

FinalAll

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2018 年 6 月 21 日

0. 使用 GAM 分析 EnerNOC Dataset 中商用大樓的用電狀況

1. Dataset 介紹:

名稱: EnerNOC GreenButton Data

來源: open enernoc data

https://github.com/PetoLau/petolau.github.io/tree/master/_rmd/ 簡述: 原始資料集由 EnerNOC 電力公司提供, 它依循時間序列記錄了 2012 年 100 棟不記名的建築物每 5 分鐘的用電情況。經過整理後的資料記載了每半個小時的用電狀況, 其解釋變數如下

- value: 特定時間點下的電耗值
- week: 週次 - date: 日期
- type: 大樓類型

2. 使用的方法:

Generalized additive model (GAM)

3. 大綱

1. 資料集分析
2. 模型選擇
3. 分析解釋變量的重要情況
4. 預測電耗

1. 資料集分析

引入必要的模組

```
library(feather)
library(data.table)
library(mgcv)
```

```
## Loading required package: nlme
```

```
## This is mgcv 1.8-23. For overview type 'help("mgcv-package")'.
```

```
library(car)
```

```
## Loading required package: carData
```

```
library(ggplot2)
```

讀取資料

```
DT <- as.data.table(read_feather("D:/WORKSPACE/RProjects/EnorNOC-GAM/DT_4_ind"))
```

```
str(DT)
```

```
## Classes 'data.table' and 'data.frame': 70080 obs. of 5 variables:
```

```
## $ date_time: POSIXct, format: "2012-01-02 00:00:00" "2012-01-02 00:30:00" ...
```

```
## $ value : num 1590 1564 1560 1585 1604 ...
```

```
## $ week : chr "Monday" "Monday" "Monday" "Monday" ...
```

```
## $ date : Date, format: "2012-01-02" "2012-01-02" ...
```

```
## $ type : chr "Commercial Property" "Commercial Property" "Commercial Property" "Commercial Property" ...
```

```
## - attr(*, ".internal.selfref")=<externalptr>
```

畫圖查看資料

```
ggplot(data = DT, aes(x = date, y = value)) +  
  geom_line() +  
  facet_grid(type ~ ., scales = "free_y") +  
  theme(panel.border = element_blank(),  
        panel.background = element_blank(),  
        panel.grid.minor = element_line(colour = "grey90"),  
        panel.grid.major = element_line(colour = "grey90"),  
        panel.grid.major.x = element_line(colour = "grey90"),  
        axis.text = element_text(size = 10),  
        axis.title = element_text(size = 12, face = "bold"),  
        strip.text = element_text(size = 9, face = "bold")) +  
  labs(x = "Date", y = "Load (kW)")
```

```

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## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

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## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <88>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <b8>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <80>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <9c>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <8d>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <81>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <b8>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <80>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <88>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <b8>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <80>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <81>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <83>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <81>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <81>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <80>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <81>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <81>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2013' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2013' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2013' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2013' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2013' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2013' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2012' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  2012' in 'mbcsToSbcs': dot substituted for <e5>

```



```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <81>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbcsToSbcs': dot substituted for <9c>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <81>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbsToSbs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbsToSbs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbsToSbs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbsToSbs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbsToSbs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbsToSbs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2013' in 'mbsToSbs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 銖 2012' in 'mbsToSbs': dot substituted for <80>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <83>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <8d>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <81>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <80>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <e4>

```

```

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <b8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <80>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <e5>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <9b>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <9b>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <9b>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <9c>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <83>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2012' in 'mbcsToSbcs': dot substituted
## for <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <e5>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <8d>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <81>
```



```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 2012' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted
## for <e4>
```

