



Predicting League of Legends Match Outcomes

By Alex Clayton



Purpose of the Project

Attempt to see if a machine learning model can make accurate predictions of a very dynamic environment: esports



Training The Model

- CSVs of all match stats were sourced from Oracle's Elixir
- The model was trained with matches from the LCS (North American region)
- Only statistics relevant to the cause of the outcome were kept to prevent overfitting

	gameid	result	teamkills	teamdeaths	firstblood	gamelength	dpm	cspm
0	ESPORTSTMNT02_3140740	1	25	8	1.0	1954	3111.2794	31.3511
1	ESPORTSTMNT02_3140740	0	8	25	0.0	1954	2041.1054	30.2149

- Team statistics were joined on the game ID to be able to predict certain matchup results
- If team x won the match, the result would be 1. If team x lost the match, the result would be 0

	result_x	teamkills_x	teamdeaths_x	firstblood_x	gamelength_x	dpm_x	cspm_x	teamkills_y	teamdeaths_y	firstblood_y	gamelength_y	dpm_y	cspm_y
0	1	25	8	1.0	1954	3111.2794	31.3511	8	25	0.0	1954	2041.1054	30.2149

Training data accuracy: 0.973

Testing data accuracy: 0.952

	Predicted Loss	Predicted Win
Actual Loss	28	3
Actual Win	0	31

Predicting Results of Summer Qualifier Matches

- Only LCS data was used to prevent cross regional issues
- Data was averaged from all summer split matches and used to predict qualifying matches for the world championship

	teamkills	teamdeaths	firstblood	gamelength	dpm	cspm
teamname						
100 Thieves	9.315789	12.000000	0.421053	1880.894737	1916.057168	33.831432
Cloud9	14.315789	8.947368	0.526316	1682.947368	2254.321674	34.985121
Dignitas	12.157895	16.263158	0.421053	1989.315789	2195.070516	32.461621
Evil Geniuses	14.111111	11.388889	0.444444	1736.166667	2264.340150	33.632967
FlyQuest	11.777778	13.111111	0.611111	1879.333333	2024.137150	31.979472
Golden Guardians	15.315789	11.736842	0.631579	1939.842105	2363.479658	33.847868
Immortals	10.611111	15.722222	0.388889	1839.166667	2120.467928	31.560083
NRG	13.777778	13.722222	0.388889	2056.888889	2241.039656	31.903100
TSM	11.333333	12.055556	0.555556	1816.111111	1928.083483	32.525467
Team Liquid	14.833333	12.833333	0.611111	1952.611111	2542.255772	32.916394

Week 1 Predictions:

C9 vs GG: 1 - 0

TL vs TSM: 1 - 0

IMT vs DIG: 0 - 1

EG vs NRG: 1 - 0

FLY vs 100: 0 - 1

Week 1 Actual Results:

C9 vs GG: 1 - 0

TL vs TSM: 1 - 0

IMT vs DIG: 1 - 0

EG vs NRG: 1 - 0

FLY vs 100: 0 - 1

	Team	Games
1	 Cloud9 	13 - 5 72%
2	 Golden Guardians 	13 - 5 72%
3	 Evil Geniuses 	12 - 6 67%
4	 Team Liquid 	10 - 8 56%
5	 NRG 	9 - 9 50%
6	 TSM 	8 - 10 44%
7	 Dignitas 	7 - 11 39%
8	 100 Thieves 	7 - 11 39%
9	 FlyQuest 	6 - 12 33%
10	 Immortals 	5 - 13 28%

Predicting Final Team Standings

- The model correctly ordered nearly all teams correctly in relation to the actual ranking results
- 100 Thieves is an outlier, predicted to be tied for 5th place but in reality placing in 8th
- The model has TSM and Dignitas tied, but in reality are separated by a one game difference
- The inverse is true about Cloud9 and Golden Guardians

Predicted Ranking			
	Team	Wins	Losses
Rank			
1	Cloud9	9	0
2	Golden Guardians	8	1
3	Evil Geniuses	7	2
4	Team Liquid	6	3
5	100 Thieves	5	4
5	NRG	5	4
7	TSM	4	5
7	Dignitas	4	5
9	FlyQuest	3	6
10	Immortals	0	9

Actual Ranking				
	Team		Games	
1		Cloud9		13 - 5 72%
2		Golden Guardians		13 - 5 72%
3		Evil Geniuses		12 - 6 67%
4		Team Liquid		10 - 8 56%
5		NRG		9 - 9 50%
6		TSM		8 - 10 44%
7		Dignitas		7 - 11 39%
8		100 Thieves		7 - 11 39%
9		FlyQuest		6 - 12 33%
10		Immortals		5 - 13 28%

100 Thieves Outlier











Even though the model placed 100 Thieves higher than their actual results, in the matchups that the model predicted 100 Thieves would win in, 100 Thieves either won or was capable of winning.

Predicted Results vs:

C9: Loss
DIG: Win
EG: Loss
FLY: Win
GG: Loss
IMT: Win
NRG: Win
TL: Loss
TSM: Win

Actual Results vs:

C9: Loss
DIG: Tie
EG: Loss
FLY: Win
GG: Loss
IMT: Tie
NRG: Tie
TL: Loss
TSM: Win

								NRG		
		0 - 2	1 - 1	0 - 2	2 - 0	0 - 2	1 - 1	1 - 1	0 - 2	2 - 0

	Predicted Loss	Predicted Win
Actual Loss	28	3
Actual Win	0	31

Conclusions

- The model performed surprisingly well in predicting not only individual match results but also the overall performance of the North American Teams.
- Even for incorrect predictions, the model still displays accurate findings and logic.
- An extension onto this project would be to calculate a percentage likelihood of a team's chance to win to more accurately gauge even matchups.

Thanks for your time!