How does Gold affect game result

```python
import pandas as pd
import numpy as np
```

```python
dfgold = pd.read_csv('gold.csv')
cols = dfgold.columns
```

```python
goldtmp = pd.DataFrame(columns=cols)
```

```python
for i in range(30):
    goldtmp = goldtmp.append(dfgold.iloc[i])
goldtmp
```

	Address	Type	min_1	min_2	min_3	min_4	min_5	min_6	min_7	min_8	...	n
0	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-14	-65	-268	-431	-488	-789	...	
1	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-26	-18	147	237	-152	18	...	
2	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	10	-60	34	37	589	1064	...	
3	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-15	25	228	-6	-243	175	...	
4	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	40	40	44	-36	113	158	-121	-191	...	
5	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	20	-42	-48	-24	-219	-272	...	
6	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	13	-7	6	-353	-215	-795	-764	...	
7	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	26	91	-109	264	178	66	...	
8	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	-10	0	162	-269	-63	323	225	...	
9	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	68	498	210	283	311	...	
10	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	-10	-15	-274	-154	-49	134	122	...	
11	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	15	-91	-163	-45	-51	-192	...	
12	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	40	40	56	30	14	30	249	-126	...	
13	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	6	-532	-286	-533	-556	-1535	...	
14	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	708	460	753	874	907	...	
15	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	101	286	129	-59	1184	...	
16	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	10	-7	78	7	-146	206	75	...	
17	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	-230	-137	-142	-231	-196	...	
18	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	15	35	8	-117	33	758	725	...	
19	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	26	-26	-85	-63	-473	-1178	...	
20	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	8	8	87	82	-39	-39	197	...	
21	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	41	20	-101	21	226	410	...	
22	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	14	-373	-19	9	-38	18	...	
23	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	-5	-5	205	246	431	761	918	...	
24	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	-70	-182	-590	-153	-250	...	
25	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-8	50	745	777	1029	1360	...	

	Address	Type	min_1_0	min_2_0	min_3_28	min_4_32	min_5_114	min_6_139	min_7_390	min_8_507	...	n
26	http://matchhistory.na.leagueoflegends.com/en/...	golddiff										
27	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	10	48	279	2	-236	-12	-121	...	
28	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	517	519	680	422	698	1342	1848	...	
29	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	-53	-18	133	-318	-280	...	

30 rows × 97 columns

Cutting the dataframes

In [4]:

```
golds = []
# for i in range(len(dfgold[::7620])):
#     goldtmp = pd.DataFrame(columns=cols)
#     for j in range(7620):
#         goldtmp = goldtmp.append(dfgold.iloc[j])
#     golds.append(goldtmp)
#THIS IS SO SLOW LOOPING DF IS BAD IDEA
```

In [5]:

```
num = 0
for i in range(7620,len(dfgold)+1,7620):
    print(num, i)
    golds.append(dfgold[num:i])
    num = i
```

```
0 7620
7620 15240
15240 22860
22860 30480
30480 38100
38100 45720
45720 53340
53340 60960
60960 68580
68580 76200
76200 83820
83820 91440
91440 99060
```

Write files out to csv

In [73]:

```
for df in golds:
    #df = df.fillna(0)
    file_name = df.iloc[0].Type
    df.to_csv(file_name+".csv")
```

In [6]:

```
golds[0]
```

Out[6]:

	Address	Type	min_1	min_2	min_3	min_4	min_5	min_6	min_7	min_8	...
0	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-14	-65	-268	-431	-488	-789	...
1	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-26	-18	147	237	-152	18	...
2	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	10	-60	34	37	589	1064	...
3	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-15	25	228	-6	-243	175	...

	Address	Type	min_1	min_2	min_3	min_4	min_5	min_6	min_7	min_8	...
4	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	40	40	44	-36	113	158	-121	-191	...
5	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	20	-42	-48	-24	-219	-272	...
6	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	13	-7	6	-353	-215	-795	-764	...
7	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	26	91	-109	264	178	66	...
8	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	-10	0	162	-269	-63	323	225	...
9	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	68	498	210	283	311	...
10	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	-10	-15	-274	-154	-49	134	122	...
11	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	15	-91	-163	-45	-51	-192	...
12	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	40	40	56	30	14	30	249	-126	...
13	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	6	-532	-286	-533	-556	-1535	...
14	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	708	460	753	874	907	...
15	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	101	286	129	-59	1184	...
16	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	10	-7	78	7	-146	206	75	...
17	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	-230	-137	-142	-231	-196	...
18	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	15	35	8	-117	33	758	725	...
19	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	26	-26	-85	-63	-473	-1178	...
20	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	8	8	87	82	-39	-39	197	...
21	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	41	20	-101	21	226	410	...
22	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	14	-373	-19	9	-38	18	...
23	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	-5	-5	205	246	431	761	918	...
24	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	-70	-182	-590	-153	-250	...
25	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	-8	50	745	777	1029	1360	...
26	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	28	32	114	139	390	507	...
27	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	10	48	279	2	-236	-12	-121	...
28	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	517	519	680	422	698	1342	1848	...
29	http://matchhistory.na.leagueoflegends.com/en/...	golddiff	0	0	0	-53	-18	133	-318	-280	...
...	...	...	...	...	...	...	...	...	...	...	...
7590	https://matchhistory.euw.leagueoflegends.com/e...	golddiff	0	0	0	77	100	98	-72	-59	...
7591	https://matchhistory.euw.leagueoflegends.com/e...	golddiff	0	0	-7	-351	-373	-560	-207	-528	...
7592	https://matchhistory.euw.leagueoflegends.com/e...	golddiff	0	0	-1	-148	-115	-905	-841	-483	...
7593	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	204	314	716	1181	1053	1002	...
7594	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-90	105	78	-353	-141	96	...
7595	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-74	-595	-641	-868	-994	-195	...
7596	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	161	-35	-137	-228	-3	71	...
7597	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	14	136	-199	-310	-195	-149	...
7598	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	5	-145	49	-39	-371	-327	-942	...
7599	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	49	-38	15	-31	219	1282	...
7600	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-2	-152	307	-31	-137	-119	...
7601	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	-5	-26	114	29	101	-394	-680	...
7602	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-22	25	135	37	649	315	...
7603	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	47	359	625	571	667	318	...
7604	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	114	434	-424	-710	-418	-447	...
7605	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-38	34	64	294	220	-10	...
7606	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-32	18	-224	300	695	990	...
7607	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	29	-157	-83	-85	53	-17	...

	Address	Type	min_1	min_2	min_3	min_4	min_5	min_6	min_7	min_8	
7608	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	150	71	-240	-453	76	341	...
7609	https://matchhistory.br.leagueoflegends.com/pt...	golddiff	0	13	45	-67	-4	147	86	53	...
7610	https://matchhistory.br.leagueoflegends.com/pt...	golddiff	0	0	-14	-184	35	-248	-552	-521	...
7611	https://matchhistory.br.leagueoflegends.com/pt...	golddiff	0	0	70	437	490	478	384	1093	...
7612	https://matchhistory.br.leagueoflegends.com/pt...	golddiff	0	0	34	-152	-422	-182	-367	-123	...
7613	https://matchhistory.br.leagueoflegends.com/pt...	golddiff	0	0	37	305	716	529	739	646	...
7614	https://matchhistory.euw.leagueoflegends.com/e...	golddiff	0	-8	-187	-37	-92	-164	-229	-424	...
7615	https://matchhistory.euw.leagueoflegends.com/e...	golddiff	0	0	-18	-95	45	-87	-117	199	...
7616	https://matchhistory.euw.leagueoflegends.com/e...	golddiff	0	0	-86	-39	-207	-349	-60	-140	...
7617	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	-8	-6	116	103	-92	-470	-958	...
7618	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-97	33	351	284	299	263	...
7619	https://matchhistory.na.leagueoflegends.com/en...	golddiff	0	0	-8	-225	-36	73	464	184	...

7620 rows × 97 columns
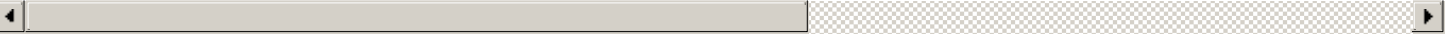
In [7]:

```
len(golds)
```

Out[7]:

13

In [44]:

```
kill = pd.read_csv('kills.csv')
kill.iloc[0].Address
```

Out[44]:

'http://matchhistory.na.leagueoflegends.com/en/#match-details/TRLH1/30030?gameHash=fbb300951ad8327c'

In [53]:

```
kill.loc[kill.Address == "http://matchhistory.na.leagueoflegends.com/en/#match-details/TRLH1/30030?gameHash=fbb300951ad8327c"]
```

Out[53]:

	Address	Team	Time	Victim	Killer	Assist_1	Assist_2	
0	http://matchhistory.na.leagueoflegends.com/en/...	bKills	10.820	C9 Hai	TSM Bjergsen	NaN	NaN	
1	http://matchhistory.na.leagueoflegends.com/en/...	bKills	16.286	C9 LemonNation	TSM WildTurtle	TSM Santorin	TSM Bjergsen	TSM
2	http://matchhistory.na.leagueoflegends.com/en/...	bKills	18.733	C9 Hai	TSM Bjergsen	TSM Santorin	TSM WildTurtle	TSM
3	http://matchhistory.na.leagueoflegends.com/en/...	bKills	18.880	C9 Meteos	TSM Dyrus	TSM Santorin	TSM Bjergsen	
4	http://matchhistory.na.leagueoflegends.com/en/...	bKills	27.005	C9 Balls	TSM Bjergsen	TSM Dyrus	TSM Santorin	
5	http://matchhistory.na.leagueoflegends.com/en/...	bKills	27.029	C9 LemonNation	TSM Dyrus	TSM Bjergsen	TSM WildTurtle	TSM
6	http://matchhistory.na.leagueoflegends.com/en/...	bKills	27.109	C9 Hai	TSM WildTurtle	TSM Dyrus	TSM Santorin	
7	http://matchhistory.na.leagueoflegends.com/en/...	bKills	28.989	C9 LemonNation	TSM Bjergsen	TSM Dyrus	TSM Santorin	
8	http://matchhistory.na.leagueoflegends.com/en/...	bKills	29.073	C9 Balls	TSM Bjergsen	TSM Dyrus	TSM Santorin	

