

Hand picking similar behaving group of customers to check  
clustering results

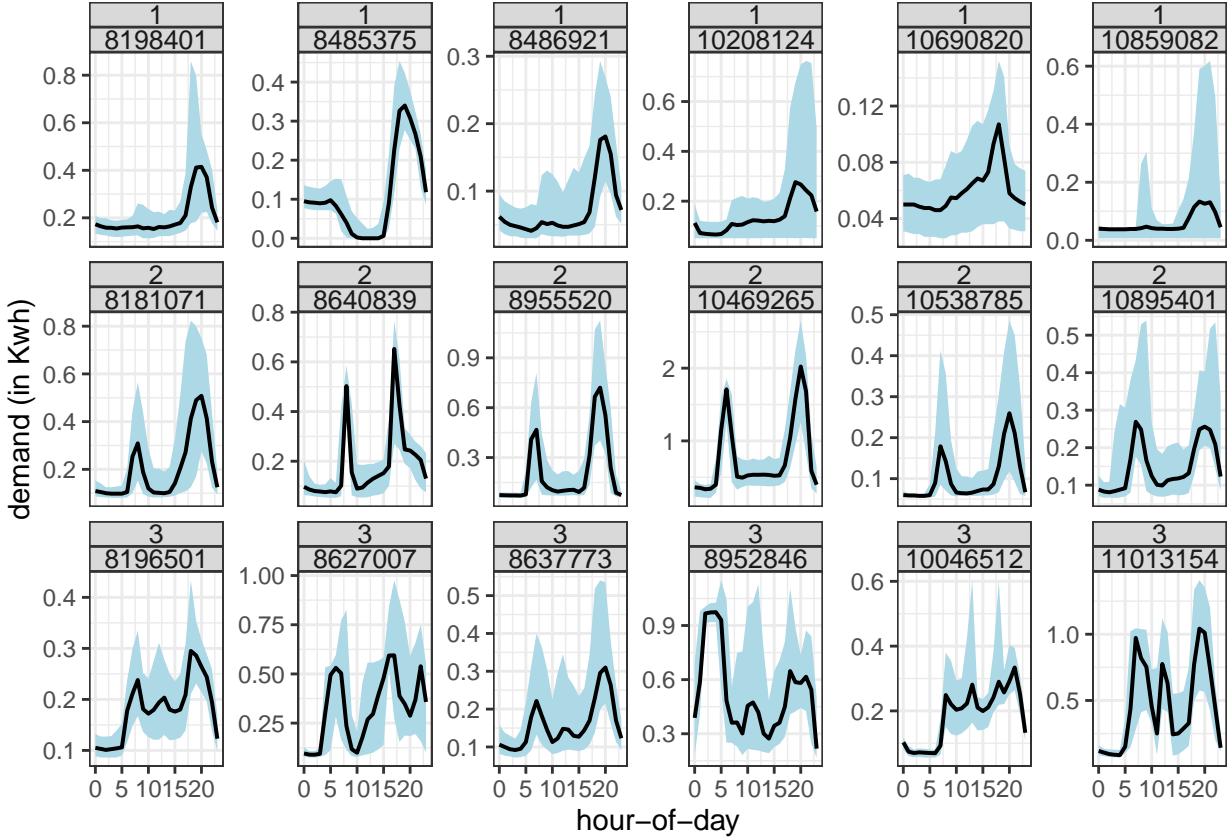


Figure 1: Median (black) and quartile deviation (blue region) of hourly demand drawn for few customers showing similar behaviors. Roughly speaking, Design 1 has one evening peak, Design 2 has two peaks and Design 3 has three peaks in a day. Each of design 1, 2 and 3 have six similar behaving customers resulting to 18 time series. We want our clustering results to group each of the designs together.

```
##           Reference
## Prediction 1 2 3
##           1 5 2 1
##           2 1 3 1
##           3 0 1 4
```

