

In [1]:

```
import pandas as pd
G1 = pd.read_csv('FeatureG1.csv', index_col=0)
G1
```

Out[1]:

	G1: Average	G2: Average
Time window		
9:12:59 PM	-395.042105	194.305263
9:13:00 PM	-335.675439	227.412281
9:13:01 PM	-526.376344	481.397850
9:13:02 PM	-362.518519	235.055556
9:13:03 PM	-446.113043	407.000000
...	...	...
11:53:12 AM	-333.218182	379.572727
11:53:13 AM	-740.684685	888.540540
11:53:14 AM	-353.706422	115.678899
11:53:15 AM	17.389381	12.566372
11:53:16 AM	-28.747748	-55.837838

173 rows × 2 columns

In [2]:

```
from sklearn.preprocessing import MinMaxScaler
mms = MinMaxScaler()
G1_scaled = pd.DataFrame(mms.fit_transform(G1),
                          columns=G1.columns,
                          index=G1.index)
G1_scaled
```

Out[2]:

	G1: Average	G2: Average
Time window		
9:12:59 PM	0.472792	0.562307
9:13:00 PM	0.488677	0.565486
9:13:01 PM	0.437651	0.589876
9:13:02 PM	0.481494	0.566220
9:13:03 PM	0.459127	0.582732
...	...	...
11:53:12 AM	0.489334	0.580098
11:53:13 AM	0.380309	0.628974
11:53:14 AM	0.483852	0.554757
11:53:15 AM	0.583145	0.544855
11:53:16 AM	0.570800	0.538286

173 rows × 2 columns

In [3]:

```
from sklearn.cluster import KMeans
cls = KMeans(n_clusters=2, n_jobs=-1)
cls.fit(G1_scaled)
```

Out[3]:

```
KMeans(algorithm='auto', copy_x=True, init='k-means++', max_iter=300,
       n_clusters=2, n_init=10, n_jobs=-1, precompute_distances='auto',
       random_state=None, tol=0.0001, verbose=0)
```

In [4]:

```
centroid = pd.DataFrame(cls.cluster_centers_, columns=G1.columns)
```

```
import seaborn as sns
```

```
sns.heatmap(centroid)
```

```
print(centroid)
```

```
      G1: Average  G2: Average
0    0.609098    0.532730
1    0.439823    0.599438
```

In [5]:

```
x = G1
```

```
x['G1'] = cls.predict(G1_scaled)
```

```
x['G1']
```

Out[5]:

```
Time window
```

```
9:12:59 PM    1
```

```
9:13:00 PM    1
```

```
9:13:01 PM    1
```

```
9:13:02 PM    1
```

```
9:13:03 PM    1
```

```
..
```

```
11:53:12 AM    1
```

```
11:53:13 AM    1
```

```
11:53:14 AM    1
```

```
11:53:15 AM    0
```

```
11:53:16 AM    0
```

```
Name: G1, Length: 173, dtype: int32
```

In [6]:

```
G2 = pd.read_csv('FeatureG2.csv', index_col=0)  
G2
```

Out[6]:

	G1: Average	G2: Average
Time window		
11:53:17 AM	-35.600000	128.155556
11:54:59 AM	-161.647059	-90.470588
11:55:00 AM	145.657895	124.307018
11:55:01 AM	26.723214	29.741071
11:55:02 AM	708.781250	556.250000
11:55:03 AM	1056.911770	-93.676471
11:55:04 AM	228.138889	-171.120370
11:55:05 AM	-411.945946	297.585586
11:55:06 AM	91.642202	29.889908
11:55:07 AM	44.964602	-0.690265
11:55:08 AM	-61.027027	-227.927928
11:55:09 AM	191.394231	302.682692
9:14:22 PM	-480.626000	-9.043480
9:14:23 PM	-429.921000	317.649100
9:14:24 PM	-364.754000	423.552600
9:14:25 PM	-448.746000	235.833300
9:14:26 PM	-394.193000	220.403500
9:14:27 PM	-380.052000	247.391300
9:14:28 PM	-398.860000	264.337200
9:14:29 PM	-282.243000	464.113000
9:14:30 PM	-392.796000	400.840700
9:14:31 PM	-371.070000	351.587700
9:14:32 PM	-383.374000	253.321700
9:14:33 PM	-393.235000	242.208700
9:14:34 PM	-354.670000	269.930400
9:14:35 PM	-435.711000	269.350900
9:14:36 PM	-347.643000	288.417400
9:14:37 PM	-382.202000	567.780700
9:14:38 PM	-293.026000	99.000000
9:14:39 PM	-368.526000	93.552630
9:14:40 PM	-411.235000	310.747800
9:14:41 PM	-353.920000	107.919500
9:14:42 PM	-433.983000	352.721700
9:14:43 PM	-598.289000	76.754390
9:14:44 PM	-482.605000	-217.974000
9:14:45 PM	-197.000000	537.201800