	Address	Team	Time	Victim	TSM Killer WildTurtle	TSM Assist_1 Santorin	TSM Assist_2 Bjergsen	TSM
9	http://matchhistory.na.leagueoflegends.com/...	bKills	30.104	C9 Balls				
10	http://matchhistory.na.leagueoflegends.com/en/...	bKills	32.801	C9 Hai	TSM Santorin	TSM Bjergsen	TSM WildTurtle	TSM
11	http://matchhistory.na.leagueoflegends.com/en/...	bKills	32.850	C9 Balls	TSM Bjergsen	TSM Santorin	TSM WildTurtle	TSM
12	http://matchhistory.na.leagueoflegends.com/en/...	bKills	33.017	C9 LemonNation	TSM Bjergsen	TSM Dyrus	TSM Santorin	W
13	http://matchhistory.na.leagueoflegends.com/en/...	bKills	38.889	C9 Meteos	TSM Bjergsen	TSM Dyrus	TSM Santorin	W
14	http://matchhistory.na.leagueoflegends.com/en/...	bKills	38.906	C9 LemonNation	TSM WildTurtle	TSM Dyrus	TSM Santorin	
15	http://matchhistory.na.leagueoflegends.com/en/...	bKills	38.964	C9 Sneaky	TSM WildTurtle	TSM Dyrus	TSM Santorin	
98342	http://matchhistory.na.leagueoflegends.com/en/...	rKills	16.529	TSM Lustboy	C9 Balls	C9 Meteos	C9 Hai	C
98343	http://matchhistory.na.leagueoflegends.com/en/...	rKills	16.791	TSM Dyrus	C9 Meteos	C9 Balls	C9 Hai	C
98344	http://matchhistory.na.leagueoflegends.com/en/...	rKills	18.784	TSM Santorin	C9 Sneaky	C9 Meteos	C9 LemonNation	
98345	http://matchhistory.na.leagueoflegends.com/en/...	rKills	27.073	TSM Santorin	C9 Sneaky	C9 Balls	C9 Hai	Lem
98346	http://matchhistory.na.leagueoflegends.com/en/...	rKills	29.983	TSM Santorin	C9 Hai	C9 Balls	C9 Meteos	C
98347	http://matchhistory.na.leagueoflegends.com/en/...	rKills	30.115	TSM Dyrus	C9 Sneaky	C9 Balls	C9 Meteos	
98348	http://matchhistory.na.leagueoflegends.com/en/...	rKills	32.867	TSM Dyrus	C9 Sneaky	C9 Balls	C9 Meteos	Lem
98349	http://matchhistory.na.leagueoflegends.com/en/...	rKills	32.917	TSM Santorin	C9 Sneaky	C9 Balls	C9 LemonNation	
98350	http://matchhistory.na.leagueoflegends.com/en/...	rKills	38.866	TSM Santorin	C9 Sneaky	C9 Balls	C9 Meteos	

In [9]:

```
loldf = pd.read_csv('LeagueofLegends.csv')
len(loldf)
```

Out[9]:

```
7620
```

Prepare training data

In [10]:

```
labels = loldf.bResult
```

In [61]:

```
#write out labels to csv
labels.to_csv("labels.csv")
```

In [11]:

```
def dropper(df):
    cols = df.columns
    for i in range(3):
        df = df.drop(cols[i], 1)
    return df
```

```
In [59]:
```

```
teamdiff = pd.read_csv('golddiff.csv')
teamdiff = dropper(teamdiff)
```

```
In [15]:
```

```
from xgboost import XGBClassifier
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
```

```
In [60]:
```

```
#diff = diff.values
teamdiff.shape
```

```
Out[60]:
```

```
(7620, 95)
```

```
In [17]:
```

```
labels = labels.values
```

Prepare pred data (team difference)

```
In [136]:
```

```
%matplotlib inline
from matplotlib import pyplot
```

```
In [61]:
```

```
teamdiff_train = teamdiff[:7000]
labels_train = labels[:7000]

teamdiff_test = teamdiff[7000:]
labels_test = labels[7000:]
```

```
In [62]:
```

```
model = XGBClassifier()
model.fit(teamdiff_train, labels_train)
```

```
Out[62]:
```

```
XGBClassifier(base_score=0.5, booster='gbtree', colsample_bylevel=1,
       colsample_bytree=1, gamma=0, learning_rate=0.1, max_delta_step=0,
       max_depth=3, min_child_weight=1, missing=None, n_estimators=100,
       n_jobs=1, nthread=None, objective='binary:logistic', random_state=0,
       reg_alpha=0, reg_lambda=1, scale_pos_weight=1, seed=None,
       silent=True, subsample=1)
```

```
In [20]:
```

```
print(model)
```

```
XGBClassifier(base_score=0.5, booster='gbtree', colsample_bylevel=1,
       colsample_bytree=1, gamma=0, learning_rate=0.1, max_delta_step=0,
       max_depth=3, min_child_weight=1, missing=None, n_estimators=100,
       n_jobs=1, nthread=None, objective='binary:logistic', random_state=0,
       reg_alpha=0, reg_lambda=1, scale_pos_weight=1, seed=None,
       silent=True, subsample=1)
```

```
In [63]:
```

```
#predictions
y_pred_team = model.predict(teamdiff_test)
predictions = [round(value) for value in y_pred_team]
```

/anaconda3/lib/python3.6/site-packages/sklearn/preprocessing/label.py:151: DeprecationWar

In [79]:

