

DFS Player Points Probabilities for Each Hole Type

	Player Name	Cluster	-1.0	-0.5	0.5	3.0	8.0	13.0	\
0	Nicholas Lindheim	3-0	0.027	0.135	0.514	0.324	0.000	0.0	
1	Chris Stroud	3-0	0.000	0.196	0.500	0.304	0.000	0.0	
2	Rory McIlroy	3-0	0.058	0.135	0.529	0.279	0.000	0.0	
3	Scottie Scheffler	3-0	0.000	0.138	0.566	0.270	0.026	0.0	
4	Adam Hadwin	3-0	0.026	0.109	0.596	0.269	0.000	0.0	
..	
65	Jordan Spieth	5-1	0.010	0.019	0.308	0.663	0.000	0.0	
66	Will Zalatoris	5-1	0.000	0.000	0.308	0.654	0.038	0.0	
67	Brandon Wu	5-1	0.000	0.118	0.208	0.646	0.028	0.0	
68	Norman Xiong	5-1	0.000	0.028	0.343	0.630	0.000	0.0	
69	Taylor Pendrith	5-1	0.011	0.098	0.261	0.630	0.000	0.0	

Data Points

0	74.0
1	92.0
2	104.0
3	152.0
4	156.0
..	...
65	104.0
66	52.0
67	178.0
68	108.0
69	92.0

[70 rows x 9 columns]

Enter how many holes of each type of hole there is for the
upcoming tournament

```
print(f'{player_name} scored {total_points} points.')
```

How many holes of cluster 3-0 are there?



Enter the order in which those holes occur for the upcoming course

How many holes of cluster 3-0 are there? 3

How many holes of cluster 3-1 are there? 2

How many holes of cluster 4-0 are there? 4

How many holes of cluster 4-1 are there? 5

How many holes of cluster 4-2 are there? 1


How many holes of cluster 5-0 are there? 1

How many holes of cluster 5-1 are there? 2

Enter the order of the clusters separated by commas (e.g., 3-0,4-1,3-0):

| 

Enter the order of the clusters separated by commas (e.g., 3-0,4-1,3-0):

5-0,4-1,4-1,4-2,3-0,5-0,4-2,5-0,3-0,4-1,4-1 

Simulation of Holes for each Player

	Player Name	Hole 1	Hole 2	Hole 3	Hole 4	Hole 5	Hole 6	\
0	Aaron Baddeley	0.5	0.5	0.5	0.5	0.5	0.5	
1	Aaron Rai	0.5	0.5	-0.5	0.5	3.0	0.5	
2	Adam Hadwin	0.5	3.0	0.5	0.5	0.5	3.0	
3	Adam Schenk	0.5	0.5	-0.5	0.5	3.0	-0.5	
4	Adam Scott	0.5	0.5	0.5	-0.5	0.5	0.5	
..	
113	Viktor Hovland	0.5	0.5	3.0	3.0	6.0	0.5	
114	Vince Whaley	0.5	0.5	0.5	0.5	0.5	0.5	
115	Wyndham Clark	0.5	3.0	0.5	0.5	0.5	0.5	
116	Xander Schauffele	0.5	0.5	3.0	0.5	0.5	0.5	
117	Zac Blair	0.5	0.5	0.5	0.5	0.5	0.5	
	Hole 7	Hole 8	Hole 9	Hole 10	Hole 11	Hole 12	Hole 13	Hole 14 \
0	0.5	3.0	3.0	0.5	0.5	0.5	-0.5	3.0
1	3.0	0.5	-0.5	0.5	-0.5	3.0	0.5	3.0
2	-0.5	0.5	3.0	0.5	3.0	0.5	0.5	0.5
3	-0.5	0.5	0.5	0.5	0.5	0.5	3.0	-0.5
4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Final Simulation DFS Scores for each Player

```
[      Player Name  Total Points
63      Ludvig Åberg      105.5
97    Scottie Scheffler      101.5
12      Ben Griffin      100.0
113    Viktor Hovland      92.5
24      Carson Young      91.0
..      ...      ...
14      Ben Martin      18.5
74      Max Homa      18.5
27      Chris Kirk      16.0
80      Nico Echavarria      16.0
39      Erik van Rooyen      15.5
```

```
[118 rows x 2 columns],
```

```
      Player Name  Total Points
85    Robby Shelton      104.0
87      Rory McIlroy      99.5
73    Maverick McNealy      98.0
30      Corey Connors      95.5
82    Peter Malinski      92.0
```

Given DFS scores and Salary we run each simulation through the lineup optimizer

1. G	Eric Cole	87.0	6600.0\$
2. G	Matt Fitzpatrick	98.0	7900.0\$
3. G	Peter Malnati	83.5	6200.0\$
4. G	Scottie Scheffler	121.5	12100.0\$
5. G	Si Woo Kim	100.5	7100.0\$
6. G	Viktor Hovland	98.5	9500.0\$

Fantasy Points 589.00
Salary 49400.00

1. G	Cameron Young	102.0	8500.0\$
2. G	Corey Connors	101.5	7500.0\$
3. G	Matt Fitzpatrick	108.5	7900.0\$
4. G	Peter Malnati	94.0	6200.0\$
5. G	Rory McIlroy	105.5	10800.0\$
6. G	Si Woo Kim	112.5	7100.0\$

Fantasy Points 624.00
Salary 48000.00

Filter Lineups based on Budget

```
: # Filter the DataFrame for 'Budget' > X
df_merged = df_merged[df_merged['Budget'] > 47000]
# Check the length of the DataFrame df
df_length = len(df_merged)

# Print the length of the DataFrame
print("Length of DataFrame df:", df_length)
df_merged.to_csv('/Users/danielbrown/Desktop/Golf_Sim_masters_2.csv', index=False)
df_merged
df = df_merged
```

Length of DataFrame df: 446

Player Counts after all Simulations and Lineup Optimization

	Player	Count
3	Scottie Scheffler	196
4	Si Woo Kim	188
15	Wyndham Clark	171
1	Matt Fitzpatrick	162
7	Corey Conners	131
21	Sahith Theegala	116
12	Joaquin Niemann	116
33	Xander Schauffele	115
41	Sam Burns	100
8	Rory McIlroy	99
10	Hideki Matsuyama	97
9	Brian Harman	93
32	Adam Scott	93
17	Shane Lowry	81
44	Nick Taylor	77
2	Peter Malnati	73
27	Denny McCarthy	71
29	Ryo Hisatsune	65
22	Harris English	59
11	Luke List	59

How many times do pairs of players show up in all my lineups?

Sorted and filtered pair counts:

```
('Luke List', 'Scottie Scheffler'): 39
('Matthieu Pavon', 'Scottie Scheffler'): 36
('Akshay Bhatia', 'Scottie Scheffler'): 34
('Nick Dunlap', 'Scottie Scheffler'): 32
('Scottie Scheffler', 'Stephan Jaeger'): 31
('Scottie Scheffler', 'Viktor Hovland'): 27
('Austin Eckroat', 'Scottie Scheffler'): 25
('Cameron Young', 'Scottie Scheffler'): 24
('Lucas Glover', 'Scottie Scheffler'): 24
('Scottie Scheffler', 'Will Zalatoris'): 23
('Scottie Scheffler', 'Tony Finau'): 23
('J.T. Poston', 'Scottie Scheffler'): 22
('Eric Cole', 'Scottie Scheffler'): 22
('Chris Kirk', 'Scottie Scheffler'): 21
('Justin Rose', 'Scottie Scheffler'): 21
('Jason Day', 'Scottie Scheffler'): 21
('Russell Henley', 'Scottie Scheffler'): 21
('Corey Connors', 'Scottie Scheffler'): 19
('Scottie Scheffler', 'C. McNeely'): 19
```

How many times do triplets of players show up in all my lineups?

Sorted and filtered triplet counts:

```
('Luke List', 'Scottie Scheffler', 'Stephan Jaeger'): 9
('Luke List', 'Scottie Scheffler', 'Viktor Hovland'): 8
('Lucas Glover', 'Luke List', 'Scottie Scheffler'): 7
('Austin Eckroat', 'Scottie Scheffler', 'Viktor Hovland'): 7
('Chris Kirk', 'Scottie Scheffler', 'Viktor Hovland'): 7
('Cameron Smith', 'Matthieu Pavon', 'Scottie Scheffler'): 7
('J.T. Poston', 'Luke List', 'Scottie Scheffler'): 7
('Akshay Bhatia', 'Denny McCarthy', 'Scottie Scheffler'): 6
('Akshay Bhatia', 'Scottie Scheffler', 'Tony Finau'): 6
('Justin Rose', 'Scottie Scheffler', 'Viktor Hovland'): 6
('Matthieu Pavon', 'Scottie Scheffler', 'Tony Finau'): 6
('Luke List', 'Patrick Cantlay', 'Scottie Scheffler'): 6
('Matthieu Pavon', 'Nick Dunlap', 'Scottie Scheffler'): 6
('Lucas Glover', 'Patrick Cantlay', 'Scottie Scheffler'): 6
('Akshay Bhatia', 'Scottie Scheffler', 'Stephan Jaeger'): 5
('Scottie Scheffler', 'Si Woo Kim', 'Stephan Jaeger'): 5
('Austin Eckroat', 'Scottie Scheffler', 'Will Zalatoris'): 5
('Eric Cole', 'Scottie Scheffler', 'Si Woo Kim'): 5
```

Individual Player DFS Distribution

	Name	Prob Top 10	Prob Make Cut	Made Cut	Top 10 \
0	Xander Schauffele	0.19	0.64	1	0
1	Sam Burns	0.14	0.60	0	0
2	Justin Thomas	0.13	0.55	1	1
3	Jordan Spieth	0.14	0.64	0	0
4	Brian Harman	0.18	0.70	1	0
..
150	J.B. Holmes	0.02	0.31	0	0
151	Greg Koch	0.02	0.31	1	0
152	Blaine Hale	NaN	NaN	0	0
153	Kevin Aylwin	0.02	0.31	1	0
154	David Bradshaw	0.02	0.32	1	0

click to expand output; double click to hide output

```
0 91.447067
1 32.269899
2 104.366626
3 28.285160
4 65.683678
..
150 19.666079
151 65.660075
152 30.648184
153 61.095577
154 101.429367
```

[155 rows x 6 columns]

Player Made Cut Probabilities

FPTS_Range	60-70	70-80	80-90	90-100	100-110	110-120 \
Player Name						
Nick Dunlap	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Erik van Rooyen	0.000000	0.000000	0.000000	0.250000	0.250000	0.250000
Matt Kuchar	0.000000	0.200000	0.400000	0.200000	0.000000	0.000000
Chris Kirk	0.000000	0.000000	0.166667	0.500000	0.000000	0.166667
Byeong Hun An	0.142857	0.142857	0.285714	0.000000	0.285714	0.000000
...
Gary Woodland	0.000000	0.500000	0.500000	0.000000	0.000000	0.000000
Grayson Murray	0.000000	0.000000	0.000000	0.333333	0.666667	0.000000
Greyson Sigg	0.000000	0.250000	0.500000	0.250000	0.000000	0.000000
Harris English	0.000000	0.571429	0.428571	0.000000	0.000000	0.000000
Zecheng Dou	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000

FPTS_Range	120-130	130-140	Data Points
Player Name			
Nick Dunlap	0.0	1.000000	1
Erik van Rooyen	0.0	0.250000	4
Matt Kuchar	0.0	0.200000	5
Chris Kirk	0.0	0.166667	6
Byeong Hun An	0.0	0.142857	7
...
Gary Woodland	0.0	0.000000	2
Grayson Murray	0.0	0.000000	3
Greyson Sigg	0.0	0.000000	4
Harris English	0.0	0.000000	7
Zecheng Dou	0.0	0.000000	1

[223 rows x 9 columns]

DFS Feature Engineering

	Unnamed: 0	Event Title	Event Date	Player Name	Score	Round	Pars	Scores	Hole	Double_Eagle_or_Better	...	Streak_of_3_Birdies_or_Better	Bogey_Free_Round	
	0	308646	3M Open	2022-07-21	Aaron Baddeley	-1	1	4	4.0	1	0	...	0	C
	1	308647	3M Open	2022-07-21	Aaron Baddeley	-1	1	4	5.0	2	0	...	0	C
	2	308648	3M Open	2022-07-21	Aaron Baddeley	-1	1	4	4.0	3	0	...	0	C
	3	308649	3M Open	2022-07-21	Aaron Baddeley	-1	1	3	2.0	4	0	...	0	C
	4	308650	3M Open	2022-07-21	Aaron Baddeley	-1	1	4	3.0	5	0	...	0	C

536701	414751	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	CUT	2	3	2.0	14		0	...	0	C
536702	414752	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	CUT	2	4	4.0	15		0	...	0	C
536703	414753	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	CUT	2	4	4.0	16		0	...	0	C
536704	414754	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	CUT	2	3	3.0	17		0	...	0	C
536705	414755	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	CUT	2	5	4.0	18		0	...	0	C

DFS Feature Engineering

	Event Title	Event Date	Player Name	Round	\
0	3M Open	2022-07-21	Aaron Baddeley	1	
1	3M Open	2022-07-21	Aaron Baddeley	1	
2	3M Open	2022-07-21	Aaron Baddeley	1	
3	3M Open	2022-07-21	Aaron Baddeley	1	
4	3M Open	2022-07-21	Aaron Baddeley	1	
...
536701	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	2	
536702	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	2	
536703	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	2	
536704	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	2	
536705	Zurich Classic of New Orleans	2023-04-20	Z. Dou / Z. Blair	2	

	Hole	Scores	Pars	Score_Relative_to_Par	Cumulative_Score
0	1	4.0	4	0.0	4.0
1	2	5.0	4	1.0	9.0
2	3	4.0	4	0.0	13.0
3	4	2.0	3	-1.0	15.0
4	5	3.0	4	-1.0	18.0
...
536701	14	2.0	3	-1.0	121.0
536702	15	4.0	4	0.0	125.0
536703	16	4.0	4	0.0	129.0
536704	17	3.0	3	0.0	132.0
536705	18	4.0	5	-1.0	136.0

[536706 rows x 9 columns]

DFS Feature Engineering

Round	Under_70_All_Rounds	Overall_Cumulative_Score	Position_At_Hole	Cumulative_Score_Relative_to_Par	FPTS	Cumulative_FPTS	FPTS_Positions	Total_FPTS
0	0	4.0	24	0.0	0.5	0.5	4	4.5
0	0	4.0	32	0.0	0.5	1.0	2	3.0
0	0	9.0	77	1.0	-0.5	0.5	0	0.5
0	0	8.0	60	0.0	0.5	1.0	0	1.0
0	0	13.0	68	1.0	0.5	1.5	0	1.5
...
0	0	121.0	49	-7.0	3.0	44.5	1	45.5
0	0	125.0	44	-7.0	0.5	45.0	1	46.0
0	0	129.0	45	-7.0	0.5	45.5	1	46.5
0	0	132.0	46	-7.0	0.5	46.0	1	47.0

DFS Feature Engineering

	Event Title	Player Name	Round	Hole \
0	3M Open	Aaron Baddeley	1	1
1	3M Open	Aaron Baddeley	1	2
2	3M Open	Aaron Baddeley	1	3
3	3M Open	Aaron Baddeley	1	4
4	3M Open	Aaron Baddeley	1	5
...
536701	Zurich Classic of New Orleans	Z. Dou / Z. Blair	2	14
536702	Zurich Classic of New Orleans	Z. Dou / Z. Blair	2	15
536703	Zurich Classic of New Orleans	Z. Dou / Z. Blair	2	16
536704	Zurich Classic of New Orleans	Z. Dou / Z. Blair	2	17
536705	Zurich Classic of New Orleans	Z. Dou / Z. Blair	2	18
	Cumulative_Score	Under_70_All_Rounds		
0	4.0	0		
1	9.0	0		
2	13.0	0		
3	15.0	0		
4	18.0	0		
...		
536701	52.0	0		
536702	56.0	0		
536703	60.0	0		
536704	63.0	0		
536705	67.0	0		

[536706 rows x 6 columns]