Worksheet 10: Probability and Expectation in Sports

Your name:

Your student ID number:

Football Win Probabilities.

1. What is the probability of the Lions winning the game if they go for the first down (go for it)? If they succeed, their win probability is 0.4, and if they fail, it is 0.15. Their probability of success is 0.53.

2. What is the probability of the Lions winning the game if they go for a field goal? If they succeed, their win probability is 0.32, and if they fail it is 0.13. Their probability of success is 0.71.

Baseball Hit Probabilities.

3. Why is it not a good enough strategy to pick the closest historical batted ball for prediction (remember our strategy picks the closest k and reports a probability)? Where on the graph of statcast data wouldn't this work?

Brainstorming for Sports.

4. Give an example of a probability in sports that you might try to estimate. What is the context of the probability, and how might you use it?

Football Expected Points.

5. What is the expected points if the Packers kick a field goal? A success is worth 2.6 points, a failure is worth 2.02 points for the Chiefs, and their probability of success is 0.55.

6. Why might we care about the difference between the win probability and expected points model in decision-making? When might we use one or the other?

Baseball Expected Runs.

Base Runners			2010-2015		
1B	2B	3B	0 outs	1 outs	2 outs
__	__	__	0.481	0.254	0.098
1B	__	__	0.859	0.509	0.224
__	2B	__	1.100	0.664	0.319
1B	2B	__	1.437	0.884	0.429
__	__	3B	1.350	0.950	0.353
1B	__	3B	1.784	1.130	0.478
__	2B	3B	1.964	1.376	0.580
1B	2B	3B	2.292	1.541	0.752

Figure 1: Expected Run Matrix for Major League Baseball

7. How valuable is a walk with no one on, no one out? How valuable is a home run in the same situation?

8. In which situation is a walk most valuable? In which is it least valuable?

Brainstorming for IRL.

9. Give an example of an "expected metric" for your real life. What is the context for the metric, and what would you use it for?