Table 1: Actual and predicted allocation of designs to customers

customer_id	design	pred_design	hour_day	day_month
10859082	1	1	17.1	4.5
10690820	1	1	16.4	4.9

customer_id	design	pred_design	hour_day	day_month
8486921	1	1	10.1	5.7
10208124	1	1	16.5	9.7
8198401	1	1	5.8	10.1
8637773	3	1	0.5	10.6
10538785	2	1	13.8	13.4
8181071	2	1	24.3	14.3
8196501	3	2	10.9	25.4
10895401	2	2	8.1	27.0
8955520	2	2	8.7	30.6
8485375	1	2	5.9	31.5
8640839	2	2	3.2	36.5
8627007	3	3	6.1	45.1
10469265	2	3	4.5	47.7
11013154	3	3	12.4	48.0
10046512	3	3	6.4	49.0
8952846	3	3	0.0	52.7

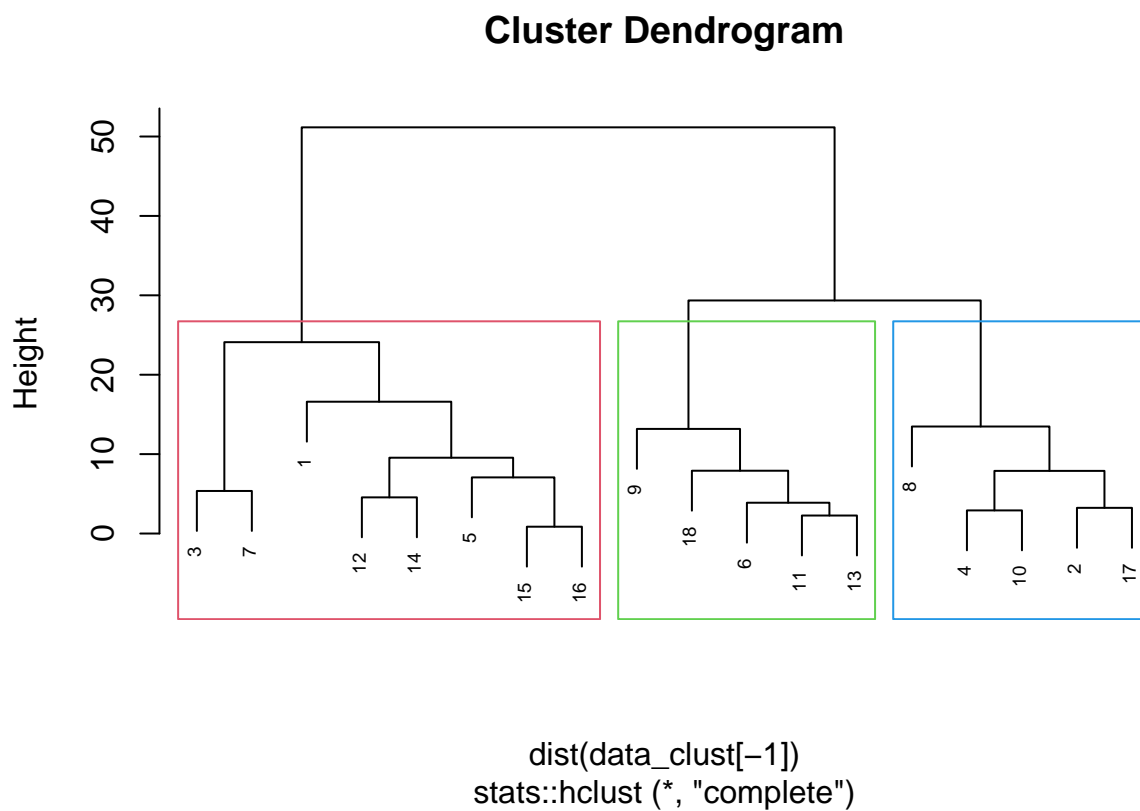


Figure 2: Dendrogram from clustering 18 time series into three clusters.