Out[79]:

```
array([1, 0, 1, 0, 0, 0, 1, 0, 1, 1, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0, 1, 1,
       1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 0, 0,
       0, 0, 0, 0, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0,
       1, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 1, 1, 1, 1, 1, 0, 1, 1, 1,
       1, 0, 1, 0, 1, 1, 1, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 1, 1, 1, 1, 0,
       1, 0, 1, 0, 1, 1, 0, 1, 1, 1, 0, 0, 1, 0, 0, 1, 1, 0, 1, 1, 0, 0,
       1, 0, 1, 1, 0, 1, 1, 0, 1, 0, 1, 1, 0, 1, 0, 0, 1, 1, 1, 1, 1, 0,
       1, 0, 1, 0, 1, 0, 1, 0, 0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0,
       0, 1, 1, 0, 1, 1, 0, 0, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 1, 0, 1, 0,
       0, 1, 0, 1, 0, 0, 1, 0, 0, 1, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 0, 0,
       1, 0, 0, 1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 0, 1, 1, 1, 0, 1, 0, 0, 0,
       0, 1, 0, 0, 0, 1, 1, 1, 0, 0, 1, 1, 0, 0, 1, 0, 0, 1, 1, 1, 0, 1,
       1, 0, 1, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 0, 0, 1, 0, 1, 0, 0,
       0, 0, 1, 0, 1, 1, 0, 1, 1, 1, 1, 0, 1, 1, 1, 1, 0, 1, 0, 1, 1, 0,
       1, 1, 0, 1, 0, 0, 0, 1, 0, 0, 1, 1, 1, 0, 0, 1, 1, 0, 0, 1, 1, 0,
       1, 1, 0, 1, 1, 1, 0, 0, 0, 1, 0, 1, 1, 0, 0, 1, 0, 0, 1, 0, 1, 1,
       0, 1, 0, 0, 0, 0, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 1, 0, 1, 1, 1, 0,
       1, 0, 1, 0, 1, 0, 0, 0, 1, 1, 1, 1, 1, 1, 0, 0, 0, 1, 0, 0, 0, 0,
       0, 0, 1, 0, 1, 1, 0, 0, 0, 1, 0, 1, 1, 0, 1, 0, 1, 1, 1, 1, 0, 1,
       0, 0, 0, 0, 1, 1, 1, 0, 1, 0, 1, 0, 1, 1, 0, 0, 0, 0, 1, 0, 1, 1,
       1, 0, 1, 1, 0, 0, 1, 0, 0, 1, 0, 0, 1, 0, 1, 1, 0, 1, 1, 0, 0, 1,
       0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 0,
       1, 0, 1, 0, 1, 0, 1, 0, 1, 1, 1, 0, 1, 1, 0, 1, 1, 0, 1, 1, 0, 1,
       1, 0, 0, 1, 1, 0, 1, 0, 1, 1, 1, 1, 1, 0, 1, 1, 1, 0, 1, 1, 1, 1,
       1, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, 1, 1, 0, 1, 0, 1, 0, 0, 1, 0, 1,
       0, 1, 1, 0, 0, 1, 1, 1, 0, 0, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 1, 0,
       1, 1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 1, 1,
       0, 1, 1, 1, 0, 1, 1, 0, 1, 1, 1, 0, 1, 1, 0, 0, 1, 1, 1, 1, 0, 0,
       1, 0, 1, 0])
```

In [64]:

```
accuracy = accuracy_score(labels_test, predictions)
print("Accuracy: %.2f%%" % (accuracy * 100.0))
```

Accuracy: 90.32%

Calling in data for each lanes

In [24]:

```
topdiff = pd.read_csv("topdiff.csv")
jgdiff = pd.read_csv("jgdiff.csv")
middiff = pd.read_csv("middiff.csv")
adcdiff = pd.read_csv("adcdiff.csv")
supdiff = pd.read_csv("supdiff.csv")
```

In [27]:

```
topdiff = topdiff.drop(topdiff.columns[0], 1)
jgdiff = jgdiff.drop(jgdiff.columns[0], 1)
middiff = middiff.drop(middiff.columns[0], 1)
adcdiff = adcdiff.drop(adcdiff.columns[0], 1)
supdiff = supdiff.drop(supdiff.columns[0], 1)
```

Valuetype as nparray

In [29]:

```
topdiff = topdiff.values
jgdiff = jgdiff.values
middiff = middiff.values
adcdiff = adcdiff.values
supdiff = supdiff.values
```

prepare traindata for all positions

In [40]:

```
topdiff_train = topdiff[:7000]
jgdiff_train = jgdiff[:7000]
middiff_train = middiff[:7000]
adcdiff_train = adcdiff[:7000]
supdiff_train = supdiff[:7000]
```

prepare testdata for all positions

In [ ]:

```
topdiff_test = topdiff[7000:]
jgdiff_test = jgdiff[7000:]
middiff_test = middiff[7000:]
adcdiff_test = adcdiff[7000:]
supdiff_test = supdiff[7000:]
```

Train all positions data

In [41]:

```
model_top = XGBClassifier()
model_top.fit(topdiff_train, labels_train)

model_jg = XGBClassifier()
model_jg.fit(jgdiff_train, labels_train)

model_mid = XGBClassifier()
model_mid.fit(middiff_train, labels_train)

model_adc = XGBClassifier()
model_adc.fit(adcdiff_train, labels_train)

model_sup = XGBClassifier()
model_sup.fit(supdiff_train, labels_train)
```

Out[41]:

```
XGBClassifier(base_score=0.5, booster='gbtree', colsample_bylevel=1,
       colsample_bytree=1, gamma=0, learning_rate=0.1, max_delta_step=0,
       max_depth=3, min_child_weight=1, missing=None, n_estimators=100,
       n_jobs=1, nthread=None, objective='binary:logistic', random_state=0,
       reg_alpha=0, reg_lambda=1, scale_pos_weight=1, seed=None,
       silent=True, subsample=1)
```

