

Is the Flying Monkey a faster race than the Labor Day 5K Classic?

Introduction

This observational study will examine data from two 5K races—the Labor Day 5K Classic and the Flying Monkey—to determine which one is a faster race.

The annual Labor Day 5K Classic (LD5KC) is held every year in Washington, PA. The LD5KC advertises itself as “The Fastest 5K Race in Western PA.” Hundreds of personal records have been set on this course. The LD5KC is a point-to-point race beginning at the stone pavilion in Washington Park (elevation 1252 feet) and ending at the Pathways of the SWPA building on Jefferson Avenue (elevation 1023 feet) for a drop in elevation of 229 feet.

However, some members of the Washington County Road Runners Club (WCRRC) claim that the Flying Monkey 5K (FM5K) is a faster course. This race begins at the Crown Center parking lot in Canonsburg, PA (elevation 1236 feet), and ends at 1000 Town Center Way (elevation 961 feet) for a drop in elevation of 275 feet.

Methodology

The population of this study includes all runners of the Labor Day 5K Classic or Flying Monkey 5K races. The sample will include runners who ran in either race in the year 2013. This is a representative sample of the population because it includes both competitive runners and non-competitive runners and walkers, as indicated by the race times. The observational unit is the runner, and the data to be used to compare the two races is the quantitative variable *time (sec)*.

To analyze the difference in finish times between the two races, this study looks at competitive runners, i.e., those runners who are trying to win or beat a record. This eliminates error related to participants who walk and yield possibly inconsistent finish times between the two races. Consequently, the units of interest, and those used in this study, are those who ranked in the top 50.

Data Exploration

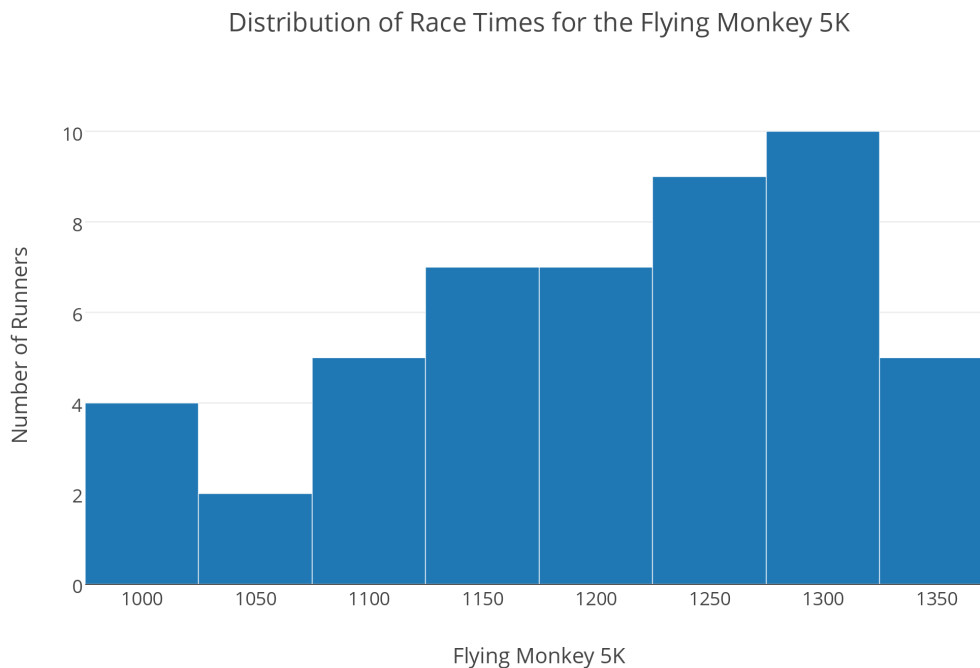


Figure 1 Distribution of Top 50 Race Times for Flying Monkey 5K

As Figure 1 illustrates, the distribution of race times (seconds) for the top 50 runners in the Flying Monkey 5K is slightly skewed to the left. The mean race time is 1145.68 seconds with a standard deviation of 83.55 seconds. The five number summary for this race, displayed in Table 1 on page 3, shows that the median, 1162.7, is approximately 17 seconds more than the mean. Because 17 seconds is small compared to the standard deviation of 83.55 seconds, either measure of center may be used to describe this distribution.

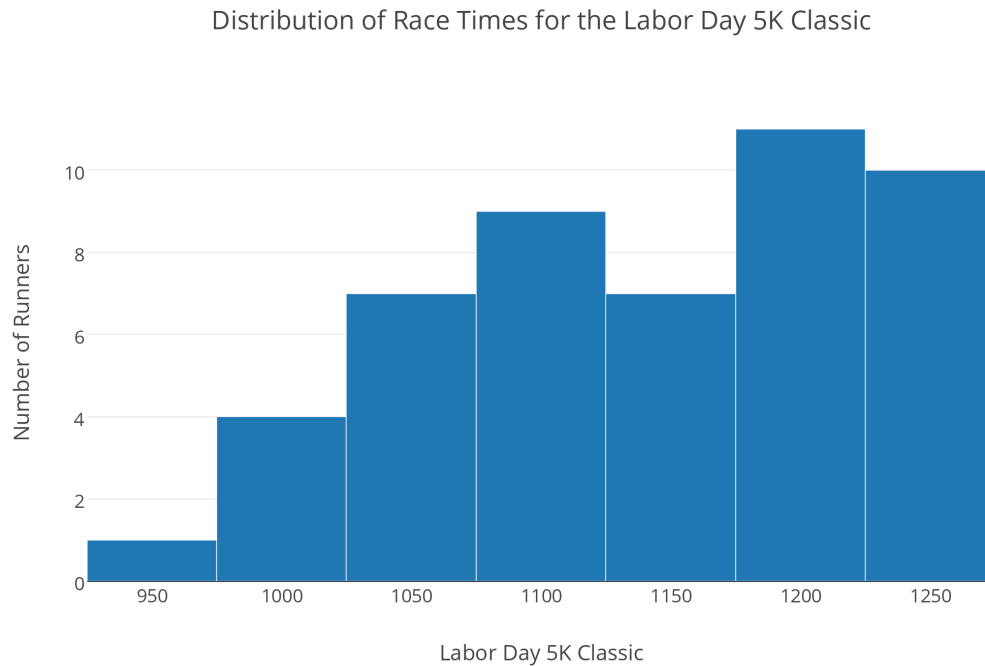


Figure 2 Distribution of Race Times for the Labor Day 5K Classic

As Figure 2 illustrates, the distribution of race times (seconds) for the top 50 runners in the Labor Day 5K Classic is slightly skewed to the left. The mean race time is 1207.02 seconds with a standard deviation of 97.87 seconds. The five number summary for this race, displayed in Table 1 on page 3, shows that the median, 1224.1, is approximately 17 seconds more than the mean. Because 17 seconds is small compared to the standard deviation of 97.87 seconds, either measure of center may be used to describe this distribution.

	Min	Q1	M	Q3	Max
Flying Monkey	950	1093.25	1162.7	1219.13	1259.8
Labor Day 5K Classic	1015.5	1137.08	1224.1	1286.73	1364.1

Table 1 Five Number Summary for the Flying Monkey 5K and the Labor Day 5K Classic

For this study, the mean is selected as the measure of center because the test to determine which race is the fastest compares the mean values from each race. However, the median with its corresponding five number summary and interquartile range (IQR) provide a compelling visualization of the two races.

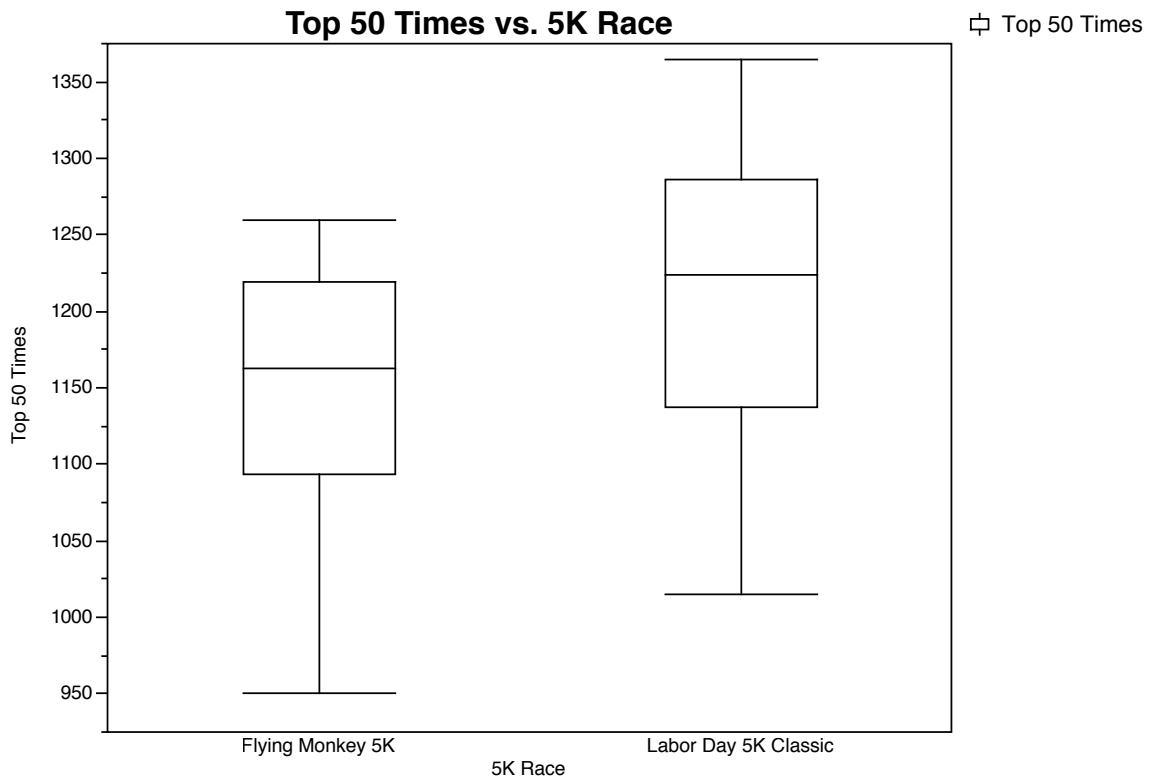


Figure 3 Boxplots Compare the Spreads of the Two Races

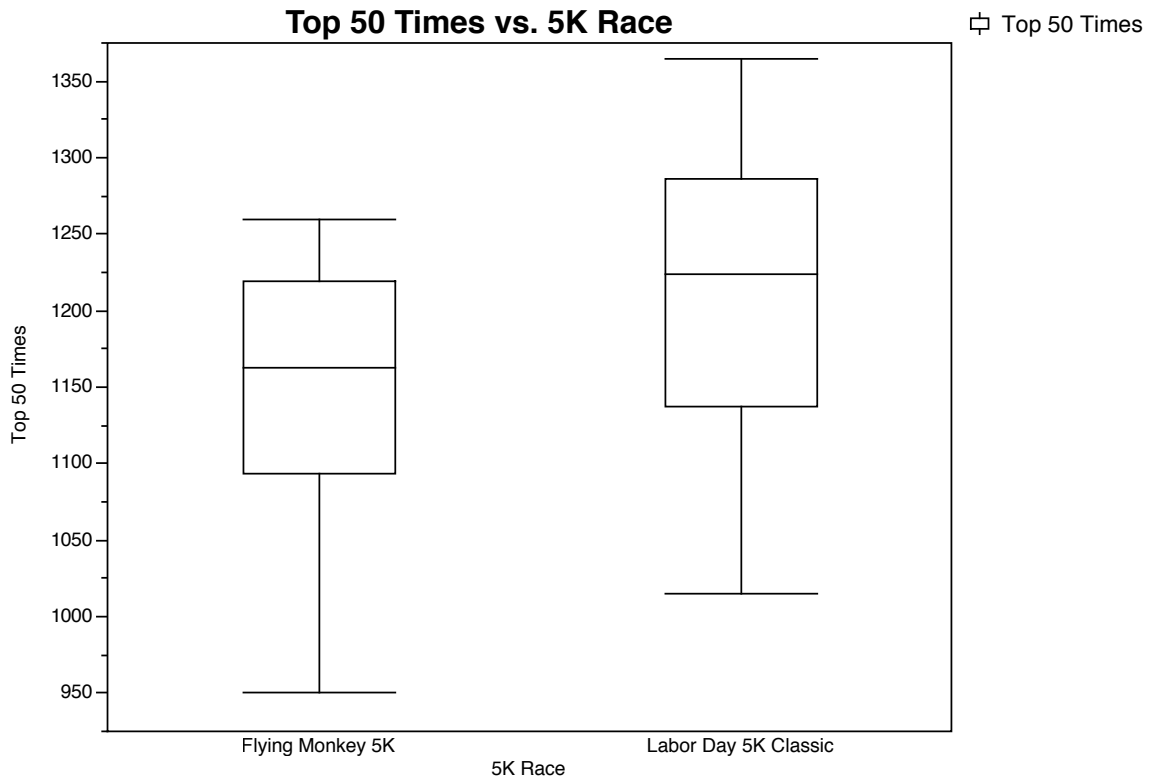


Figure 3 above compares the spread of race times for the top 50 runners of the Flying

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Project Description
February 20, 2015

Monkey 5K to the spread of race times for the top 50 runners of the Labor Day 5K Classic. The spread for the Flying Monkey is much smaller than that of the Labor Day race. All values in the five number summaries are smaller for the Flying Monkey 5K than for the Labor Day 5K Classic (see Table 1 on page 3). The interquartile range is also smaller for the Flying Monkey at 125.88 verses 149.65 for the Labor Day race. This provides strong visual evidence that the Flying Monkey is a faster race on average.