In [12]:

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

Out[12]:

Time window	A1: Average	A2: Average	A3: Average
9:12:59 PM	-14617.00000	-1777.273684	-5420.210526
9:13:00 PM	-14628.78947	-1713.868421	-5320.885965
9:13:01 PM	-14614.88172	-1815.645161	-5335.784946
9:13:02 PM	-14690.69444	-1766.212963	-5186.685185
9:13:03 PM	-14683.90435	-1785.756522	-5144.652174
...	...	...	...
11:53:12 AM	-11742.78182	-6676.927273	-7327.318182
11:53:13 AM	-12588.88288	-5779.234234	-6577.495495
11:53:14 AM	-13582.19266	-4554.834862	-5736.201835
11:53:15 AM	-13989.17699	-3828.522124	-5215.345133
11:53:16 AM	-14279.85586	-3511.441441	-5124.090090

173 rows × 3 columns

In [13]:

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

Out[13]:

Time window	A1: Average	A2: Average	A3: Average
9:12:59 PM	0.029524	0.534957	0.530204
9:13:00 PM	0.029093	0.537801	0.536942
9:13:01 PM	0.029601	0.533236	0.535932
9:13:02 PM	0.026832	0.535454	0.546047
9:13:03 PM	0.027080	0.534577	0.548899
...	...	...	...
11:53:12 AM	0.134511	0.315194	0.400815
11:53:13 AM	0.103605	0.355458	0.451687
11:53:14 AM	0.067322	0.410376	0.508765
11:53:15 AM	0.052456	0.442953	0.544103
11:53:16 AM	0.041839	0.457175	0.550294

173 rows × 3 columns

In [14]:

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

Out[14]:

```
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)
```

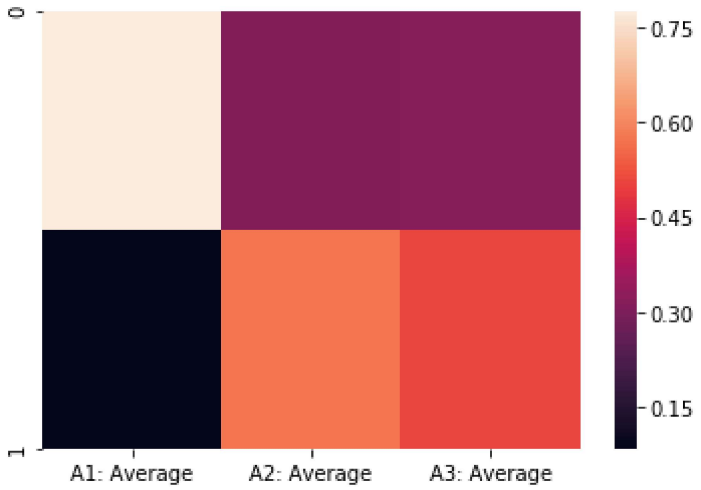
In [15]:

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

import seaborn as sns
sns.heatmap(centroid)

print(centroid)
```

```
   A1: Average  A2: Average  A3: Average
0     0.774982     0.312877     0.320724
1     0.083814     0.575283     0.508707
```



In [16]:

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

Out[16]:

```
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    1
11:53:16 AM    1
Name: G1, Length: 173, dtype: int32
```

In [17]:

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

Out[17]:

Time window	A1: Average	A2: Average	Unnamed: 3
11:54:59 AM	-15280.2549	-1116.411770	-3694.39216
11:55:00 AM	-15122.0614	-865.894737	-3759.42983
11:55:01 AM	-15094.3036	-1022.535710	-3853.02679
11:55:02 AM	-14475.1250	-1988.437500	-4028.81250
11:55:03 AM	-11769.2941	-5657.205880	-8273.97059
11:55:04 AM	-10237.1944	-6741.685190	-9026.84259
11:55:05 AM	-10725.1441	-5945.864870	-8903.17117
11:55:06 AM	-11192.3486	-5776.431190	-8518.57798
11:55:07 AM	-11233.5841	-5557.973450	-8567.69027
11:55:08 AM	-11242.1532	-5870.360360	-8393.69369
11:55:09 AM	-11324.1058	-5770.192310	-8369.82692
9:14:22 PM	-12847.3000	6740.643000	-5740.45000
9:14:23 PM	-12942.4000	6646.781000	-5597.13000
9:14:24 PM	-12982.0000	6819.044000	-5402.47000
9:14:25 PM	-13031.2000	6802.588000	-5274.74000
9:14:26 PM	-13082.4000	6827.333000	-5231.25000
9:14:27 PM	-13094.4000	6763.209000	-5226.63000
9:14:28 PM	-13123.9000	6671.244000	-5278.16000
9:14:29 PM	-13127.8000	6731.191000	-5234.35000
9:14:30 PM	-13156.1000	6672.690000	-5142.27000
9:14:31 PM	-13232.3000	6796.412000	-4938.13000
9:14:32 PM	-13254.0000	6718.383000	-4928.38000
9:14:33 PM	-13270.0000	6706.878000	-4919.04000
9:14:34 PM	-13310.8000	6677.330000	-4930.57000
9:14:35 PM	-13315.1000	6619.904000	-4867.54000
9:14:36 PM	-13322.0000	6653.809000	-4847.06000
9:14:37 PM	-13337.4000	6842.851000	-4607.97000
9:14:38 PM	-13165.9000	7146.965000	-4704.96000
9:14:39 PM	-13218.3000	6837.728000	-5149.77000
9:14:40 PM	-13211.6000	6776.078000	-4998.32000
9:14:41 PM	-13260.9000	6649.046000	-5047.76000
9:14:42 PM	-13267.1000	6554.435000	-5158.43000
9:14:43 PM	-13361.0000	6633.026000	-4764.99000
9:14:44 PM	-13078.2000	7050.579000	-4939.39000
9:14:45 PM	-13084.6000	6832.096000	-5190.36000
9:14:46 PM	-13196.4000	6489.667000	-5194.95000

In [18]:

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

Out[18]:

Time window	A1: Average	A2: Average	Unnamed: 3
11:54:59 AM	0.000000	0.405027	1.000000
11:55:00 AM	0.031369	0.423064	0.987803
11:55:01 AM	0.036873	0.411786	0.970251
11:55:02 AM	0.159651	0.342240	0.937286
11:55:03 AM	0.696196	0.078084	0.141187
11:55:04 AM	1.000000	0.000000	0.000000
11:55:05 AM	0.903243	0.057300	0.023192
11:55:06 AM	0.810600	0.069499	0.095315
11:55:07 AM	0.802424	0.085229	0.086105
11:55:08 AM	0.800724	0.062736	0.118735
11:55:09 AM	0.784474	0.069949	0.123211
9:14:22 PM	0.482436	0.970744	0.616301
9:14:23 PM	0.463579	0.963986	0.643178
9:14:24 PM	0.455726	0.976389	0.679682
9:14:25 PM	0.445970	0.975204	0.703636
9:14:26 PM	0.435818	0.976986	0.711791
9:14:27 PM	0.433438	0.972369	0.712658
9:14:28 PM	0.427589	0.965747	0.702994
9:14:29 PM	0.426815	0.970064	0.711210
9:14:30 PM	0.421204	0.965852	0.728478
9:14:31 PM	0.406094	0.974760	0.766761
9:14:32 PM	0.401791	0.969142	0.768589
9:14:33 PM	0.398618	0.968313	0.770341
9:14:34 PM	0.390528	0.966186	0.768178
9:14:35 PM	0.389675	0.962051	0.779998
9:14:36 PM	0.388307	0.964492	0.783839
9:14:37 PM	0.385253	0.978103	0.828676
9:14:38 PM	0.419260	1.000000	0.810487
9:14:39 PM	0.408870	0.977735	0.727071
9:14:40 PM	0.410198	0.973296	0.755473
9:14:41 PM	0.400423	0.964149	0.746202
9:14:42 PM	0.399193	0.957337	0.725447
9:14:43 PM	0.380573	0.962996	0.799230
9:14:44 PM	0.436651	0.993060	0.766524
9:14:45 PM	0.435381	0.977329	0.719460
9:14:46 PM	0.413212	0.952674	0.718599

In [11]:

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

Out[11]:

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

In [ ]:

```

```