

data_collection

January 5, 2020

```
[156]: import time
import json
import requests
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import seaborn as sns
import statsmodels.api as sm
import datetime
import geopy.distance
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import classification_report
from sklearn.model_selection import train_test_split

from scipy import stats

sns.set(color_codes=True)

[3]: import warnings
warnings.filterwarnings('ignore')
```

1 Load Extra TFT Data

```
[160]: tft_items = None
tft_traits = None
tft_champs = None
with open('./tft_extra_data/items.json') as json_file:
    tft_items = json.load(json_file)

with open('./tft_extra_data/traits.json') as json_file:
    tft_traits = json.load(json_file)

with open('./tft_extra_data/champions.json') as json_file:
    tft_champs = json.load(json_file)
```

2 API Calls

```
[128]: URL = 'https://na1.api.riotgames.com/tft/league/v1/challenger'
api_key = 'RGAPI-a9c6b14d-2f84-4a3e-a7b8-df8f8b62da32'
headers = {'X-Riot-Token': api_key}
```

2.0.1 Initial Challenger Data Pull

```
[129]: # Initial Challenger Data Pull
response = requests.get(URL, headers=headers)

[14]: summoner_names = []
league_points = []
for entry in response.json()['entries']:
    summoner_names.append(entry['summonerName'])
    league_points.append(entry['leaguePoints'])

[34]: player_df = pd.DataFrame(data = {'summoner_name': summoner_names,
    → 'league_points': league_points})

[35]: player_df.sort_values(by=['league_points'], ascending=False, inplace=True)
player_df.reset_index(inplace=True)
player_df.drop(['index'], axis=1, inplace=True)

[57]: i = 0
player_uuids = []

[190]: player_df.head()

[190]:   summoner_name  league_points  \
0      GrandVice8           1334
1  DeliciousMilkGG           1207
2        Silliest           1113
3          Agon           1096
4          Krmx           1087

                                     puuid
0  OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...
1  PY8453ZFD178q0BN6ZsYU8m4U7E-4Sr2y6YcT51Neo0th-...
2  zdUfZ0_rhBEI-Gx6ai33CxZyCZymPuLOHvZEBSTAw762Lh...
3  Mtiy5xQq2B08E8UKrWt_AcHemRq40W5xJQKfC6wIONGMCJ...
4  VJQMuxGE5493waSe6PFxLrn2zPrQfMAi7ZDTBMwU7rXt3r...
```

2.0.2 Search users by Summoner Name

```
[70]: URL_name = 'https://na1.api.riotgames.com/tft/summoner/v1/summoners/by-name/'

for index in range(i+1, len(player_df['summoner_name'])):
    name = player_df.iloc[index]['summoner_name']
```

```

print(index, name)

response = requests.get(URL_name + name, headers=headers)

print(response.json()['puuid'])

player_uuids.append(response.json()['puuid'])
i = index

```

199 GreenbeingTFT
MmQ9S18WFQcAwNH1zAFuoiJeTKj9SOKYe6dl6Fe2YVuQkMvsNX3uHKYCM97gqlic-rHCiZE5czt4sQ

```
[72]: player_df['puuid'] = player_uuids
```

2.0.3 Get Last 10 Matches for each player

```
[119]: match_ids_df = pd.DataFrame(columns=['puuid', 'match_id'])
URL_match_ids = 'https://americas.api.riotgames.com/tft/match/v1/matches/
↳by-puuid/'
num_api_calls = 0
i = 0

[120]: for index in range(i, len(player_df['puuid'])):
        player_id = player_df.iloc[index]['puuid']
        if num_api_calls >= 100:
            time.sleep(120)
            num_api_calls = 0
        response = requests.get(URL_match_ids + player_id + '/ids?count=10',
↳headers=headers)
        num_api_calls += 1

        for match in response.json():
            match_ids_df = match_ids_df.append({'puuid': player_id, 'match_id':
↳match}, ignore_index=True)

        i = index

[191]: match_ids_df.head()
```

```
[191]:
```

		puuid	match_id
0	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249805878	
1	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249791129	
2	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249755964	
3	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249723025	
4	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249669510	

2.0.4 Get Game Data from Each Match

```
[165]: # Got match IDs
# Look up matches and obtain relevant information
# Only those with top 4 placings?
game_info_df = pd.DataFrame(columns=['puuid',
                                     'match_id',
                                     'game_length',
                                     'gold_left',
                                     'last_round',
                                     'level',
                                     'placement',
                                     'players_eliminated',
                                     'time_eliminated',
                                     'total_damage_to_players',
                                     'traits',
                                     'units'])

URL_game = 'https://americas.api.riotgames.com/tft/match/v1/matches/'
num_api_calls = 0

[189]: i = 1780

[187]: for index in range(i, len(match_ids_df['match_id'])):
    match_id = match_ids_df.iloc[index]['match_id']
    if num_api_calls >= 100:
        time.sleep(120)
        num_api_calls = 0
    response = requests.get(URL_game + match_id, headers=headers)
    num_api_calls += 1
    data = response.json()['info']
    game_len = data['game_length']

    for p in data['participants']:
        traits = []
        units = []
        for t in p['traits']:
            traits.append((t['name'], t['tier_current']))

        for u in p['units']:
            units.append((u['name'], u['rarity'], u['tier'], u['items']))

    game_info_df = game_info_df.append({'puuid': p['puuid'],
                                       'match_id': match_id,
                                       'game_length': game_len,
                                       'gold_left': p['gold_left'],
                                       'last_round': p['last_round'],
                                       'level': p['level'],
                                       'placement': p['placement'],
```

```

        'players_eliminated': p['players_eliminated'],
        'time_eliminated': p['time_eliminated'],
        'total_damage_to_players': 0
    } + p['total_damage_to_players'],
        'traits': traits,
        'units': units
    }, ignore_index=True)
print(len(game_info_df.index))
i = index

```

[192]: game_info_df

[192]:

		puuid	match_id	\
0	HbYsPpRS3X2RaQ8n5Sm9n2gKU80f927PzBk_krw4kdyRG6...	NA1_3249805878		
1	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249805878		
2	HGeDGOQrklxGiScizUCLq_BVn5gTYBy-Dld0uy38XcaKap...	NA1_3249805878		
3	VyCpwiJ3MifHEREwj0cSAXHQIjFGd7UtWMBG9ZvCd1Gso...	NA1_3249805878		
4	UsiShYgxH3X5_pNeJjE-EpBbR4vevorLcs83aI8ZSQFaZ...	NA1_3249805878		
5	BXPswgAxjGfAfQHvaF-m7CtUdbBvZQhcvilQzWZDyDZbDn...	NA1_3249805878		
6	zqelCdkKSSNGoCJA9msW7sP-wmzIWOHPG8b8ELUMwLCIM1...	NA1_3249805878		
7	BXZMHIfauv8M3Buaq06wZnxQXrN2f1WKj1GhJ6nNQeP3DD...	NA1_3249805878		
8	ELtY718rHfroXSGxxjTLh35qHtSQhlp2f4K50eq2x0tHbl...	NA1_3249791129		
9	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249791129		
10	7CqYYsxGsZ5yCgooHfKMcShi9qJ1h4gjb-H61TFCpRuBx1...	NA1_3249791129		
11	uLMm_x_6ph_C-L1AYDLzS88Ruwc6TqBsDYapwYNTbWJn46...	NA1_3249791129		
12	d5gbuTWsCgw8Xze47jXbij3o1Ey2TwyZm7_IcS8G3X96Gs...	NA1_3249791129		
13	VyCpwiJ3MifHEREwj0cSAXHQIjFGd7UtWMBG9ZvCd1Gso...	NA1_3249791129		
14	-hf2mVWWJCDuEIEKDi7qvUxNm3mhCrvSUMbH04jcHM--2...	NA1_3249791129		
15	BXPswgAxjGfAfQHvaF-m7CtUdbBvZQhcvilQzWZDyDZbDn...	NA1_3249791129		
16	Cb757Lc3yLQRcR0oGaLv7GBIko2vD-wKFp2yT6Z6aGh80...	NA1_3249755964		
17	xTLJWYzcx5vZvma2xJBmp0o-ofN7SYKL12XvpFRz4_ccFz...	NA1_3249755964		
18	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249755964		
19	iUS-RcMDCUMhYDBDM1sThFgkJwXHNQ6aNhv716BajKy82q...	NA1_3249755964		
20	acz8oHboYi6yRwDiCvTVQ55orAeIy_ZsXMXYWrbkgeWJ4-	NA1_3249755964		
21	UTvX5xUdkjlGuHsotV2bw81HIE8IpS479gwIz2tCzXuwxC...	NA1_3249755964		
22	83keLJ5z7LSu0FITP0yoSqXVfYMIUQ23CVL06u5vroR6iM...	NA1_3249755964		
23	bFQ1v3MkwLuFtOmmU1JgwQu-TE7w2Laa6ihU-zSSoqcXwL...	NA1_3249755964		
24	zbr4c6SUI4YOFj-nD-FKRvk-IiqfCaoU9BL8VHy6WaSvQR...	NA1_3249723025		
25	JJ4YJN9K9CeH39FTdLsXVdt-pBplZmC01FSLCs1N1IvNhI...	NA1_3249723025		
26	xTLJWYzcx5vZvma2xJBmp0o-ofN7SYKL12XvpFRz4_ccFz...	NA1_3249723025		
27	OkaQSLZuy-FUjgfc_a770gWAv0tn5WLYcBN7toyVLJsc1d...	NA1_3249723025		
28	bavEoaKXMnMKBLA2YrYjh3KsoSeI5zkrnbwSsq3v4K_0jp...	NA1_3249723025		
29	CRIB0kHN1T4RI5Ta5CzXLj4KKexoEPorovk4Z3WZM6EUow...	NA1_3249723025		
...	
16098	HGeDGOQrklxGiScizUCLq_BVn5gTYBy-Dld0uy38XcaKap...	NA1_3250353076		
16099	XzPazDGT19AkPBUagoVUIJMydAalltsZ2g40vvnvQTYeLxh...	NA1_3250353076		
16100	MmQ9S18WFQcAwNH1zAFuoiJeTKj9S0KYe6dl6Fe2YVuQkM...	NA1_3250353076		
16101	IgL-_yq-Y4s414rzLYkAmklegpqMEnQ4WafZwT2Qd2cimv...	NA1_3250353076		

16102	YHXpyLACMkqCEk4gSrIi0jKK7YtdAG1U48W1UhAehHbLDg...	NA1_3250353076
16103	05K7waYOKCutgqYr1MMprfz831SlgXGa6lrS2W4suedL60...	NA1_3250353076
16104	PR-tTH2hZ3EJ5je8hFBvwWuvb19Fw7jdfjlGwx63rDH-eW...	NA1_3250323581
16105	fNmfqNxUsbjKeCD27nlKZ81vgWaZKTX-cYKA6YI6gk3Bwr...	NA1_3250323581
16106	YHXpyLACMkqCEk4gSrIi0jKK7YtdAG1U48W1UhAehHbLDg...	NA1_3250323581
16107	iUS-RcMDCUMhYDBDM1sThFgkJWxHNQ6aNhv716BajKy82q...	NA1_3250323581
16108	HGeDGOQrklxGiScizUCLq_BVn5gTYBy-DldOuy38XcaKap...	NA1_3250323581
16109	XzPazDGT19AkPBUagoVUIJMydAalltsZ2g40vnnvQTYeLxh...	NA1_3250323581
16110	05K7waYOKCutgqYr1MMprfz831SlgXGa6lrS2W4suedL60...	NA1_3250323581
16111	MmQ9S18WFQcAwNH1zAFuoiJeTKj9S0KYe6dl6Fe2YVuQkM...	NA1_3250323581
16112	QHn9ZnZIK4fv2wXHIzXZ-bdeFhp_eJfR3L9GwfjB5hdkLz...	NA1_3250350213
16113	d_H5uS1dnw-o__OSbzBsWxz_XqEVHGbiAhBe72ZsBzIRsb...	NA1_3250350213
16114	RZM-dDsnLISwbDcTve90KbtTuHMQJoGz82jcJjqYbgCINX...	NA1_3250350213
16115	5GNrJC6Ckd3UfnSg_qrJTxFuDPBV0U7HHbg7tbggG2hzP...	NA1_3250350213
16116	fNmfqNxUsbjKeCD27nlKZ81vgWaZKTX-cYKA6YI6gk3Bwr...	NA1_3250350213
16117	MmQ9S18WFQcAwNH1zAFuoiJeTKj9S0KYe6dl6Fe2YVuQkM...	NA1_3250350213
16118	1lLj6xUNQMwh5tfPKvr6BeOVxebDGPFC3__1WTDji3-Ko...	NA1_3250350213
16119	Wnwf5-10yZz4KMzWFXyf4F3y0um3PLAQYwFhVg3lJe0Iko...	NA1_3250350213
16120	MmQ9S18WFQcAwNH1zAFuoiJeTKj9S0KYe6dl6Fe2YVuQkM...	NA1_3250317586
16121	PbfQPvquuqjo-QqLBsHkC4Wr4UFh93vVY5ziNI3Z1osRXr...	NA1_3250317586
16122	SasLQmBhDmPgMGH86n1qE5AJUyInL9bqkWC_5BXGh6xNFQ...	NA1_3250317586
16123	Wnwf5-10yZz4KMzWFXyf4F3y0um3PLAQYwFhVg3lJe0Iko...	NA1_3250317586
16124	EIJ_NWH9pBGcVNIKO_zV9awPZR_R85xuWDgR1Bdw8W92kY...	NA1_3250317586
16125	RZM-dDsnLISwbDcTve90KbtTuHMQJoGz82jcJjqYbgCINX...	NA1_3250317586
16126	B5zgCV4K76yCelCWNVncGHcj8KhDXhySnG-X5Vfg4hlIRX...	NA1_3250317586
16127	N-YmL87KG8xmxCelEvEmw-G3Fv52NluSJXyJ51ty08Cudr...	NA1_3250317586

	game_length	gold_left	last_round	level	placement	players_eliminated	\
0	1959.947266	5	31	8	4	0	
1	1959.947266	0	35	9	2	3	
2	1959.947266	0	31	7	5	0	
3	1959.947266	30	26	7	7	0	
4	1959.947266	4	33	8	3	0	
5	1959.947266	50	28	8	6	0	
6	1959.947266	8	24	7	8	0	
7	1959.947266	1	35	9	1	4	
8	2157.252197	2	35	8	2	2	
9	2157.252197	4	35	9	1	2	
10	2157.252197	7	26	7	8	0	
11	2157.252197	0	33	8	3	0	
12	2157.252197	0	27	8	6	0	
13	2157.252197	1	33	9	4	1	
14	2157.252197	21	26	8	7	0	
15	2157.252197	31	31	8	5	2	
16	1980.615112	2	35	8	1	1	
17	1980.615112	1	33	8	3	2	
18	1980.615112	0	35	9	2	1	

19	1980.615112	0	27	8	6	1
20	1980.615112	8	26	8	7	0
21	1980.615112	5	28	7	5	0
22	1980.615112	1	23	8	8	0
23	1980.615112	1	31	8	4	1
24	2291.703125	4	33	8	6	0
25	2291.703125	5	33	8	5	2
26	2291.703125	0	40	9	2	2
27	2291.703125	0	35	8	3	1
28	2291.703125	1	26	8	8	0
29	2291.703125	0	33	8	4	0
...
16098	2193.155029	0	37	8	3	0
16099	2193.155029	2	38	9	1	2
16100	2193.155029	1	28	8	7	0
16101	2193.155029	3	28	8	6	0
16102	2193.155029	0	30	8	5	0
16103	2193.155029	1	28	8	8	0
16104	2044.340698	0	24	7	7	0
16105	2044.340698	0	23	6	8	0
16106	2044.340698	2	33	8	5	0
16107	2044.340698	0	35	8	2	1
16108	2044.340698	3	35	8	1	3
16109	2044.340698	1	35	8	3	2
16110	2044.340698	2	34	9	4	0
16111	2044.340698	32	31	8	6	0
16112	2335.284668	0	26	8	7	0
16113	2335.284668	3	21	7	8	0
16114	2335.284668	2	40	8	1	3
16115	2335.284668	5	40	8	2	2
16116	2335.284668	1	37	9	3	1
16117	2335.284668	1	31	8	4	0
16118	2335.284668	1	28	8	6	0
16119	2335.284668	0	30	7	5	1
16120	2326.508789	1	34	8	4	2
16121	2326.508789	0	27	8	6	1
16122	2326.508789	21	26	8	8	0
16123	2326.508789	1	38	9	2	1
16124	2326.508789	4	30	8	5	1
16125	2326.508789	1	37	9	3	0
16126	2326.508789	2	38	9	1	1
16127	2326.508789	0	26	8	7	0

	time_eliminated	total_damage_to_players	\
0	1714.102783		95
1	1951.685059		146
2	1711.923218		72

3	1445.723633	55
4	1819.271362	129
5	1567.998779	80
6	1324.369019	31
7	1951.685059	176
8	2148.779785	122
9	2148.779785	195
10	1585.292358	52
11	2031.480591	82
12	1668.981689	81
13	2028.275146	99
14	1586.481201	46
15	1914.236206	100
16	1972.323975	164
17	1864.299683	121
18	1972.323975	172
19	1558.586304	75
20	1493.681030	60
21	1623.473511	88
22	1311.215210	20
23	1763.561646	134
24	1920.462646	98
25	1923.570923	117
26	2283.445068	162
27	2040.392944	107
28	1515.227783	61
29	1923.669922	82
...
16098	2127.694336	151
16099	2184.896973	179
16100	1607.773804	51
16101	1615.435425	69
16102	1707.682983	63
16103	1607.311401	76
16104	1409.981567	23
16105	1335.626343	13
16106	1916.374146	117
16107	2036.148438	162
16108	2036.148438	160
16109	2034.166992	136
16110	1975.792358	130
16111	1799.534546	86
16112	1516.047607	31
16113	1229.069702	23
16114	2326.928467	206
16115	2326.928467	157
16116	2131.669434	148

16117	1807.909912	120
16118	1642.102173	78
16119	1750.193726	80
16120	2078.058594	121
16121	1642.281250	49
16122	1565.966797	37
16123	2318.219727	168
16124	1814.613770	75
16125	2235.010986	143
16126	2318.219727	188
16127	1567.221802	47

	traits \
0	[(Berserker, 2), (Desert, 0), (Electric, 1), (...
1	[(Avatar, 1), (Electric, 3), (Inferno, 1), (Li...
2	[(Berserker, 0), (Desert, 2), (Inferno, 0), (M...
3	[(Inferno, 1), (Light, 0), (Mountain, 0), (Mys...
4	[(Avatar, 1), (Desert, 1), (Inferno, 0), (Meta...
5	[(Inferno, 1), (Light, 0), (Mage, 0), (Mystic,...
6	[(Desert, 1), (Inferno, 0), (Light, 0), (Metal...
7	[(Avatar, 1), (Crystal, 0), (Electric, 0), (In...
8	[(Desert, 1), (Metal, 1), (Mountain, 0), (Myst...
9	[(Avatar, 1), (Electric, 0), (Inferno, 0), (Li...
10	[(Berserker, 0), (Inferno, 1), (Light, 0), (Se...
11	[(Desert, 1), (Metal, 1), (Mountain, 0), (Myst...
12	[(Alchemist, 1), (Berserker, 2), (Desert, 0), ...
13	[(Avatar, 1), (Crystal, 0), (Inferno, 1), (Lig...
14	[(Desert, 0), (Inferno, 1), (Light, 0), (Mage,...
15	[(Inferno, 1), (Mage, 1), (Mountain, 1), (Myst...
16	[(Desert, 1), (Metal, 1), (Mountain, 0), (Myst...
17	[(Avatar, 1), (Berserker, 2), (Desert, 1), (El...
18	[(Avatar, 1), (Crystal, 0), (Inferno, 2), (Lig...
19	[(Desert, 1), (Inferno, 0), (Light, 0), (Mount...
20	[(Inferno, 1), (Light, 0), (Mystic, 1), (Ocean...
21	[(Inferno, 0), (Mage, 1), (Mountain, 1), (Ocea...
22	[(Alchemist, 1), (Berserker, 0), (Crystal, 1),...
23	[(Alchemist, 1), (Inferno, 0), (Light, 0), (Ma...
24	[(Alchemist, 1), (Berserker, 0), (Crystal, 1),...
25	[(Desert, 1), (Electric, 0), (Inferno, 0), (My...
26	[(Inferno, 2), (Mage, 0), (Mystic, 0), (Ocean...
27	[(Inferno, 1), (Light, 0), (Mage, 1), (Mountai...
28	[(Desert, 0), (Electric, 0), (Inferno, 0), (Li...
29	[(Inferno, 2), (Light, 0), (Mystic, 1), (Ocean...
...	...
16098	[(Inferno, 0), (Mage, 1), (Mountain, 1), (Myst...
16099	[(Desert, 0), (Electric, 0), (Inferno, 0), (Ma...
16100	[(Crystal, 0), (Electric, 1), (Inferno, 1), (O...

16101 [(Inferno, 1), (Light, 0), (Mystic, 1), (Ocean...
 16102 [(Inferno, 1), (Light, 0), (Mage, 0), (Mountai...
 16103 [(Alchemist, 1), (Crystal, 1), (Metal, 0), (My...
 16104 [(Inferno, 0), (Mage, 1), (Mountain, 1), (Myst...
 16105 [(Berserker, 0), (Light, 2), (Mystic, 1), (Set...
 16106 [(Crystal, 0), (Inferno, 1), (Mystic, 1), (Oce...
 16107 [(Inferno, 1), (Light, 0), (Mage, 0), (Mountai...
 16108 [(Desert, 1), (Inferno, 0), (Metal, 1), (Mysti...
 16109 [(Desert, 1), (Inferno, 0), (Metal, 1), (Mysti...
 16110 [(Alchemist, 1), (Avatar, 1), (Berserker, 2), ...
 16111 [(Avatar, 1), (Berserker, 2), (Crystal, 1), (D...
 16112 [(Alchemist, 1), (Berserker, 2), (Desert, 1), ...
 16113 [(Berserker, 1), (Desert, 1), (Electric, 1), (...
 16114 [(Avatar, 1), (Crystal, 0), (Inferno, 0), (Mag...
 16115 [(Desert, 1), (Metal, 1), (Mystic, 1), (Predat...
 16116 [(Alchemist, 1), (Berserker, 2), (Desert, 1), ...
 16117 [(Alchemist, 1), (Avatar, 1), (Crystal, 0), (I...
 16118 [(Desert, 0), (Inferno, 1), (Light, 0), (Mount...
 16119 [(Inferno, 1), (Light, 0), (Ocean, 0), (Set2_R...
 16120 [(Avatar, 1), (Berserker, 0), (Crystal, 0), (D...
 16121 [(Desert, 1), (Inferno, 1), (Mystic, 0), (Ocea...
 16122 [(Inferno, 2), (Mountain, 0), (Ocean, 0), (Set...
 16123 [(Desert, 1), (Electric, 0), (Inferno, 0), (Li...
 16124 [(Berserker, 0), (Inferno, 1), (Light, 0), (My...
 16125 [(Alchemist, 1), (Avatar, 1), (Berserker, 0), ...
 16126 [(Avatar, 1), (Electric, 0), (Inferno, 1), (Mo...
 16127 [(Berserker, 0), (Electric, 2), (Inferno, 0), ...

units

0 [(Renekton, 0, 2, []), (DrMundo, 2, 2, []), (S...
 1 [(Annie, 3, 2, []), (Zed, 4, 2, [24, 66, 16]),...
 2 [(Nocturne, 2, 2, [19, 19, 23]), (Sivir, 2, 2,...
 3 [(Kindred, 2, 2, [44, 22, 39]), (Malzahar, 1, ...
 4 [(Yasuo, 1, 2, []), (Sivir, 2, 2, [25, 46, 46])...
 5 [(Nami, 4, 1, [25, 57]), (Thresh, 1, 2, [67]),...
 6 [(Aatrox, 2, 2, []), (Nocturne, 2, 2, [19, 28,...
 7 [(Malphite, 3, 2, []), (Lux, 5, 1, []), (Brand...
 8 [(Qiyana, 2, 2, [34]), (Sivir, 2, 2, [46, 46])...
 9 [(Lux, 5, 2, [44, 44, 37]), (Malphite, 3, 2, [...
 10 [(Annie, 3, 1, [10202]), (Varus, 1, 2, []), (M...
 11 [(RekSai, 1, 2, [33, 8, 10202]), (Nocturne, 2,...
 12 [(Renekton, 0, 2, [10202]), (KogMaw, 0, 1, [])...
 13 [(Lux, 5, 1, [37, 58, 15]), (Syndra, 1, 1, [])...
 14 [(Brand, 3, 1, []), (Azir, 2, 2, []), (Nautilu...
 15 [(Taliyah, 0, 2, []), (Kindred, 2, 2, []), (Na...
 16 [(Nocturne, 2, 3, [28, 23, 11]), (Khazix, 3, 2...
 17 [(Jax, 1, 2, []), (Zed, 4, 1, [10202, 36]), (K...

```

18      [(Lux, 5, 2, [48, 13, 34]), (Yorick, 3, 2, [99...
19      [(Nami, 4, 1, [69, 37, 14]), (Soraka, 2, 1, []...
20      [(, 4, 1, []), (Zyra, 0, 2, [14, 37, 22]), (An...
21      [(Vladimir, 0, 2, []), (Qiyana, 2, 2, [2, 1020...
22      [(Twitch, 3, 1, []), (Ashe, 3, 1, [10202, 9]),...
23      [(Nautilus, 2, 2, []), (Nami, 4, 1, [67]), (Ja...
24      [(Twitch, 3, 2, [10203]), (Ashe, 3, 2, [24, 26...
25      [(Nami, 4, 1, []), (Azir, 2, 2, [10203]), (Qiy...
26      [(, 4, 1, [77]), (Varus, 1, 2, [17, 1, 12]), (...
27      [(Syndra, 1, 1, [10203]), (Yorick, 3, 2, [69, ...
28      [(Nami, 4, 1, []), (Soraka, 2, 1, [10203]), (Z...
29      [(Soraka, 2, 2, []), (Nami, 4, 1, [10203, 2, 3...
...
16098  [(Malphite, 3, 2, [15, 59, 25]), (Vladimir, 0,...
16099  [(Nami, 4, 2, []), (Zed, 4, 1, []), (Leblanc, ...
16100  [(Nautilus, 2, 1, []), (Annie, 3, 1, []), (Zed...
16101  [(Nami, 4, 1, []), (Qiyana, 2, 1, [14]), (Dian...
16102  [(Nautilus, 2, 1, []), (Soraka, 2, 1, []), (An...
16103  [(RekSai, 1, 1, []), (KogMaw, 0, 2, [34, 79, 3...
16104  [(Syndra, 1, 2, []), (Nami, 4, 1, [2]), (Taliy...
16105  [(Soraka, 2, 2, []), (Vayne, 0, 2, [12, 23, 24...
16106  [(Varus, 1, 2, []), (Nami, 4, 1, [28, 26]), (M...
16107  [(, 4, 1, [15, 4, 13]), (Brand, 3, 1, []), (An...
16108  [(Yasuo, 1, 2, []), (Nocturne, 2, 2, [28, 11, ...
16109  [(Yasuo, 1, 2, [67]), (MasterYi, 4, 1, []), (J...
16110  [(DrMundo, 2, 2, []), (Lux, 5, 2, [12]), (Sion...
16111  [(Lux, 5, 2, [13, 14, 26]), (Khazix, 3, 2, [10...
16112  [(Singed, 4, 1, [33]), (Renekton, 0, 2, []), (...
16113  [(Khazix, 3, 1, [4]), (Volibear, 1, 2, [10204]...
16114  [(Lux, 5, 2, [13]), (Brand, 3, 2, [37, 13, 23]...
16115  [(RekSai, 1, 2, [47, 79]), (MasterYi, 4, 2, [5...
16116  [(Janna, 3, 1, []), (Khazix, 3, 2, [89]), (Twi...
16117  [(Lux, 5, 1, [14, 26, 34]), (Nami, 4, 1, []), ...
16118  [(Annie, 3, 2, []), (Azir, 2, 2, []), (Zyra, 0...
16119  [(Varus, 1, 2, []), (Kindred, 2, 2, [44, 22, 6...
16120  [(Thresh, 1, 2, []), (Azir, 2, 2, [39]), (Lux,...
16121  [(Annie, 3, 1, [15]), (Azir, 2, 2, [3]), (Zyra...
16122  [(Diana, 0, 2, []), (Annie, 3, 2, []), (Kindre...
16123  [(Azir, 2, 2, []), (Malzahar, 1, 2, []), (Sora...
16124  [(Malzahar, 1, 2, [37]), (MasterYi, 4, 1, []),...
16125  [(Singed, 4, 2, [19, 77, 25]), (KogMaw, 0, 3, ...
16126  [(Zyra, 0, 2, [37, 22, 57]), (Nami, 4, 2, [37,...
16127  [(Soraka, 2, 2, []), (Volibear, 1, 1, []), (Ze...

```

[16128 rows x 12 columns]

```
[193]: game_info_df.to_csv('./complete_match_data.csv')  
match_ids_df.to_csv('./match_ids.csv')  
player_df.to_csv('./player_data.csv')
```