In [147]:

```
middiff_train.shape
```

Out[147]:

```
(7000, 95)
```

In [39]:

```
from sklearn.ensemble import VotingClassifier
model_vote = VotingClassifier(estimators=[('xgb, model'),('xgb, model_top'),('xgb, model
_jg'),('xgb, model_mid'),('xgb, model_adc'),('xgb, model_sup')])
```

```
/anaconda3/lib/python3.6/site-packages/sklearn/ensemble/weight_boosting.py:29: Deprecatio
nWarning: numpy.core.umath_tests is an internal NumPy module and should not be imported.
It will be removed in a future NumPy release.
  from numpy.core.umath_tests import inner1d
```

In [57]:

```python
topdiff_test.shape
```

Out[57]:

```
(620, 95)
```

Get the probability from all positions

In [65]:

```python
pred_team = model.predict_proba(teamdiff_test)
pred1 = model_top.predict_proba(topdiff_test)
pred2 = model_top.predict_proba(jgdiff_test)
pred3 = model_top.predict_proba(middiff_test)
pred4 = model_top.predict_proba(adcdiff_test)
pred5 = model_top.predict_proba(supdiff_test)

finalpred = (pred_team+pred1+pred2+pred3+pred4+pred5)/6
```

In [90]:

```python
for i in range(20):
    print(type(finalpred))
    print(finalpred[i], labels_test[i])
```

```
<class 'numpy.ndarray'>
[0.15002677 0.84997326] 1
<class 'numpy.ndarray'>
[0.84025806 0.15974195] 0
<class 'numpy.ndarray'>
[0.30071023 0.69928974] 1
<class 'numpy.ndarray'>
[0.9620684  0.03793167] 0
<class 'numpy.ndarray'>
[0.78114057 0.21885943] 0
<class 'numpy.ndarray'>
[0.77126926 0.22873081] 0
<class 'numpy.ndarray'>
[0.06447401 0.93552595] 1
<class 'numpy.ndarray'>
[0.8821864  0.11781359] 0
<class 'numpy.ndarray'>
[0.44177246 0.5582276 ] 0
<class 'numpy.ndarray'>
[0.21970455 0.7802954 ] 1
<class 'numpy.ndarray'>
[0.7205525  0.27944747] 0
<class 'numpy.ndarray'>
[0.20495689 0.7950432 ] 1
<class 'numpy.ndarray'>
[0.5652699  0.43473014] 0
<class 'numpy.ndarray'>
[0.31049597 0.6895041 ] 1
<class 'numpy.ndarray'>
[0.65723103 0.342769  ] 0
<class 'numpy.ndarray'>
[0.92204905 0.07795087] 0
<class 'numpy.ndarray'>
[0.21228151 0.7877185 ] 1
<class 'numpy.ndarray'>
[0.5905222  0.40947774] 0
<class 'numpy.ndarray'>
[0.59311616 0.40688384] 0
<class 'numpy.ndarray'>
```

```
[0.86614066 0.13385938] 0
```

Get the accuracy

```python
predictions = []
for row in finalpred:
    predictions.append(round(row[1]))
    #[round(value) for value in y_pred_team]
accuracy = accuracy_score(labels_test, predictions)
print("Accuracy: %.2f%%" % (accuracy * 100.0))
```

```
Accuracy: 90.00%
```

