Simulation with algorithm 2

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Simulation design

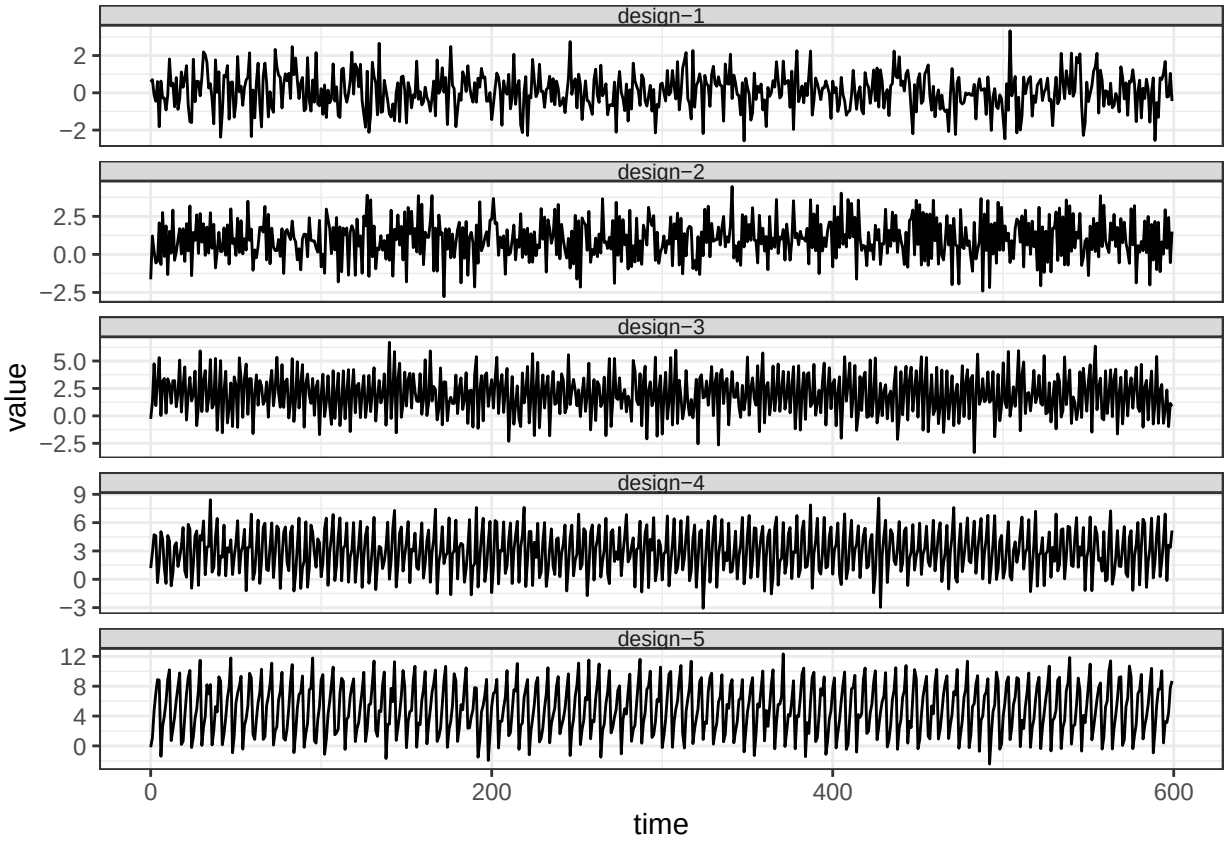
Three circular granularities g1, g2 and g3 are considered with levels 2, 3 and 4 respectively. Many time series with 600 observations are created using the five designs below, each of which is iterated four times. We anticipate to have five clusters, each with four time series conforming to the same design, once we execute the clustering.