##—cluster-characterization

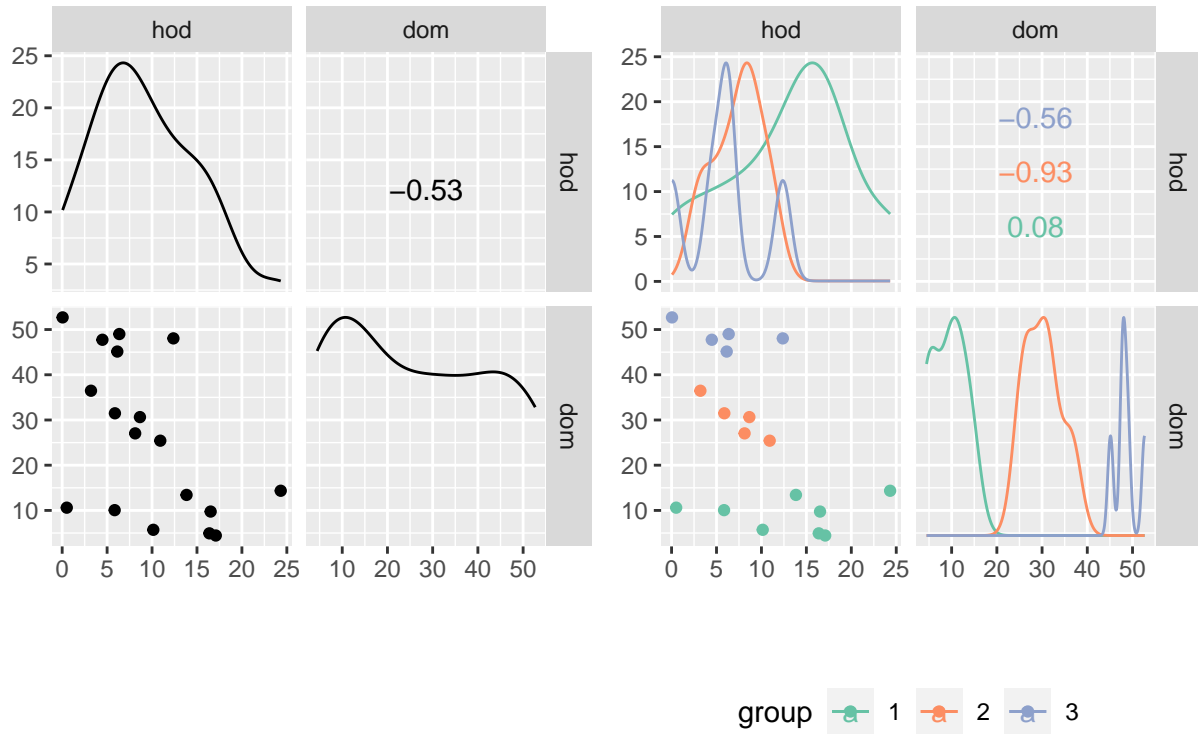
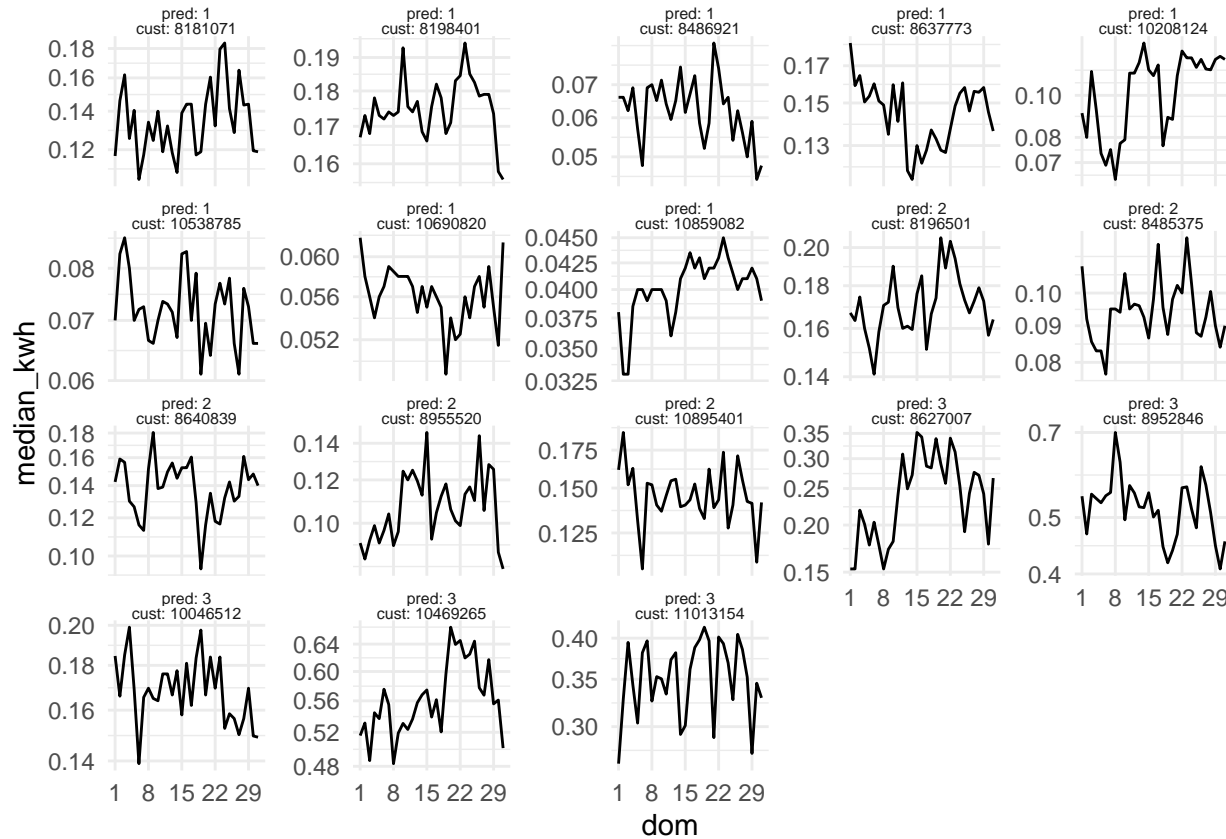