Prediction every minute update

```python
#initialize empty columns for stacking
finalpreds = []
n = topdiff.shape[0]
teamcol = np.empty((n, 0))
topcol = np.empty((n, 0))
jgcol = np.empty((n, 0))
midcol = np.empty((n, 0))
adccol = np.empty((n, 0))
supcol = np.empty((n, 0))
```

```python
for i in range(topdiff.shape[1]):
    team = np.matrix(teamdiff).T[i].T
    top = np.matrix(topdiff).T[i].T
    jg = np.matrix(jgdiff).T[i].T
    mid = np.matrix(middiff).T[i].T
    adc = np.matrix(adcdiff).T[i].T
    sup = np.matrix(supdiff).T[i].T

    teamcol = np.hstack((teamcol, team))
    topcol = np.hstack((topcol, top))
    jgcol = np.hstack((jgcol, jg))
    midcol = np.hstack((midcol, mid))
    adccol = np.hstack((adccol, adc))
    supcol = np.hstack((supcol, sup))

    teamcol_train = teamcol[:7000]
    topcol_train = topcol[:7000]
    jgcol_train = jgcol[:7000]
    midcol_train = midcol[:7000]
    adccol_train = adccol[:7000]
    supcol_train = supcol[:7000]

    teamcol_test = teamcol[7400]
    topcol_test = topcol[7400]
    jgcol_test = jgcol[7400]
    midcol_test = midcol[7400]
    adccol_test = adccol[7400]
    supcol_test = supcol[7400]

    model_team = XGBClassifier()
    model_team.fit(teamcol_train, labels_train)

    model_top = XGBClassifier()
    model_top.fit(topcol_train, labels_train)

    model_jg = XGBClassifier()
    model_jg.fit(jgcol_train, labels_train)
```

```python
    model_mid = XGBClassifier()
    model_mid.fit(midcol_train, labels_train)

    model_adc = XGBClassifier()
    model_adc.fit(adccol_train, labels_train)

    model_sup = XGBClassifier()
    model_sup.fit(supcol_train, labels_train)

    pred_team = model_team.predict_proba(teamcol_test)
    pred1 = model_top.predict_proba(topcol_test)
    pred2 = model_top.predict_proba(jgcol_test)
    pred3 = model_top.predict_proba(midcol_test)
    pred4 = model_top.predict_proba(adccol_test)
    pred5 = model_top.predict_proba(supcol_test)

    finalpred = (pred_team+pred1+pred2+pred3+pred4+pred5)/6

    finalpreds.append(finalpred)

for m in finalpreds:
    print(m)
```

```
[[0.45483455 0.5451655 ]]
[[0.45253208 0.5474679 ]]
[[0.46757433 0.5324257 ]]
[[0.46001396 0.5399861 ]]
[[0.49391094 0.50608903]]
[[0.5059267  0.49407327]]
[[0.522547   0.47745296]]
[[0.50920314 0.4907969 ]]
[[0.5171159  0.48288408]]
[[0.48223463 0.51776546]]
[[0.45357886 0.5464211 ]]
[[0.3751011 0.6248989]]
[[0.37679383 0.6232062 ]]
[[0.36899248 0.6310075 ]]
[[0.38914457 0.6108554 ]]
[[0.41183138 0.5881686 ]]
[[0.3995633 0.6004366]]
[[0.42925707 0.5707429 ]]
[[0.5283794  0.47162068]]
[[0.51898766 0.48101237]]
[[0.533789   0.46621096]]
[[0.515418   0.48458204]]
[[0.5224066 0.4775935]]
[[0.5041383  0.49586174]]
[[0.50188595 0.49811408]]
[[0.4363544 0.5636456]]
[[0.4210899 0.5789101]]
[[0.40127707 0.5987229 ]]
[[0.32081375 0.67918634]]
[[0.28764513 0.7123549 ]]
[[0.24879551 0.7512045 ]]
[[0.3422483  0.65775174]]
[[0.3495244 0.6504756]]
[[0.36544046 0.63455963]]
[[0.36450186 0.6354981 ]]
[[0.36863494 0.63136506]]
[[0.3570045 0.6429955]]
[[0.35916615 0.64083385]]
[[0.3730515  0.62694854]]
[[0.35406542 0.6459345 ]]
[[0.34967837 0.65032166]]
[[0.35778275 0.6422172 ]]
[[0.35909176 0.6409083 ]]
[[0.36187318 0.6381268 ]]
[[0.36652794 0.633472  ]]
[[0.36490843 0.6350916 ]]
[[0.368366   0.63163394]]
[[0.36454475 0.6354553 ]]
[[0.3534616  0.64653844]]
```

```
[[0.3650937  0.63490623]]
[[0.36288223 0.63711774]]
[[0.3699428  0.63005716]]
[[0.36824024 0.6317598 ]]
[[0.37017715 0.62982285]]
[[0.3704063 0.6295937]]
[[0.37167522 0.6283248 ]]
[[0.37167522 0.6283248 ]]
[[0.37167522 0.6283248 ]]
[[0.37218857 0.62781143]]
[[0.36847126 0.6315288 ]]
[[0.36847126 0.6315288 ]]
[[0.36847126 0.6315288 ]]
[[0.36847126 0.6315288 ]]
[[0.3692645  0.63073546]]
[[0.3692666 0.6307334]]
[[0.3692666 0.6307334]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
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[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
[[0.36598054 0.63401943]]
```

In [165]:

```python
ddd = []
for i in range(31):
    ddd.append(finalpreds[i][0][0])
```

In [167]:

```python
dididi = {"prob": ddd}
print(dididi)
```

```
{'prob': [0.45483455, 0.45253208, 0.46757433, 0.46001396, 0.49391094, 0.5059267, 0.522547
, 0.50920314, 0.5171159, 0.48223463, 0.45357886, 0.3751011, 0.37679383, 0.36899248, 0.389
14457, 0.41183138, 0.3995633, 0.42925707, 0.5283794, 0.51898766, 0.533789, 0.515418, 0.52
24066, 0.5041383, 0.50188595, 0.4363544, 0.4210899, 0.40127707, 0.32081375, 0.28764513, 0
.24879551]}
```

Training model with kills

In [176]:

```python
loldf.iloc[7400].rKills
```

Out[176]:

"[[13.926, 'S04 Memento', 'GIA Jiizuke', ['GIA Gilius', 'GIA Minitroupax', 'GIA Jactroll'], 7070, 7203], [17.526, 'S04 Caedrel', 'GIA Minitroupax', ['GIA Jiizuke', 'GIA Jactroll'], 9992, 1134]]"

In [171]:

```
kills = pd.read_csv('kills.csv')
kills.Address[0]
```

Out[171]:

'http://matchhistory.na.leagueoflegends.com/en/#match-details/TRLH1/30030?gameHash=fbb300951ad8327c'

In [172]:

```
kills.loc[kills['Address'] == 'http://matchhistory.na.leagueoflegends.com/en/#match-details/TRLH1/30030?gameHash=fbb300951ad8327c']
```

Out[172]:

	Address	Team	Time	Victim	Killer	Assist_1	Assist_2	
0	http://matchhistory.na.leagueoflegends.com/en/...	bKills	10.820	C9 Hai	TSM Bjergsen	NaN	NaN	
1	http://matchhistory.na.leagueoflegends.com/en/...	bKills	16.286	C9 LemonNation	TSM WildTurtle	TSM Santorin	TSM Bjergsen	TSM
2	http://matchhistory.na.leagueoflegends.com/en/...	bKills	18.733	C9 Hai	TSM Bjergsen	TSM Santorin	TSM WildTurtle	TSM
3	http://matchhistory.na.leagueoflegends.com/en/...	bKills	18.880	C9 Meteos	TSM Dyrus	TSM Santorin	TSM Bjergsen	V
4	http://matchhistory.na.leagueoflegends.com/en/...	bKills	27.005	C9 Balls	TSM Bjergsen	TSM Dyrus	TSM Santorin	V
5	http://matchhistory.na.leagueoflegends.com/en/...	bKills	27.029	C9 LemonNation	TSM Dyrus	TSM Bjergsen	TSM WildTurtle	TSM
6	http://matchhistory.na.leagueoflegends.com/en/...	bKills	27.109	C9 Hai	TSM WildTurtle	TSM Dyrus	TSM Santorin	
7	http://matchhistory.na.leagueoflegends.com/en/...	bKills	28.989	C9 LemonNation	TSM Bjergsen	TSM Dyrus	TSM Santorin	V
8	http://matchhistory.na.leagueoflegends.com/en/...	bKills	29.073	C9 Balls	TSM Bjergsen	TSM Dyrus	TSM Santorin	V
9	http://matchhistory.na.leagueoflegends.com/en/...	bKills	30.104	C9 Balls	TSM WildTurtle	TSM Santorin	TSM Bjergsen	TSM
10	http://matchhistory.na.leagueoflegends.com/en/...	bKills	32.801	C9 Hai	TSM Santorin	TSM Bjergsen	TSM WildTurtle	TSM
11	http://matchhistory.na.leagueoflegends.com/en/...	bKills	32.850	C9 Balls	TSM Bjergsen	TSM Santorin	TSM WildTurtle	TSM
12	http://matchhistory.na.leagueoflegends.com/en/...	bKills	33.017	C9 LemonNation	TSM Bjergsen	TSM Dyrus	TSM Santorin	V
13	http://matchhistory.na.leagueoflegends.com/en/...	bKills	38.889	C9 Meteos	TSM Bjergsen	TSM Dyrus	TSM Santorin	V
14	http://matchhistory.na.leagueoflegends.com/en/...	bKills	38.906	C9 LemonNation	TSM WildTurtle	TSM Dyrus	TSM Santorin	
15	http://matchhistory.na.leagueoflegends.com/en/...	bKills	38.964	C9 Sneaky	TSM WildTurtle	TSM Dyrus	TSM Santorin	
98342	http://matchhistory.na.leagueoflegends.com/en/...	rKills	16.529	TSM Lustboy	C9 Balls	C9 Meteos	C9 Hai	C
98343	http://matchhistory.na.leagueoflegends.com/en/...	rKills	16.791	TSM Dyrus	C9 Meteos	C9 Balls	C9 Hai	C
98344	http://matchhistory.na.leagueoflegends.com/en/...	rKills	18.784	TSM Santorin	C9 Sneaky	C9 Meteos	C9 LemonNation	

Address	Team	Time	Victim	Killer	Assist_1	Assist_2	
98345 http://matchhistory.na.leagueoflegends.com/en/...	rKills	27.073	TSM Santorin	C9 Sneaky	C9 Balls	C9 Hai	Lem
98346 http://matchhistory.na.leagueoflegends.com/en/...	rKills	29.983	TSM Santorin	C9 Hai	C9 Balls	C9 Meteos	C
98347 http://matchhistory.na.leagueoflegends.com/en/...	rKills	30.115	TSM Dyrus	C9 Sneaky	C9 Balls	C9 Meteos	
98348 http://matchhistory.na.leagueoflegends.com/en/...	rKills	32.867	TSM Dyrus	C9 Sneaky	C9 Balls	C9 Meteos	Lem
98349 http://matchhistory.na.leagueoflegends.com/en/...	rKills	32.917	TSM Santorin	C9 Sneaky	C9 Balls	C9 LemonNation	
98350 http://matchhistory.na.leagueoflegends.com/en/...	rKills	38.866	TSM Santorin	C9 Sneaky	C9 Balls	C9 Meteos	

In [209]:

```
killbytime = pd.DataFrame(columns=['bkill_5', 'rkill_5', 'bkill_10', 'rkill_10', 'bkill_
15', 'rkill_15', 'bkill_20', 'rkill_20', 'bkill_25', 'rkill_25', 'bkill_30', 'rkill_30',
'bkill_30p', 'rkill_30p'])
kcols = killbytime.columns
len(kcols)
```

Out[209]:

14

In [211]:

```
#populate kill matrix over game time
import ast
for i in range(7620):
    rowtoadd = pd.DataFrame([[0]*14], columns=kcols)
    bkillrow = loldf.iloc[i].bKills
    rkillrow = loldf.iloc[i].rKills

    bkills = ast.literal_eval(bkillrow)
    rkills = ast.literal_eval(rkillrow)

    for b in bkills:
        time = b[0]
        j = int(time//5)
        if j > 6:
            rowtoadd['bkill_30p'] = rowtoadd['bkill_30p'] + 1
        else:
            rowtoadd[kcols[j*2]] = rowtoadd[kcols[j*2]] + 1


    for r in rkills:
        time = r[0]
        j = int(time//5)
        if j > 6:
            rowtoadd['rkill_30p'] = rowtoadd['rkill_30p'] + 1
        else:
            rowtoadd[kcols[j*2+1]] = rowtoadd[kcols[j*2+1]] + 1

    #print(rowtoadd)
    killbytime=killbytime.append(rowtoadd)
```

