Olympic vs Standard Scoring

Introduction

In competitive sports, such as sailing, many scoring systems have been used to try and create a fair scheme. In this investigation we will be making a comparison between the scoring system used in the 1948 Olympics system and a more standard scoring system for sailing. Both will be used to score 6 races containing of a fleet of 100 boats.

The standard system takes the position of the boat and uses this as a score. Once all races are complete they discard their worst score *(highest)* and total the rest to get their final score. This means lowest score would be first place and so on.

On the other hand, the Olympic system each score is calculated using

$$101 + 1000 \log A - 1000 \log N$$

Where N is their position, and A is the total number of boats in the race. In this case it is the highest score wins.

Difference in distribution

Running both scoring systems through a simulation of random generated numbers through *python* yields the following results. Taking note that for the standard system the low

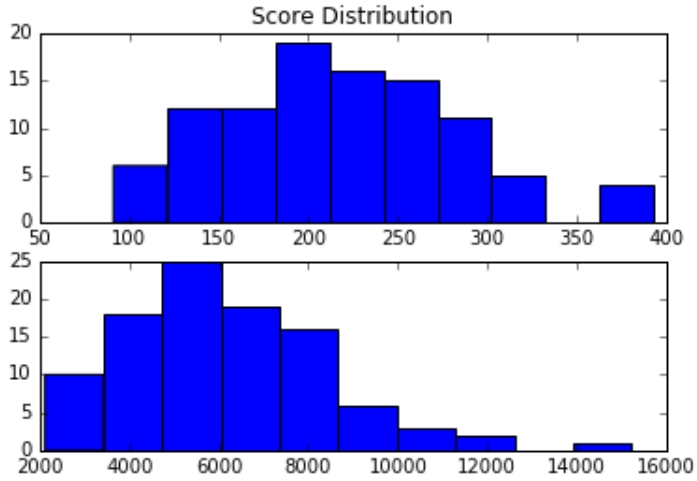

Figure 1: Distribution of the scores in both scoring systems

scores are the best, this displays a clear difference in how the scores distribute across the board.

Running several tests found that the scores for the standard system generally place in the middle of the range, however are the scores are generally more spread out then the Olympic

system. Majority of the scores in the Olympic system are below the half way point, with the range between scores getting steeper as you go up the board. The reasoning behind this is because of the equation used to calculate each score in the Olympic system. It is designed so that a value is calculated with $101 + 1000 \log A$ and then an amount is deducted from this by $1000 \log N$. As N is the position, the higher the position the greater is deducted. What's important is the logarithm. As you increase the variable given to the log, the difference between the returned results decreases.

Fairness

Taking this distribution into account in a real world environment, in the standard system, the difference between each position is theoretically equal. However in the Olympic system, the higher the position the greater the difference in worth between them.

What this means is, having one odd higher position then your average in a race is meet with greater reward. For example, a participate who generally scores very low on the board happens to achieve a position higher then their normal in one or two races. The amount of score they gain from this is greater in the Olympic system then in the standard.

However looking towards the top end of the board it is the opposite if a participate was to drop a position, as with the difference being greater in the Olympic system, they'll lose out on more score then the standard. As a result, this creates more competition at the top end, alongside giving the better participates a harder time to stay in lead.

Overall, it seems the Olympic system creates a better and fairer competitive environment, where even lower scorers have a chance at competing alongside more able participates.