G1: Average    G2: Average

Time window

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9:14:46 PM	-484.000000	377.904800
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In [7]:

```
from sklearn.preprocessing import MinMaxScaler
mms = MinMaxScaler()
G2_scaled = pd.DataFrame(mms.fit_transform(G2),
                          columns=G2.columns,
                          index=G2.index)
G2_scaled
```

Out[7]:

	G1: Average	G2: Average
Time window		
11:53:17 AM	0.339952	0.447505
11:54:59 AM	0.263800	0.172748
11:55:00 AM	0.449460	0.442668
11:55:01 AM	0.377605	0.323823
11:55:02 AM	0.789675	0.985509
11:55:03 AM	1.000000	0.168719
11:55:04 AM	0.499292	0.071392
11:55:05 AM	0.112580	0.660435
11:55:06 AM	0.416826	0.324010
11:55:07 AM	0.388626	0.285579
11:55:08 AM	0.324590	0.000000
11:55:09 AM	0.477092	0.666840
9:14:22 PM	0.071087	0.275081
9:14:23 PM	0.101721	0.685649
9:14:24 PM	0.141092	0.818743
9:14:25 PM	0.090347	0.582828
9:14:26 PM	0.123306	0.563437
9:14:27 PM	0.131849	0.597353
9:14:28 PM	0.120486	0.618650
9:14:29 PM	0.190941	0.869717
9:14:30 PM	0.124150	0.790200
9:14:31 PM	0.137276	0.728301
9:14:32 PM	0.129842	0.604806
9:14:33 PM	0.123885	0.590840
9:14:34 PM	0.147184	0.625679
9:14:35 PM	0.098223	0.624951
9:14:36 PM	0.151429	0.648913
9:14:37 PM	0.130550	1.000000
9:14:38 PM	0.184427	0.410864
9:14:39 PM	0.138813	0.404018
9:14:40 PM	0.113010	0.676976
9:14:41 PM	0.147637	0.422073
9:14:42 PM	0.099267	0.729726
9:14:43 PM	0.000000	0.382907
9:14:44 PM	0.069891	0.012510
9:14:45 PM	0.242441	0.961570



G1: Average   G2: Average

Time window

9:14:46 PM	0.069048	0.761375
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In [8]:

```
x = G2
x['G2'] = cls.predict(G2_scaled)
x['G2']
```

Out[8]:

```
Time window
11:53:17 AM    1
11:54:59 AM    1
11:55:00 AM    1
11:55:01 AM    1
11:55:02 AM    0
11:55:03 AM    0
11:55:04 AM    0
11:55:05 AM    1
11:55:06 AM    1
11:55:07 AM    1
11:55:08 AM    0
11:55:09 AM    1
9:14:22 PM     1
9:14:23 PM     1
9:14:24 PM     1
9:14:25 PM     1
9:14:26 PM     1
9:14:27 PM     1
9:14:28 PM     1
9:14:29 PM     1
9:14:30 PM     1
9:14:31 PM     1
9:14:32 PM     1
9:14:33 PM     1
9:14:34 PM     1
9:14:35 PM     1
9:14:36 PM     1
9:14:37 PM     1
9:14:38 PM     1
9:14:39 PM     1
9:14:40 PM     1
9:14:41 PM     1
9:14:42 PM     1
9:14:43 PM     1
9:14:44 PM     1
9:14:45 PM     1
9:14:46 PM     1
Name: G2, dtype: int32
```

In [ ]: