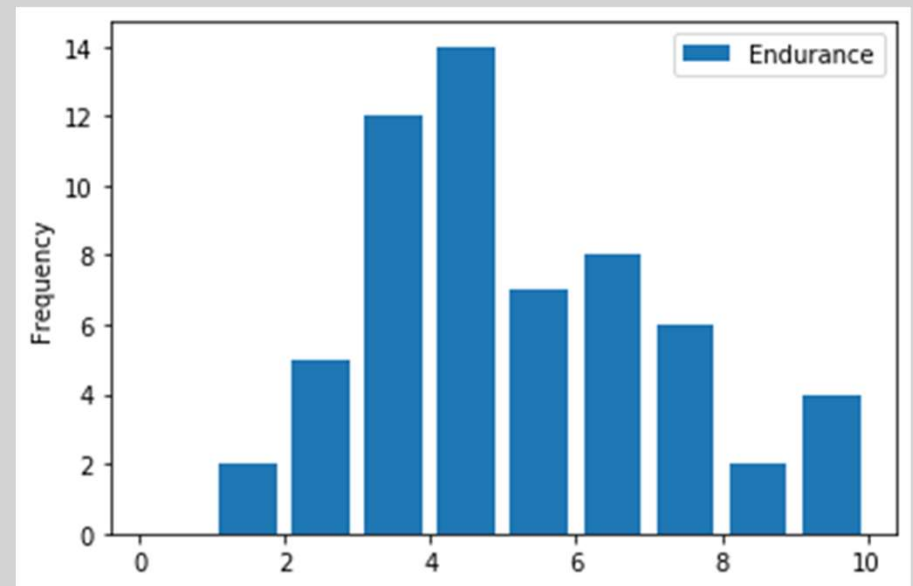
# Durability

Durability like Strength has a histogram shape that follows close to the natural bell curve indicating a normal distribution for the variable in the overall ranking.



# Endurance

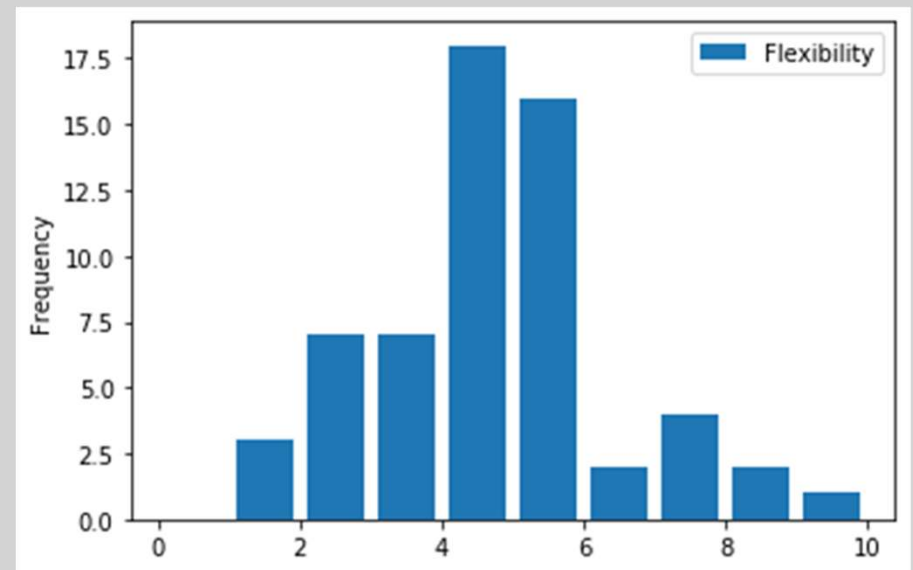
Endurance also follows close to a histograms natural bell curve indicating that there is significance for this variable in the overall ranking.





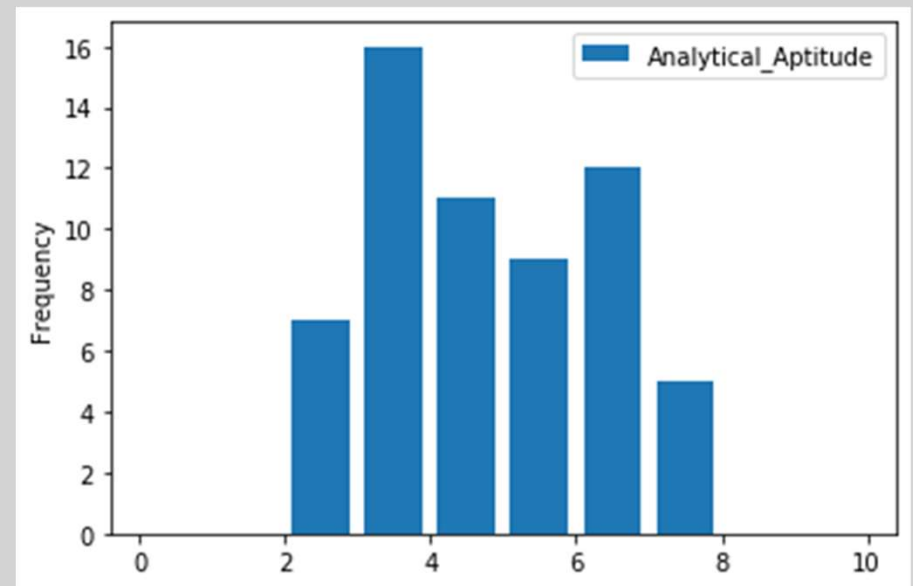
# Flexibility

Flexibility seems to be skewed to the left (Negative). There are outliers in the histogram, but most has skewed to the left.



# Analytical Aptitude

This histogram for analytical aptitude is all over. There is not really a pattern to its shape. Potentially the mode used could have an effect.



# Summary Statistics

- ❖ Mean
- ❖ Standard Deviation (Sd)
- ❖ Variance (spread)
- ❖ p-values by way of t-test of
- ❖ Variables
- ❖ Pearson's correlation
- ❖ Covariance



# Mean

❖ Popularity	215.581667
❖ Endurance	5.077667
❖ Strength	5.169
❖ Power	5.509167
❖ Speed	4.815
❖ Agility	4.765
❖ Flexibility	4.723167
❖ Nerve	4.6148833
❖ Durability	4.612833
❖ Hand-Eye Coordination	4.954833
❖ Analytical Aptitude	4.767333
❖ Total	48.98333
❖ Rank	30.4
❖ Popularity_Total	3.593028

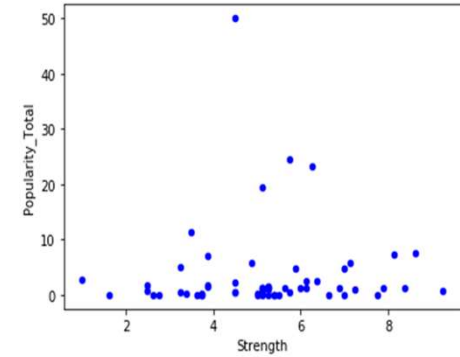
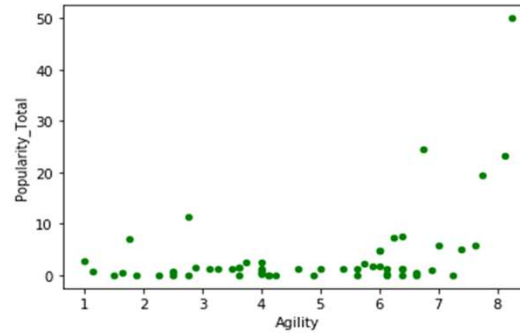
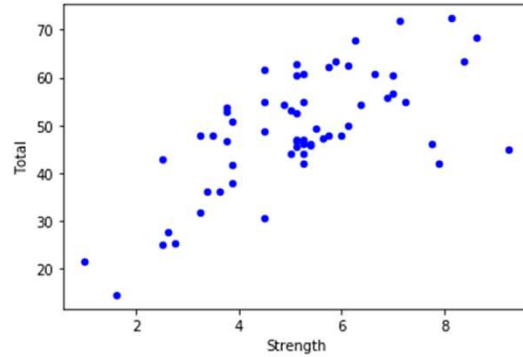


# Standard Deviation

❖ Popularity	477.298611
❖ Endurance	2.094217
❖ Strength	1.715357
❖ Power	1.980397
❖ Speed	2.266403
❖ Agility	1.927273
❖ Flexibility	1.704369
❖ Nerve	2.442645
❖ Durability	1.882102
❖ Hand-Eye Coordination	1.966328
❖ Analytical Aptitude	1.57683
❖ Total	12.170519
❖ Rank	17.473661
❖ Popularity_Total	7.954977

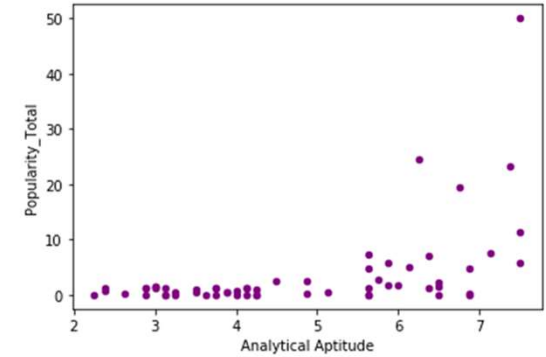
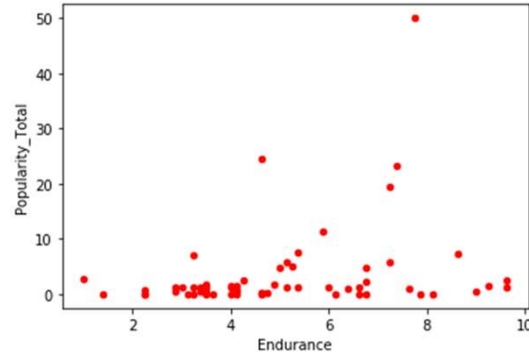
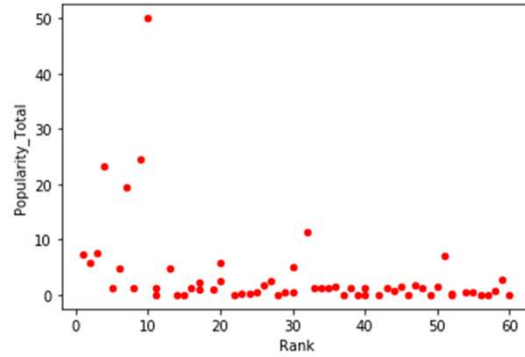






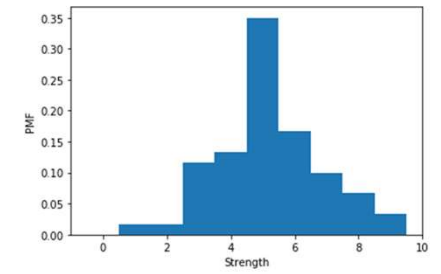
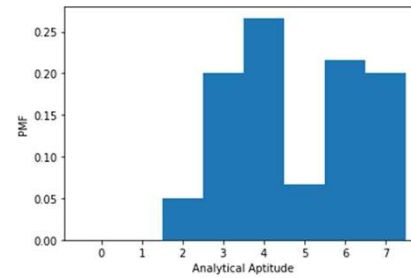
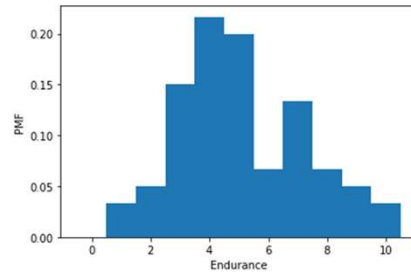
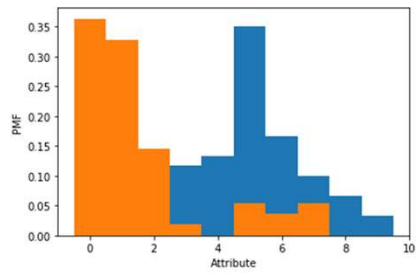
❖ Strength to Popularity_Total	0.042477757
❖ Agility to Popularity_Total	0.413586698
❖ Endurance to Popularity_Total	0.268119278
❖ Durability to Popularity_Total	0.279944714
❖ Analytical Aptitude to Popularity_Total	0.501463382
❖ Flexibility to Popularity_Total	0.017162246
❖ Total to Popularity_Total	0.367558603

Pearsons  
Correlation



❖ Strength to Popularity_Total	0.579635565
❖ Agility to Popularity_Total	6.34086822
❖ Endurance to Popularity_Total	4.466718484
❖ Durability to Popularity_Total	4.191354553
❖ Analytical Aptitude to Popularity_Total	6.290179115
❖ Flexibility to Popularity_Total	0.232689402
❖ Total to Popularity_Total	35.58562688

Covariance

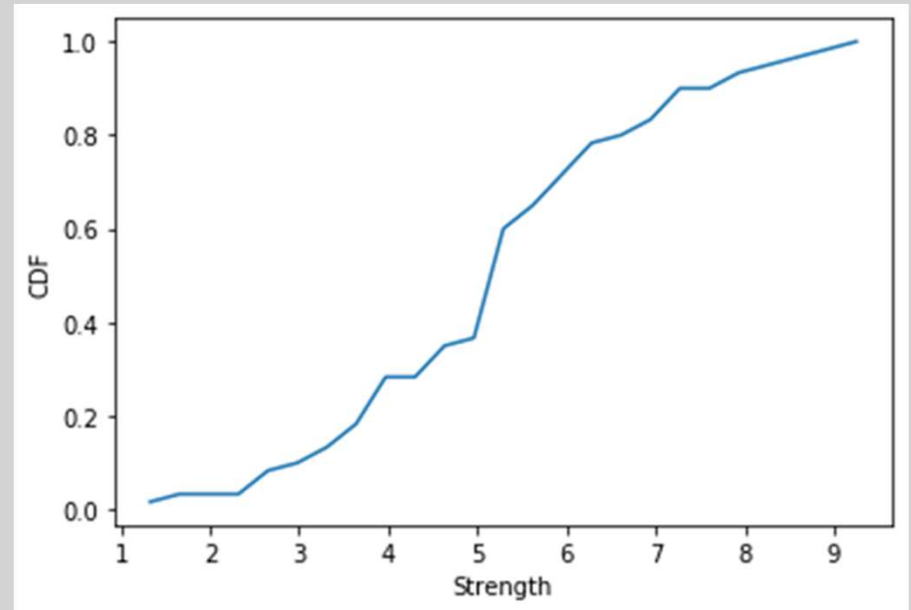


**Probability Mass Function**

PMF

# Cumulative Distribution Function

- ❖ 50% percentile: 5.190
- ❖ 90% percentile: 7.300
- ❖ 95% percentile: 8.143
- ❖ 100% percentile: 9.250



# Analytical Distribution

