1st section: general trends/metrics
2nd section: regression to determine success factors

General Trends/Corner Metrics

Corner Positive Outcome Rate by Inserter			
Inserter	Total # of corner inserts	Number of corners resulting in a positive outcome	Positive outcome rate
#6 Macy	19	13	68.42
#26 Barb	10	5	50
#23 Kira	3	2	66.67
#9 Gracie	2	1	50
#11 Logan	1	0	0

NOTE: positive outcome defined as goal, corner, SOG, and stroke

- Looking from a pure numerical standpoint, Macy has not only had the most opportunities, but has the highest success rate among all attempted inserts
- Even though Barb has had more inserts than the rest of the group combined (excluding Macy), she has only converted about half of those opportunities into positive outcomes
- Kira has a high conversion rate, but a limited sample size

L1 Reception to Release Time (Direct to L1)			
L1 Castle	Ball received by L1 (sec.msec)	Ball released by L1 (sec.msec)	Reception to Release Time
#11 Logan	10.55	11.92	1.37
#11 Logan	31.77	33.2	1.43
#11 Logan	3.79	4.73	0.94
AVERAGE			1.25
VARIANCE			0.27

- Although Logan's average tends to be low, the variance is quite indicating widespread data points and deviation from her mean value
- Logan, or any one at the L1, could benefit from consistency to try to get this variance down

	Slip to L1 Reception to Release Time (Direct to a Castle)				
	Castle Targeted	L1 Receiver	Ball received by Castle (sec.msec)	Ball released by L1 (sec.msec)	Reception to Release Time
	1	**#3 Birdie**	9.35	10.9	1.55
	1	**#11 Logan**	9.99	11.54	1.55
	1	**#11 Logan**	7.55	9.27	1.72
	1	**#11 Logan**	10.55	12.32	1.77
	1	**#11 Logan**	2.26	3.98	1.72
	2	**#3 Birdie**	10.56	12.5	1.94
	2	**#3 Birdie**	8.47	10.19	1.72
AVERAGES	Castle 1 Overall				1.662
	Castle 1 Variance				0.1042592922
	Castle 2 Variance				0.1555634919
	Castle 2 Overall				1.83
	To Birdie (from 1) Overall				1.55
	To Logan Overall				1.69
	To Birdie (from 2) Overall				1.83

- Interestingly, the slip times from castles 1 and 2 are roughly the same, but with castle 2 having a higher variance (potentially due to the distance between castle 2 and L1)
- Birdie's release time from L1, when slipped the ball from castle 1, is slightly lower than Logan's, indicating faster release
- Even so, the difference between Logan's release time, Birdie's castle 1 release time, and Birdie's castle 2 release time seem to be equidistant, despite castle 2 being further - this could indicate inefficiency on Logan's part at L1

Assessing the Marginal Impact of Features on Corner Success

Variable names/descriptions:

Success: Binary variable representing success: 1 = success (re-corner, goal), 0 = no success
MacyInsertion: Binary variable representing Macy's Insertions: 1 = Macy as inserter, 0 = other inserter
BarbInsertion: Binary variable representing Barb's Insertions: 1 = Barb as inserter, 0 = other inserter
KiraInsertion: Binary variable representing Kira's Insertions: 1 = Kira as inserter, 0 = other inserter
InsertionTime: Time (seconds.milliseconds) that ball took to go from insert to reception
ReceptiontoReleaseTime: Time (seconds.milliseconds) that ball took to go from reception to release
InsertOff: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
L1: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
1Hit: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
1L1: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
1Pass2: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
1RevTip: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
1L1RevTip: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
1Drag: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
1InsertWide: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
2Sweep: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
2Hit: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
2L1: Binary variable representing corner type: 1 = that corner type, 0 = other corner type
2R2: Binary variable representing corner type: 1 = that corner type, 0 = other corner type

Methodology: Linear regression with success as the dependent variable, and various independent variables included, i.e.:

```
logit_model <- glm(Success ~ MacyInsertion,
                   data = data, family = binomial)
```

See below for results!

<u>Results from various linear regressions:</u>

Variable Name	Coefficient(log-odds)	Odds Ratio	P(success)	p-value	Interpretation
MacyInsertion	0.9808	2.66	72%	0.2147	When Macy is at insert, our odds of success more than double, meaning that our probability of success increases by 22%. However, the p-value associated with this calculation is only significant at the 25% level, meaning that we can only be around 75% certain that the coefficient associated with Macy isn't 0. Compared to other estimates below, this p-value is quite high.
BarbInsertion	0.1178	1.12	53%	0.8865	When Barb is at insert, our odds of success increase slightly, meaning that our probability of success increases by 3%. However, the p-value associated with this calculation is only significant at the 90% level, meaning that we can only be around 10% certain that the coefficient associated with Barb isn't 0, potentially indicating that she isn't a large factor of corner success.
KiraInsertion	-16.91	4.4e-08	50.00008%	0.9941	When Kira is at insert, our odds of success increase slightly, meaning that our probability of success increases by 0.00008%. However, the p-value associated with this calculation indicates insignificance, indicating that Kira is not a large factor in corner success.
InsertionTime	-3.749	0.023	-2.35% (change)	0.280	A one unit increase in insertion time (1 second), decreases our probability of success by 2.35%. The p-value is only significant at the 30% level, indicating significance of this variable to corner success.
ReceptiontoRelease Time	0.0037	1.0037	0.37% (change)	0.990	A one unit increase in insertion time (1 second), increases our probability of success by 0.37%. However, the p-value associated with this calculation indicates insignificance, indicating that reception to release time is not a large factor in corner success.

My thoughts:

- We should be utilizing Macy, as she significantly increases our probability of success, and the coefficient associated with her insertion is significant, indicating that she is a key factor in corner success
- Although the coefficient associated with Barb isn't as significant, she still is able to increase our probability of success, meaning that she should be our second choice if Macy isn't in
- We should look to continue to cut down our insertion time, as this variable is significant in corner success rates