Figure 3: Pairs plot show that `dom` is the variable that is responsible for this clustering. The green colored cluster correspond to lowest value of `dom`, the orange colored and blue colored one correspond to middle range and high range of `dom`.



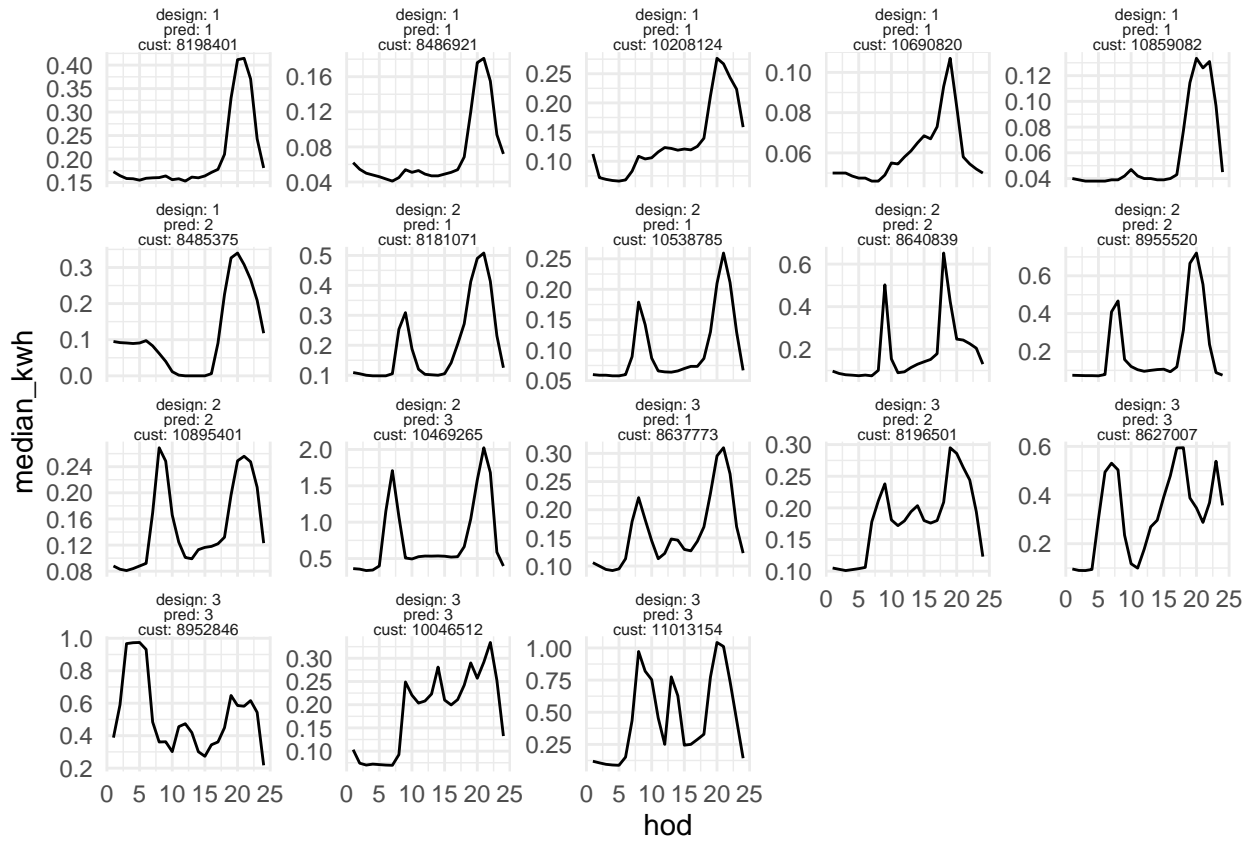
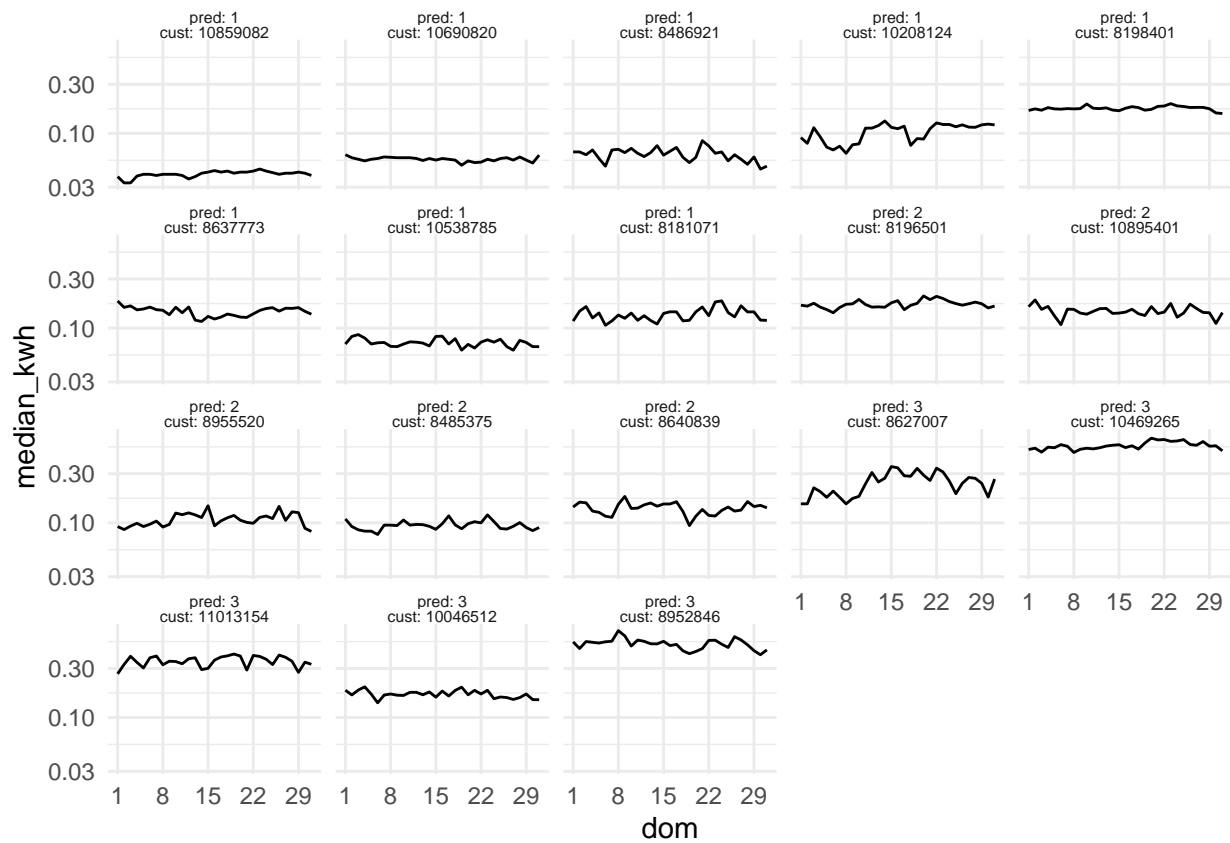
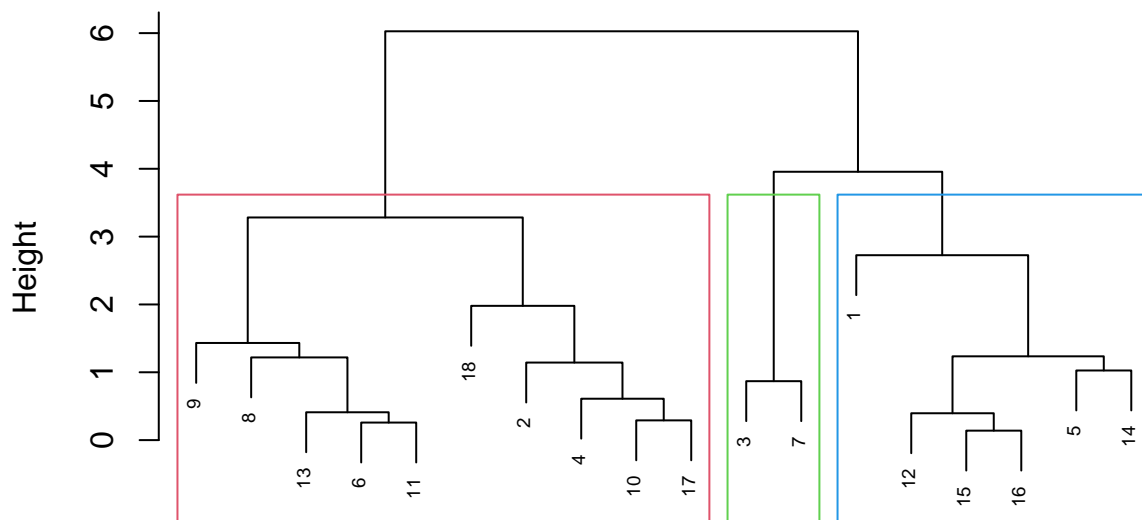


Figure 4: First facet label indicate actual design, second denote predicted design, third denote customer\_id.



**Cluster Dendrogram**



```
dist(data_clust[-1], method = "manhattan")
stats::hclust(*, "complete")
```

customer_id	design	pred_design_scale		pred_design	hour_day	day_month	hod_scaled	dom_scaled
8198401	1	3	1		5.8	10.1	-0.6	-0.9
8485375	1	2	2		5.9	31.5	-0.6	0.3
8486921	1	1	1		10.1	5.7	0.1	-1.2
10208124	1	1	1		16.5	9.7	1.1	-0.9
10690820	1	1	1		16.4	4.9	1.1	-1.2
10859082	1	1	1		17.1	4.5	1.2	-1.2
8181071	2	1	1		24.3	14.3	2.3	-0.7
8640839	2	2	2		3.2	36.5	-1.0	0.6
8955520	2	2	2		8.7	30.6	-0.1	0.3
10469265	2	2	3		4.5	47.7	-0.8	1.3
10538785	2	1	1		13.8	13.4	0.7	-0.7
10895401	2	2	2		8.1	27.0	-0.2	0.1
8196501	3	2	2		10.9	25.4	0.2	0.0
8627007	3	2	3		6.1	45.1	-0.5	1.1
8637773	3	3	1		0.5	10.6	-1.4	-0.9
8952846	3	2	3		0.0	52.7	-1.5	1.5
10046512	3	2	3		6.4	49.0	-0.5	1.3
11013154	3	2	3		12.4	48.0	0.5	1.3

