

# Supplementary Materials

## Details of Regular Expression Patterns

Pattern	%	Example
<u>Player<sub>1</sub></u> pass complete short left / middle / right to <u>Player<sub>2</sub></u> for [...]	23.7	<u>Kyler Murray</u> pass complete short right to <u>Larry Fitzgerald</u> for 9 yards (tackle by <i>Jessie Bates</i> and <i>Geno Atkins</i> )
<u>Player<sub>1</sub></u> pass incomplete short [...]	9.0	<u>Carson Wentz</u> pass incomplete short right intended for <i>Boston Scott</i>
<u>Player<sub>1</sub></u> up the middle for [...]	8.2	<u>Adrian Peterson</u> up the middle for 5 yards (tackle by <i>Robert Quinn</i> )
<u>Player<sub>1</sub></u> left / right end for [...]	8.0	<u>David Johnson</u> left end for 1 yard (tackle by <i>Geno Atkins</i> and [...])
<u>Player<sub>1</sub></u> left / right tackle for [...]	6.8	<u>Miles Sanders</u> right tackle for -1 yards (tackle by <i>Julian Love</i> )
<u>Player<sub>1</sub></u> left / right guard for [...]	6.4	<u>Saquon Barkley</u> left guard for -3 yards (tackle by <i>Anthony Rush</i> )
<u>Player<sub>1</sub></u> kicks off [0-9]+ [...]	6.1	<u>Zane Gonzalez</u> kicks off 65 yards, touchback
<u>Player<sub>1</sub></u> pass incomplete deep left / right intended for [...]	5.9	<u>Daniel Jones</u> pass incomplete deep right intended for <i>Sterling Shepard</i> (defended by <i>Avonte Maddox</i> )
<u>Player<sub>1</sub></u> pass complete deep left / right to <u>Player<sub>2</sub></u> for	5.0	<u>Daniel Jones</u> pass complete deep right to <u>Darius Slayton</u> for 33 yards (tackle by <i>Rasul Douglas</i> )
<u>Player<sub>1</sub></u> kicks extra point good	4.8	<u>Jake Elliott</u> kicks extra point good
<u>Player<sub>1</sub></u> punts [0-9]+ [...]	3.7	<u>Cameron Johnston</u> punts 43 yards
<u>Player<sub>1</sub></u> sacked by <u>PLAYER<sub>2</sub></u>	3.5	<u>Daniel Jones</u> sacked by <i>Timmy Jernigan</i> for -10 yards
[...] returned by <u>Player<sub>1</sub></u> for [0-9]+	2.6	<u>Mitch Wishnowsky</u> kicks off 66 yards, returned by <u>Reggie Bonnafon</u> for 24 yards
<u>Player<sub>1</sub></u> [...] yard field goal good	2.1	<u>Jake Elliott</u> 31 yard field goal good
<u>Player<sub>1</sub></u> kicks onside [...]	1.8	<u>Brandon McManus</u> kicks onside 9 yards,
[...] is intercepted by <u>PLAYER<sub>1</sub></u>	1.0	<u>Josh Allen</u> pass deep middle is intercepted by <u>Xavien Howard</u> at MIA-0 and returned for no gain
[...] muffed catch by <u>PLAYER<sub>1</sub></u>	0.7	<u>Matt Wile</u> punts 37 yards, muffed catch by <u>Danny Amendola</u>
[...] recovered by <u>PLAYER<sub>1</sub></u>	0.5	<i>Jameis Winston</i> fumbles, recovered by <u>Mike Evans</u> at NYG-3, touchdown
[...] fair catch by <u>PLAYER<sub>1</sub></u>	0.2	<u>Sam Koch</u> punts 39 yards, fair catch by <u>Desmond King</u> at LAC-12

**Table 1. The full table of frequent patterns used to extract which players had the ball from full play-by-play textual descriptions. Underlining indicates the player or players who had the ball, and italics indicates other players mentioned.**