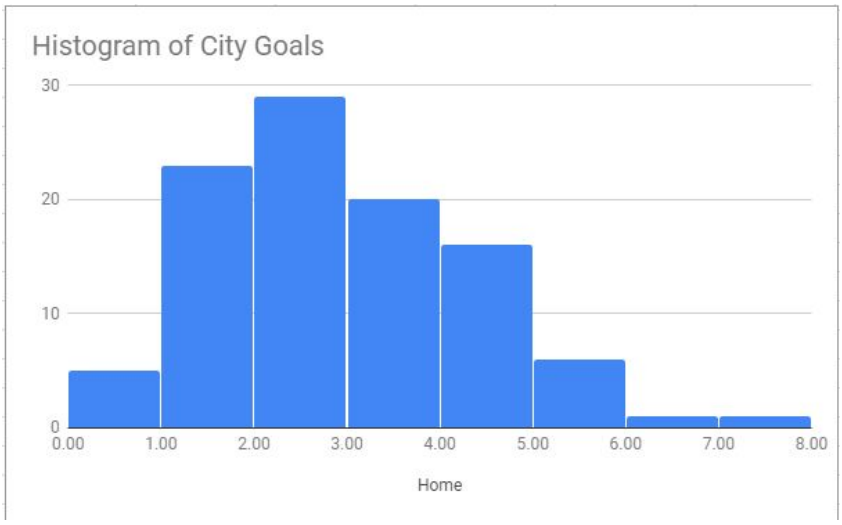
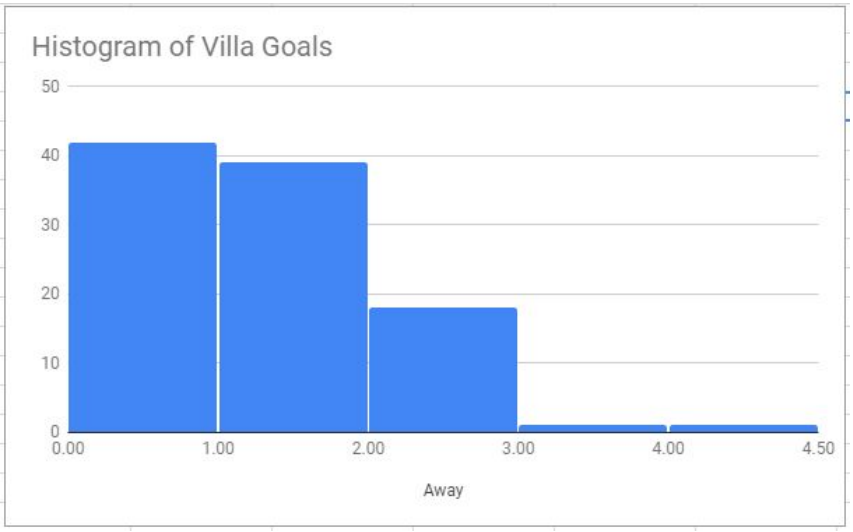
Experimental Runs

Experiment 1 : Prediction Accuracy

Home wins:	77
Draws:	13
Away wins:	10

With some preliminary tests on the match between Manchester City and Aston Villa, we find that the simulator produced 77% wins for City, 10% wins for Villa and 13% draws. Comparatively, our Poisson model predicted 86.3% chance of a City win, 9.4% chance of a draw and only 4.3% chance of a Villa win. For comparison, the actual score of the match in the 2015/16 Premier League season was 4-0 to Man City.





As can be seen from the histograms above, City scored a lot more goals than Villa (which is expected given the relative strength of the teams).

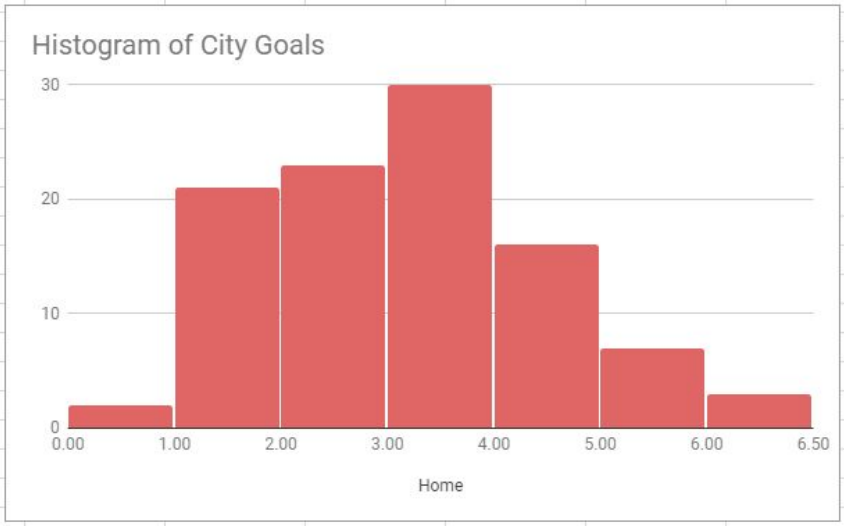
	Home	Away
Mean	2.46	0.82
Std Dev	1.424319792	0.8333939372

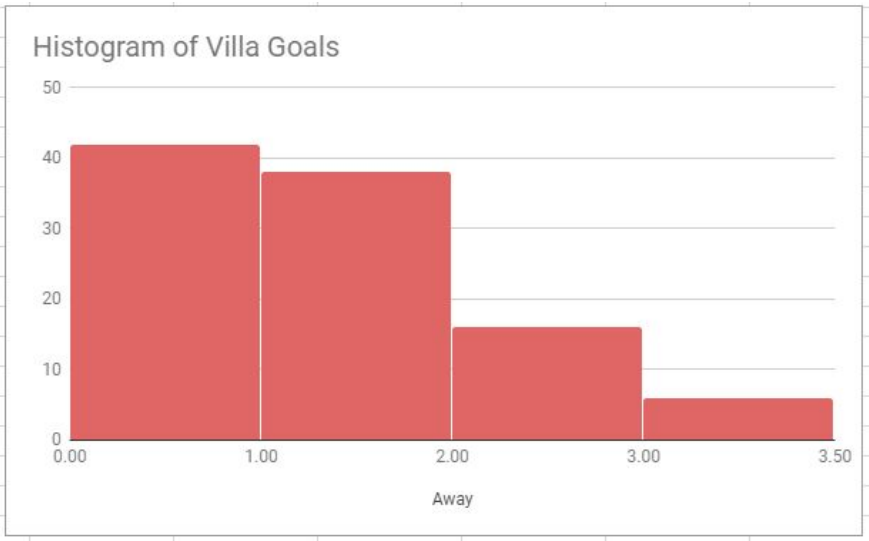
Finally, the mean goals scored by City was considerably higher than Villa. A paired t-test at 99% confidence level between the goals scored by each team gives p-value = 2.542758x10^-15, which definitely implies a significant difference.

Experiment 2 : Tactics Selection

Home wins:	76
Draws:	12
Away wins:	12

From the results above, it seems that there is an improvement in the probability of winning the match by increasing Pass Length and Chance Creation Passing! Villa went from winning 10% of simulations to 12%. Let us look at the goals scored distribution and t-tests for further analysis.





From the histograms above, it seems as though Villa playing more risky passes causes City to score more goals. In addition, there doesn't seem to be an obvious change in the number of goals scored by Villa.

	Home	Away
Mean	2.71	0.88
Std Dev	1.358066064	0.8908060134

With these new means, we ran a two sample t-test at 95% confidence to check if there is a significant difference in the number of goals scored.

T-test for Home goals	0.2270393189	<- Cannot reject H_0
T-test for away goals	0.6311292736	<- Cannot reject H_0

As can be seen from the table above, there doesn't seem to be a significant increase in the number of goals scored by both sides, although City does seem to have the edge in this matchup.