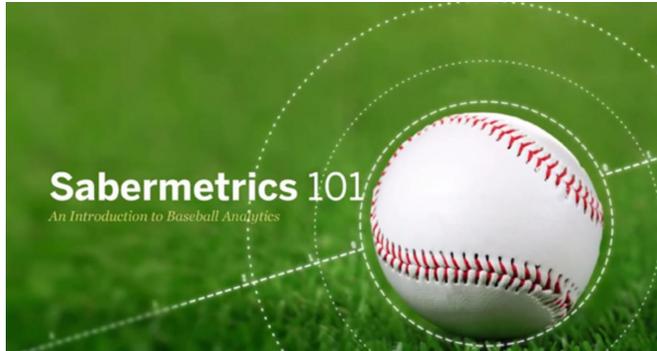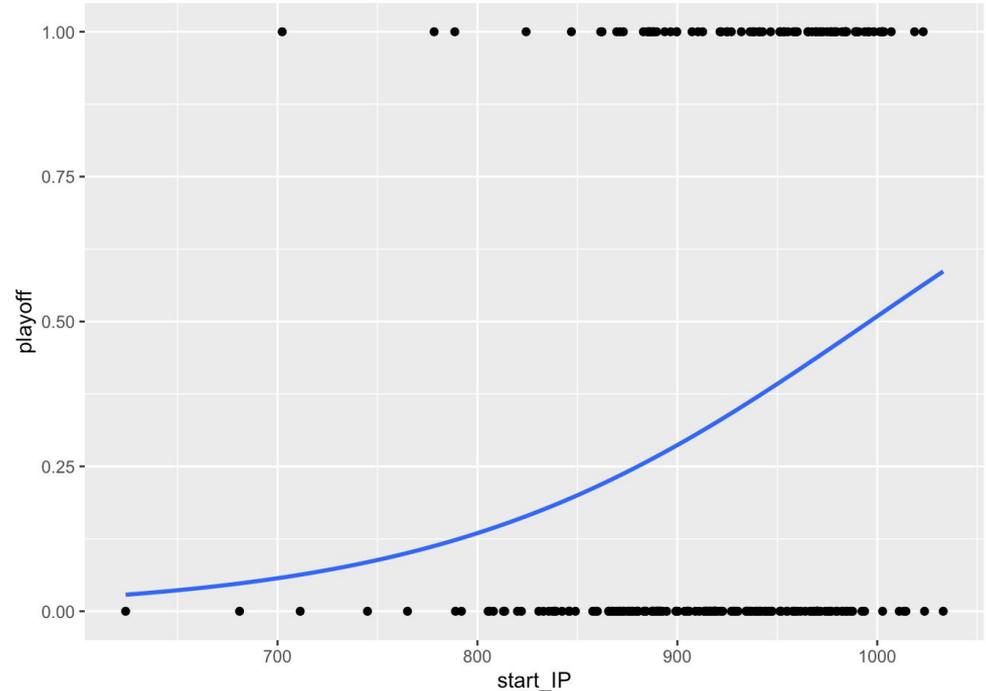# Sabermetrics

Mentee: David A Wang
Mentor: Michael Cunetta

Is the number of innings pitched by starters associated with a team's chances of making the playoffs? — Acquire data

- Lahman & Retrosheet play-by-play
- Inning pitched by starter, HR allowed, walks issued, batter strikeout
- FIP = (13*HR + 3*BB - 2*K) / IP
- Sample size: 38,876 games, from 2012-2019 season

Is the number of innings pitched by starters associated with a team's chances of making the playoffs? — Logistic model

- Inning pitched by starter and the probability of a team making the playoff
- Inning pitched and probability of making the playoff, account for the starter ability (FIP)

Is the number of innings pitched by starters associated with a team's chances of making the playoffs? — Conclusion

- $p(playoff) = \dfrac{\exp(-9.44 + 0.00948 \times starterIP)}{(1 + \exp(-9.44 + 0.00948 \times starterIP))}$

  - Max: 58.7% (1033)
  - Min: 2.8% (624)

term	estimate	std.error	statistic	p.value
\<chr\>	\<dbl\>	\<dbl\>	\<dbl\>	\<dbl\>
(Intercept)	-9.44	2.47	-3.82	0.000134
start_IP	0.00948	0.00266	3.57	0.000359

- $p(playoff) = \dfrac{\exp(1.39 + 0.0000103 \times starterIP - 2.55 \times FIP)}{1 + \exp(1.39 + 0.0000103 \times starterIP - 2.55 \times FIP)}$

  - Max: 29% (1033, 0.9)
  - Min: 28.9% (624, 0.9)
  - High p-value, standard error

term	estimate	std.error	statistic	p.value
\<chr\>	\<dbl\>	\<dbl\>	\<dbl\>	\<dbl\>
(Intercept)	1.39	2.90	0.479	0.632
start_IP	-0.0000103	0.00295	-0.00348	0.997
FIP_start	-2.55	0.450	-5.67	0.0000000143