In [215]:

```
kbt = killbytime.values
```

In [216]:

```
kbt_train = kbt[:7000]
kbt_test = kbt[7000:]
```

In [217]:

```
kbt_model = XGBClassifier()
kbt_model.fit(kbt_train, labels_train)
```

Out[217]:

```
XGBClassifier(base_score=0.5, booster='gbtree', colsample_bylevel=1,
       colsample_bytree=1, gamma=0, learning_rate=0.1, max_delta_step=0,
       max_depth=3, min_child_weight=1, missing=None, n_estimators=100,
       n_jobs=1, nthread=None, objective='binary:logistic', random_state=0,
       reg_alpha=0, reg_lambda=1, scale_pos_weight=1, seed=None,
       silent=True, subsample=1)
```

In [218]:

```
kbpred = kbt_model.predict_proba(kbt_test)
```

In [221]:

```
predictions = []
for row in kbpred:
    predictions.append(round(row[1]))
    #[round(value) for value in y_pred_team]
accuracy = accuracy_score(labels_test, predictions)
print("Accuracy: %.2f%%" % (accuracy * 100.0))
```

Accuracy: 96.61%

In [228]:

```
turret = pd.read_csv('structures.csv')
```

In [230]:

```
loldf.iloc[7001].Address
```

Out[230]:

```
'http://matchhistory.na.leagueoflegends.com/en/#match-details/TRLH3/1002160165?gameHash=6
bc48a127354bcea'
```

Turret data

In [242]:

```
firstt = turret[turret.Address == 'http://matchhistory.na.leagueoflegends.com/en/#match-
details/TRLH3/1002160165?gameHash=6bc48a127354bcea']
secondt = turret[turret.Address == 'http://matchhistory.na.leagueoflegends.com/en/#match
-details/TRLH3/1002220082?gameHash=0f88058505e4063c']

firstt = firstt.drop('Address', 1)
secondt = secondt.drop('Address', 1)
```

In [244]:

```
import json

#print(firstt.to_json)
with open('first.json', 'w') as outfile:
    json.dump(firstt.to_json(), outfile)

with open('second.json', 'w') as outfile:
    json.dump(secondt.to_json(), outfile)
```

In [254]:

```
onetur = []
secondtur = []
for i in range(len(firstt)):
    event = []
    event.append(firstt.iloc[i][0])
```

```
        event.append(firstt.iloc[i][1])
        event.append(firstt.iloc[i][2])
        event.append(firstt.iloc[i][3])
        onetur.append(event)

for i in range(len(secondt)):
    event = []
    event.append(secondt.iloc[i][0])
    event.append(secondt.iloc[i][1])
    event.append(secondt.iloc[i][2])
    event.append(secondt.iloc[i][3])
    secondtur.append(event)
```

In [266]:

```
def Sort(sub_li):
    sub_li.sort(key = lambda x: x[1])
    return sub_li
onetur = Sort(onetur)
secondtur = Sort(secondtur)
```

In [258]:

```
finalpred = (pred_team+pred1+pred2+pred3+pred4+pred5+kbpred)/7
```

In [259]:

```
finalpred
```

Out[259]:

```
array([[0.31713852, 0.68286145],
       [0.40699667, 0.59300333],
       [0.31478906, 0.685211  ],
       ...,
       [0.45218632, 0.5478137 ],
       [0.31414154, 0.6858584 ],
       [0.4547426 , 0.5452574 ]], dtype=float32)
```

In [268]:

```
secondtur
```

Out[268]:

```
[['bTowers', 10.933, 'BOT_LANE', 'OUTER_TURRET'],
 ['rTowers', 11.093, 'TOP_LANE', 'OUTER_TURRET'],
 ['bTowers', 11.472000000000001, 'BOT_LANE', 'INNER_TURRET'],
 ['bTowers', 17.194000000000003, 'TOP_LANE', 'OUTER_TURRET'],
 ['rTowers', 17.252, 'MID_LANE', 'OUTER_TURRET'],
 ['rTowers', 17.615, 'BOT_LANE', 'OUTER_TURRET'],
 ['bTowers', 17.727, 'TOP_LANE', 'INNER_TURRET'],
 ['rTowers', 17.997, 'BOT_LANE', 'INNER_TURRET'],
 ['bTowers', 24.375999999999998, 'MID_LANE', 'OUTER_TURRET'],
 ['bTowers', 28.366999999999997, 'TOP_LANE', 'BASE_TURRET'],
 ['bInhibs', 28.483, 'TOP_LANE', 'INHIBITOR'],
 ['bTowers', 28.647, 'MID_LANE', 'INNER_TURRET'],
 ['bTowers', 29.99, 'MID_LANE', 'BASE_TURRET'],
 ['bInhibs', 30.303, 'MID_LANE', 'INHIBITOR'],
 ['bTowers', 30.553, 'MID_LANE', 'NEXUS_TURRET'],
 ['bTowers', 30.619, 'MID_LANE', 'NEXUS_TURRET'],
 ['rInhibs', nan, nan, nan]]
```

In [ ]: