

An aerial photograph of a golf course. The image shows several green fairways, sand traps, and a water hazard. A large tree is visible in the upper left corner. The text 'Project Beeswarm' is overlaid in a white box in the center.

# Project Beeswarm

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# Introduction

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- The PGA Tour is one of the most cutthroat professional sports leagues in the world
- A matter of inches can determine the difference between glory and tragedy, not to mention millions of dollars
- For the matters of this project, we will look at which parts of the game of golf contribute the most to overall success (namely world ranking and total wins), and what the top professional golfers in the world have in common
- To be clear, we are looking at the success of players across all professional golf tours, not just the PGA.

Without further ado, let's take a look at some of the numbers from the 2025 PGA Tour season.



# Data

In this data set, there is traceable ShotLink data for 417 professional golfers across the PGA Tour, European Tour, LIV Golf Tour, Korn Ferry Tour, and more (all of which are considered to be professional golf). The table presented is a short list of players who have data collected for their professional rounds in 2025 for each of the metrics we will use in our study.

Here are the most important variables in "pga\_2025.csv":

- `wins` : number of events won in 2025
- `x\_wins` : expected number of wins in 2025, given SG data
- `putt\_true` : strokes gained (SG) putting
- `arg\_true` : SG around-the-green ("scrambling")
- `app\_true` : SG on approach shots
- `ott\_true` : SG off the tee
- `t2g\_true` : SG tee-to-green (everything except putting)
- `total\_true` : total SG

## **Strokes Gained (SG)**

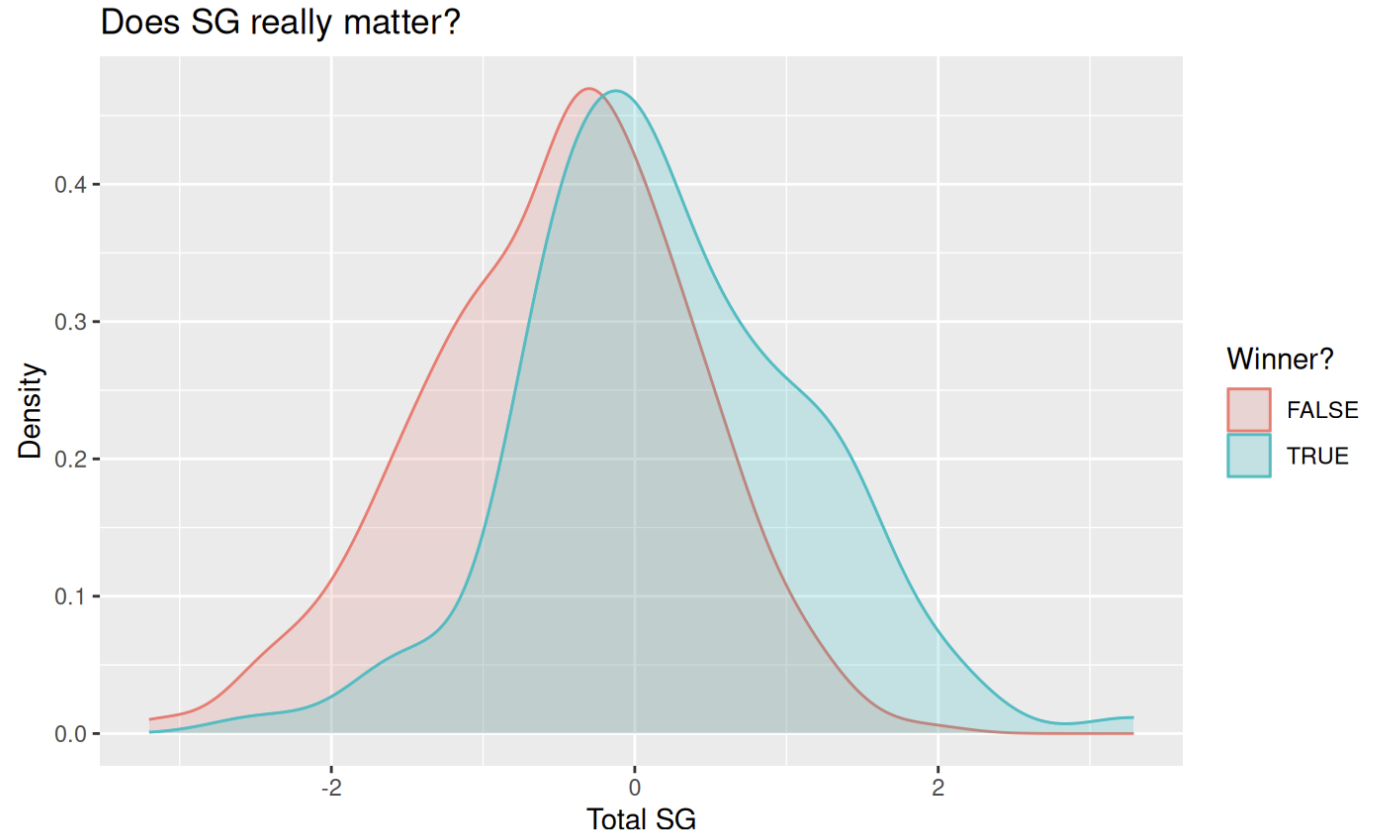
**How much better a golfer is than the rest  
of the field**

*Larger positive number means a larger  
margin above average*

# Cutthroat

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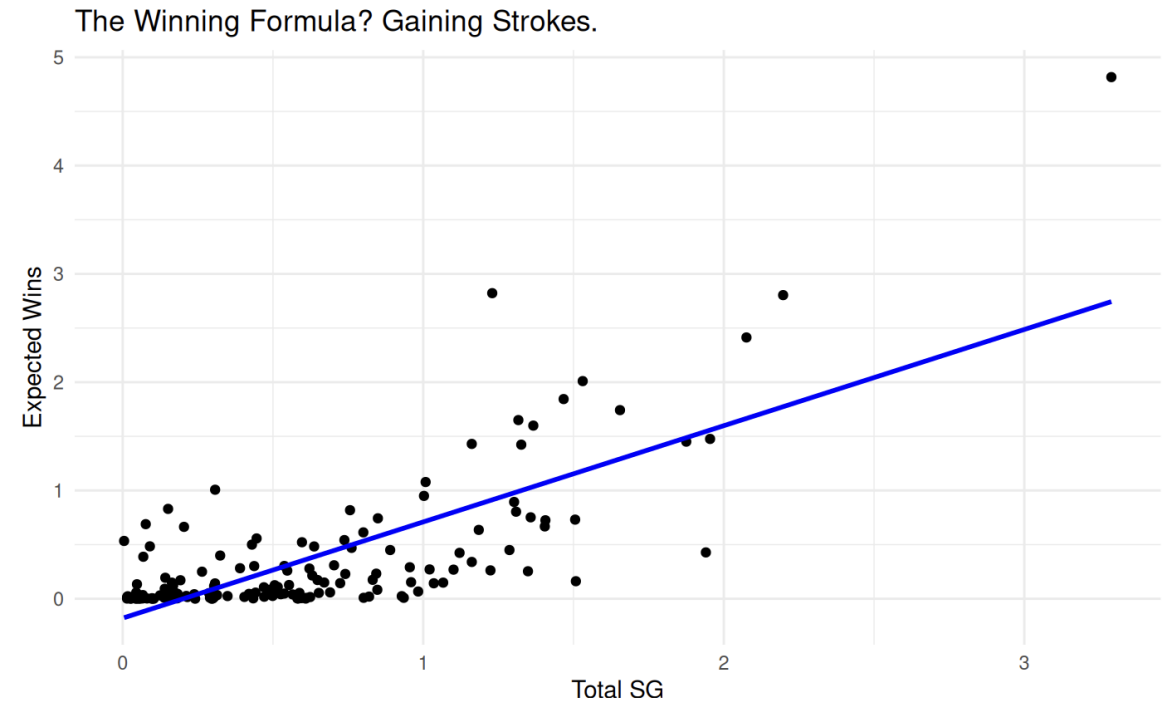
The graph below shows just how competitive professional golf is. As you can see, the curves for winners (people who won at least once) and non-winners (people who won zero times) are **very** close in shape and distribution.



# The Winning Formula

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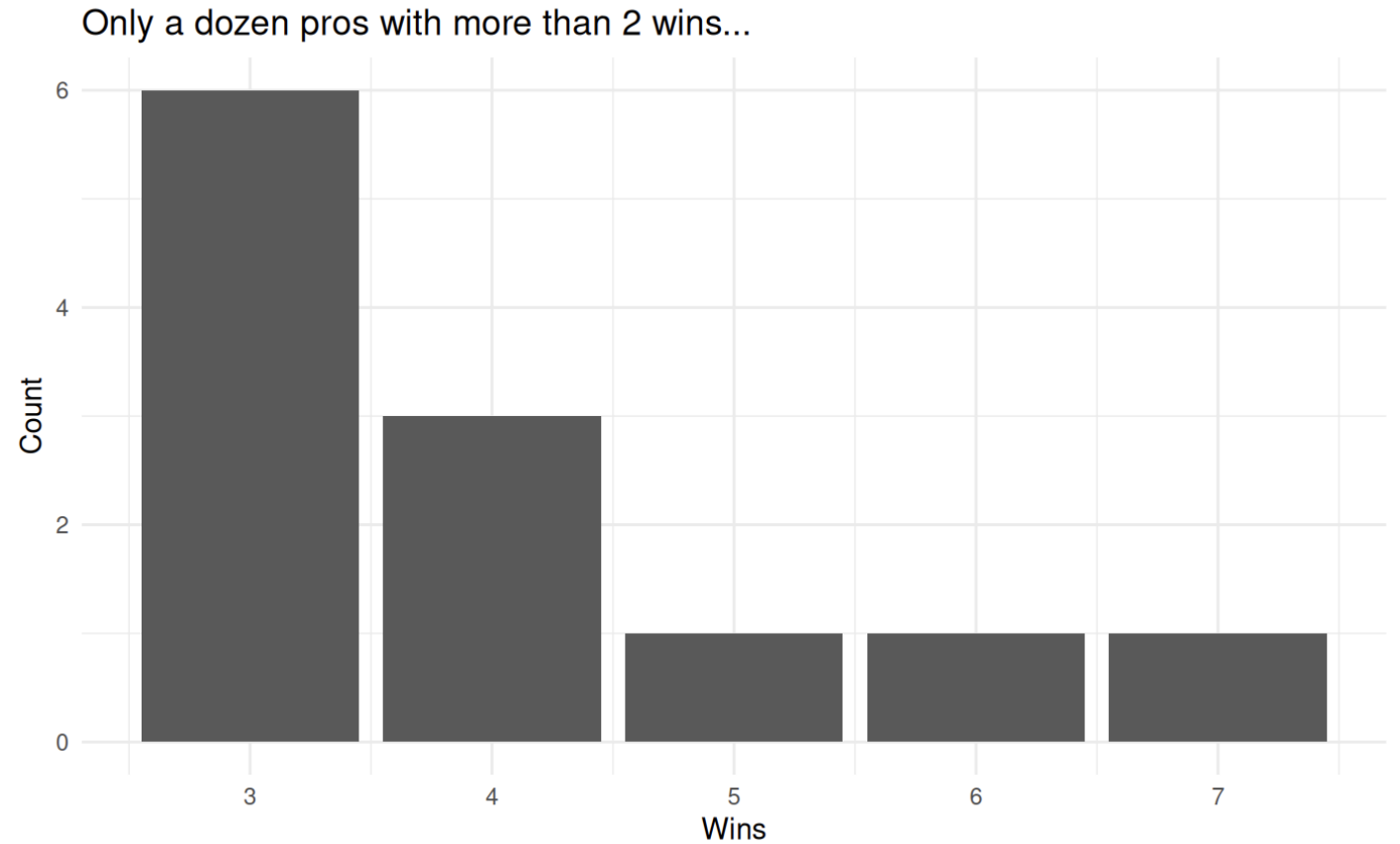
Here, we see a plot of players with a net positive total SG, and how many wins they are predicted to have in the season based upon their total SG. As we can see, SG is positively correlated with overall success. The player all the way in the top right is of course Scottie Scheffler, who put together a 2025 season nothing short of historical.



# Winners

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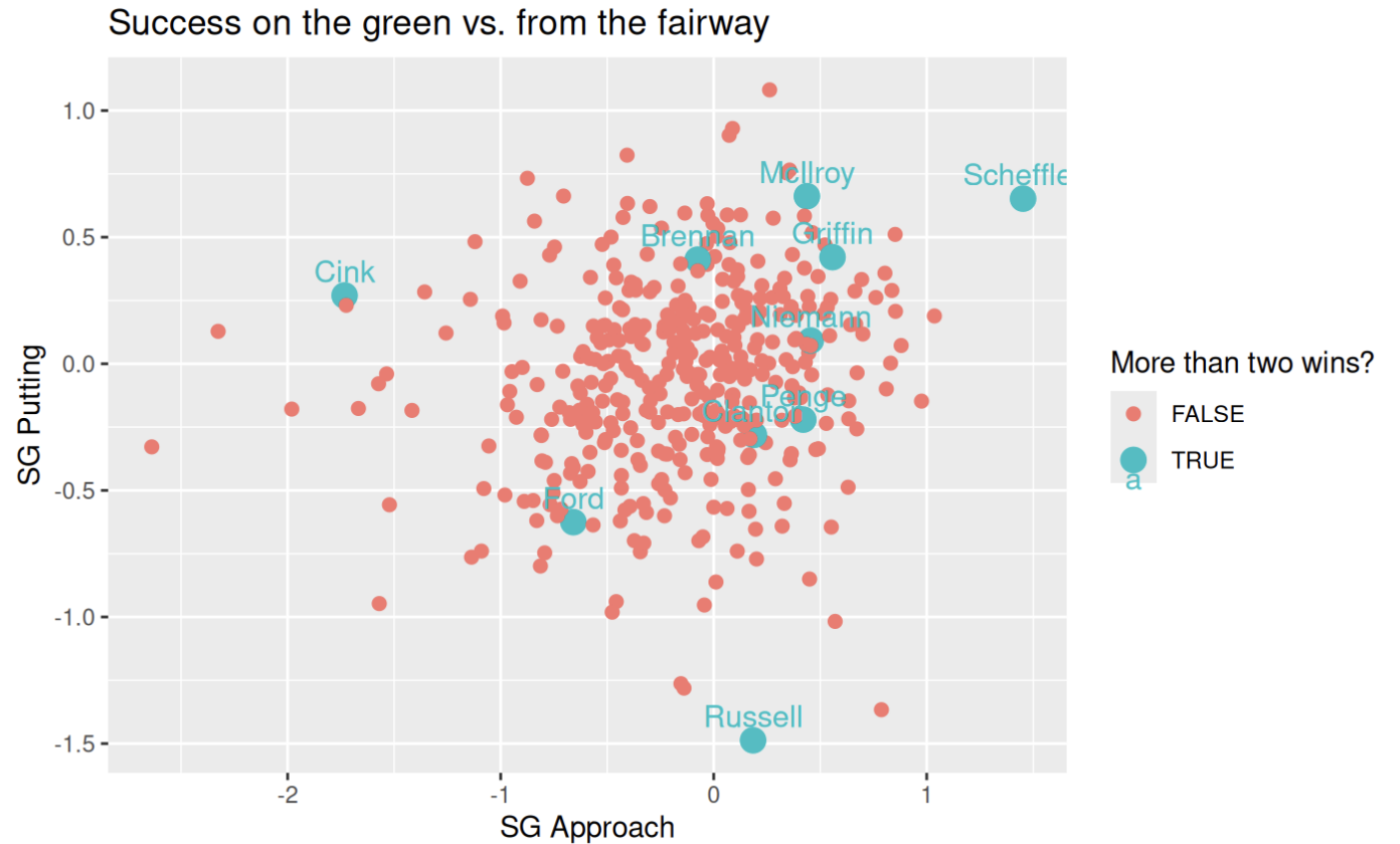
Here is a more simple plot looking at how many golfers won more than 2 events last season. Only 3 golfers across all tours were able to win 5 or more events.



# Skill Sets

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Here, we look at the skill sets of those players with more than two professional wins this season. As you can see, the "winning formula" may not be as uniform as we might have thought.



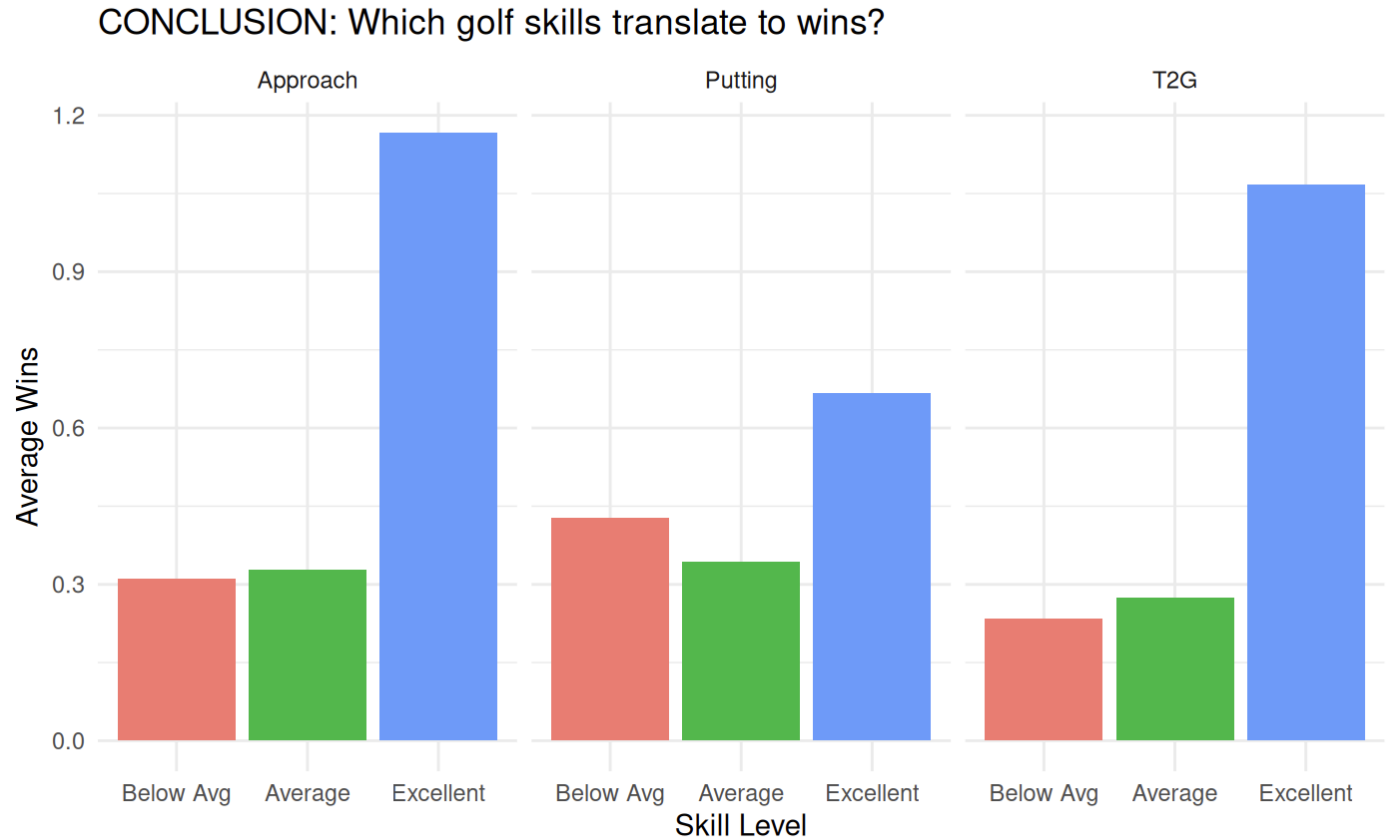
# Big Winners

<b>player_name</b>	<b>wins</b>	<b>total_true</b>	<b>putt_true</b>	<b>t2g_true</b>
Scheffler, Scottie	6	3.29	0.65	2.64
McIlroy, Rory	4	2.20	0.66	1.54
Griffin, Ben	3	1.47	0.42	0.98
Niemann, Joaquin	5	1.23	0.09	1.25
Penge, Marco	3	0.85	-0.22	1.44
Brennan, Michael	4	0.43	0.41	1.08
Clanton, Luke	4	0.03	-0.28	0.24

Here is some SG data for players that won at least 3 professional tournaments last season across all the professional golf tours. As you can see, it's a pretty short list.

# The Big Reveal

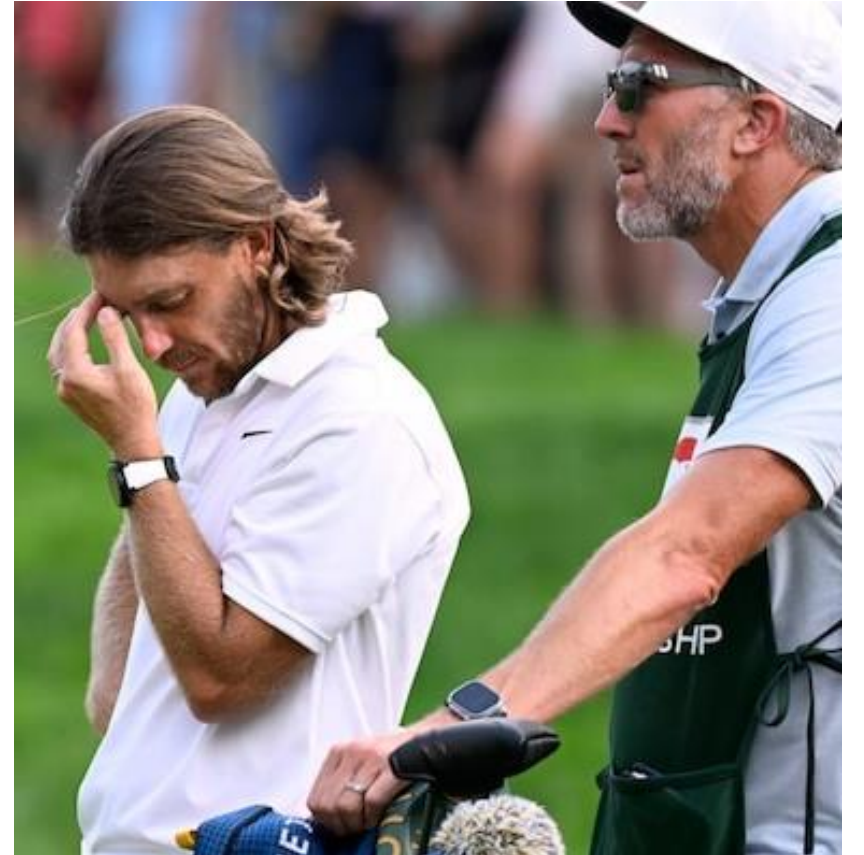
This final graph is perhaps the most important. It shows that there is a marginally larger difference in average wins of golfers with excellent ball striking (tee-to-green and approach) than golfers with excellent putting. This goes to show that while putting is widely considered to be the most important part of golf, it is more so because nearly every single professional golfer is a good putter. If they're not, it is a significant disadvantage. However, being a great ball striker gives a golfer a much greater edge than other parts of the game.



# Further Analysis

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- We can conclude that a greater advantage over the rest of the field is gained in areas other than putting
- The "winning formula" that we continue to mention is not uniform; no matter what your skill set is, you must have one or two parts of your game that are significantly better than the people you compete against
- Ball striking is often the skill that sets pros apart the most
- The fact that only 12 golfers were able to win more than 2 events in a season (given that there are more than 200 professional tournaments across all leagues in a given season) is enough to see that gaining strokes in any aspect of the game is a necessity



# Discussion

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- Professional golf is one of, if not the most cutthroat professional sport, given that there are so many aspects of an individual sport that must be mastered in order to even be competitive
- If you ever become interested in learning the game of golf, this is a good place to start
- In the future, we could look more specifically at the PGA Tour to see how pros at the top of the top stack up, as the PGA Tour is exclusively the top ~150 golfers in the world
- A similar analysis could be performed on other individual sports, e.g. tennis