Algorithm

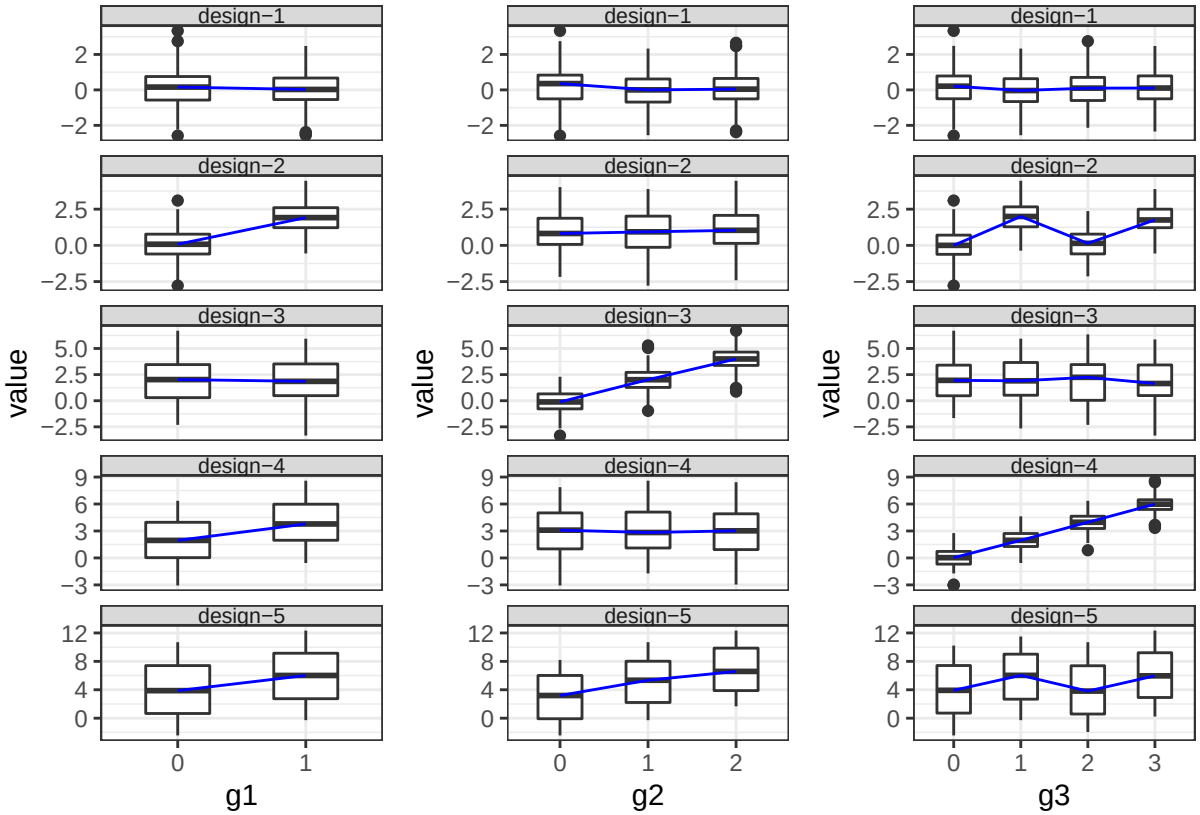
Compute wpd for each granularity.The distance matrix is then computed with 20 time series as cases and three granularities as variables. Manhattan distances are computed and then hierarchical clustering is applied on them.

design	g1	g2	g3
design-1	no	no	no
design-2	yes	no	yes
design-3	no	yes	no
design-4	yes	no	yes
design-5	yes	yes	yes

Raw plots


design−1
design−2
design−3
design−4
design−5
value
time
0
200
400
600

Designs (Distribution of simulated data across different granularities)




```
## # A tibble: 5 x 2
##   group     n
##   <int> <int>
## 1     1     4
## 2     2     4
## 3     3     4
## 4     4     4
## 5     5     4
```

```
## # A tibble: 4 x 2
##   group customer_id
##   <int> <chr>
## 1     1 design-1-s-1
## 2     1 design-1-s-2
## 3     1 design-1-s-3
## 4     1 design-1-s-4
```

```
## # A tibble: 4 x 2
##   group customer_id
##   <int> <chr>
## 1     2 design-2-s-1
## 2     2 design-2-s-2
## 3     2 design-2-s-3
## 4     2 design-2-s-4
```

```
## # A tibble: 4 x 2
```

```
##   group customer_id
##   <int> <chr>
## 1     3 design-3-s-1
## 2     3 design-3-s-2
## 3     3 design-3-s-3
## 4     3 design-3-s-4
```

```
## # A tibble: 4 x 2
##   group customer_id
##   <int> <chr>
## 1     4 design-4-s-1
## 2     4 design-4-s-2
## 3     4 design-4-s-3
## 4     4 design-4-s-4
```

```
## # A tibble: 4 x 2
##   group customer_id
##   <int> <chr>
## 1     5 design-5-s-1
## 2     5 design-5-s-2
## 3     5 design-5-s-3
## 4     5 design-5-s-4
```