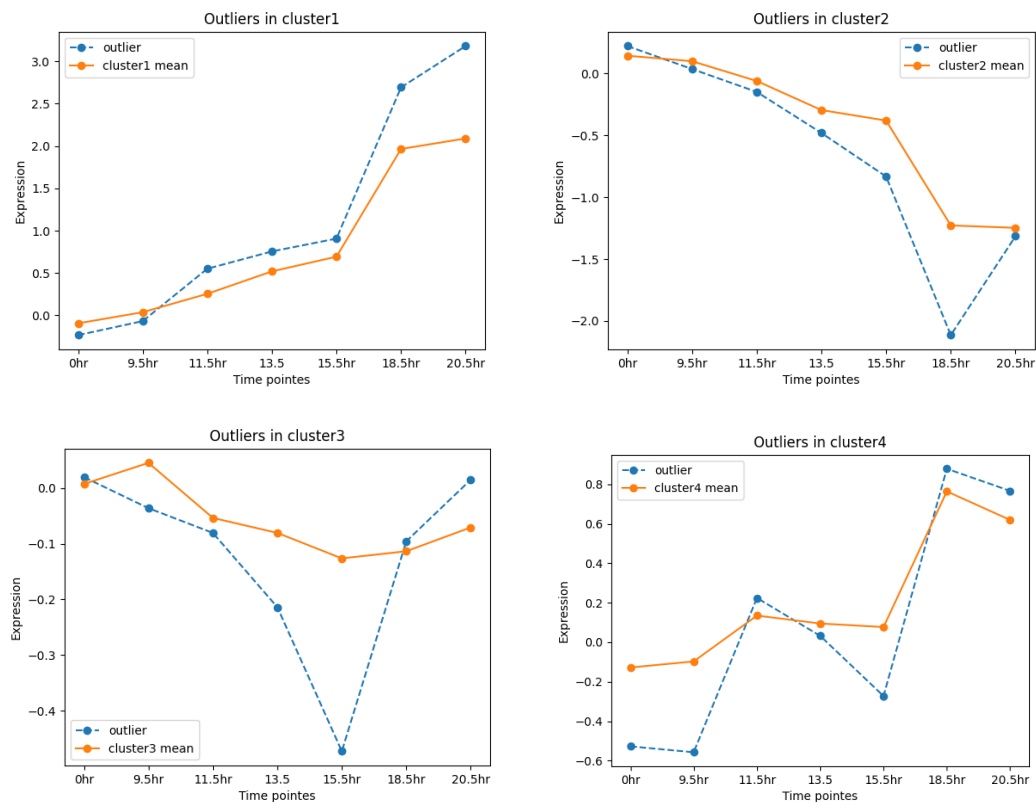


Supplement: K=4 outliers in each cluster



Supplement: Complete workflow of code for K=3

```
[Running] python3 "/Users/junweisun/Documents/CS CM121/clustering_project.py"
The initial centers are [[-0.229, 0.211, -0.278, -0.134, -0.243, -0.328, 0.23], [0.035, 0.157, -0.091, 0.596, 0.465, 1.562, 1.499], [0.153, -0.222, 0.026, 0.08, -0.195, -1.553, -1.909]]
The number of iterations is 43.
The final centers are [[-0.05994663278271924, -0.02113926302414438, 0.02253240152477665, -0.01112401524778729, -0.05712274459974875, 0.280872935196943, 0.23709529860227974], [-0.10999324975874855, -0.03369141755017311, 0.23073577627762623, 0.3652005785918831, 0.4722478302792064, 1.5141456123428723, 1.5049189971065065], [0.10226605504591832, 0.08390896259708355, -0.06714255469302258, -0.23260409315455413, -0.2923839096682616, -0.8935885673962298, -0.8842928722656248]]
There are 3936 data points in cluster1.
There are 1038 data points in cluster2.
There are 1418 data points in cluster3.
The final cluster centers by BIRCH are [[-0.02441822691833936, 0.00015396496305486828, 0.017228672585633983, -0.04333625932221218, -0.0830662847975078, 0.06195786046438016, 0.023688870249757615], [-0.10624415305163151, 0.01498080535448802, 0.24344835866477132, 0.46968976764558684, 0.6315641792285085, 1.8736196510095922, 1.974673104124069], [-0.88725, -2.10875, -0.7695, -0.8655, -4.166, 1.302, 0.84075]]
[Done] exited with code=0 in 9.598 seconds
```