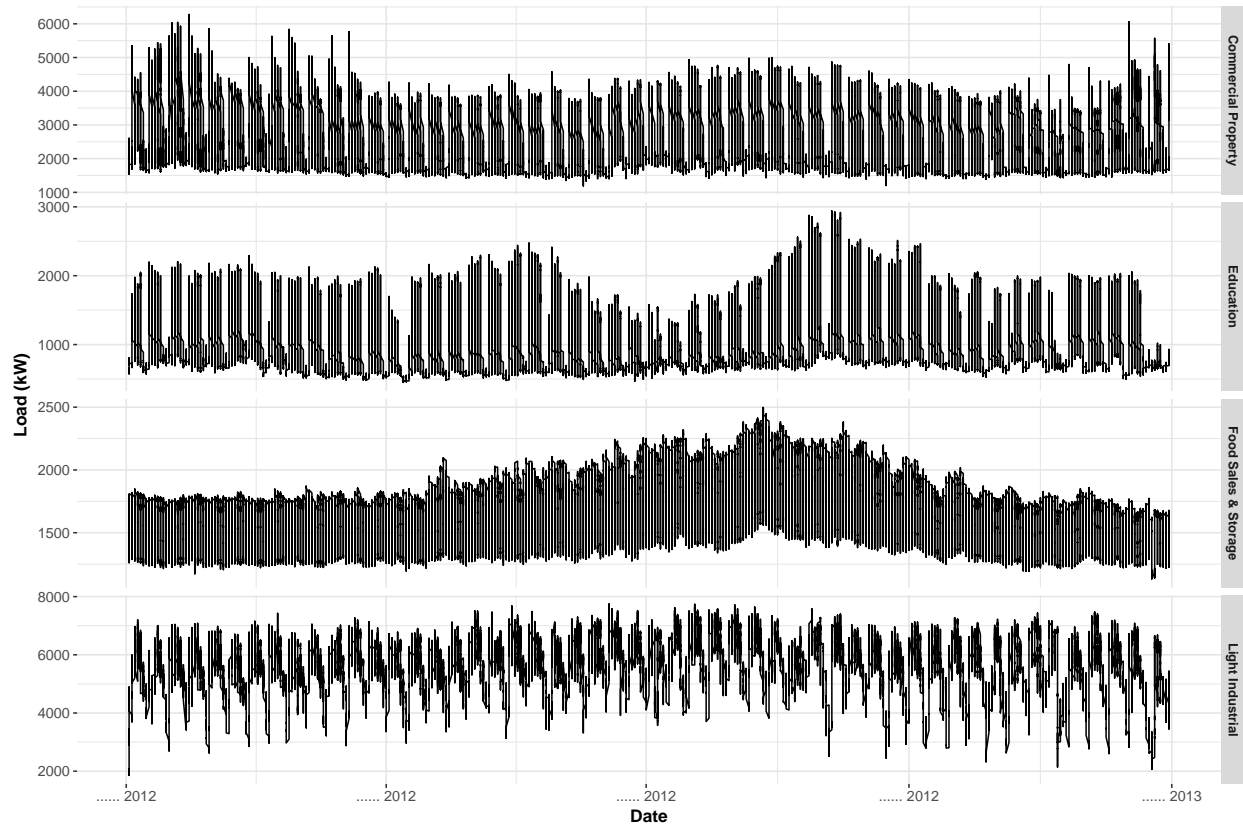
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted
## for <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted
## for <80>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted
## for <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted
## for <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 2013' in 'mbcsToSbcs': dot substituted
## for <88>
```



可以看出 Food Sales & Storage 這一類的用電情況不隨工作日/雙休日而變化

為了方便描述電耗與週次的關係，這裡使用 package car 中的 function recode，新增一個欄位，記載週次所對應的數字

```
DT[, week_num := as.integer(car::recode(week,
  "'Monday'='1';'Tuesday'='2';'Wednesday'='3';'Thursday'='4';
  'Friday'='5';'Saturday'='6';'Sunday'='7'"))]
unique(DT[, week])
```

```
## [1] "Monday"    "Tuesday"    "Wednesday"  "Thursday"   "Friday"     "Saturday"
## [7] "Sunday"
```

```
unique(DT[, week_num])
```

```
## [1] 1 2 3 4 5 6 7
```

從讀取的資料中獲取 industry, date, weekday and period 等信息，並使用變量來儲存。因為每半個小時觀察一次，所以一天的資料由 48 筆連續的觀察資料組成，因此有 `period <- 48`

```
n_type <- unique(DT[, type])
n_date <- unique(DT[, date])
n_weekdays <- unique(DT[, week])
period <- 48
```

截取兩個禮拜內的商業用樓房的電耗記錄，並儲存在 `data_r` 變量中。之後畫圖展示之。

`type == n_type[1]` 表示 “Commercial Property”，`date %in% n_date[57:70]` 表示兩個禮拜

```
data_r <- DT[(type == n_type[1] & date %in% n_date[57:70])]

ggplot(data_r, aes(date_time, value)) +
  geom_line() +
  theme(panel.border = element_blank(),
        panel.background = element_blank(),
        panel.grid.minor = element_line(colour = "grey90"),
        panel.grid.major = element_line(colour = "grey90"),
        panel.grid.major.x = element_line(colour = "grey90"),
        axis.text = element_text(size = 10),
        axis.title = element_text(size = 12, face = "bold")) +
  labs(x = "Date", y = "Load (kW)")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

```

[illegible]

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

```

```

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```

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

```



```

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <ba>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <8c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <88>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>
```

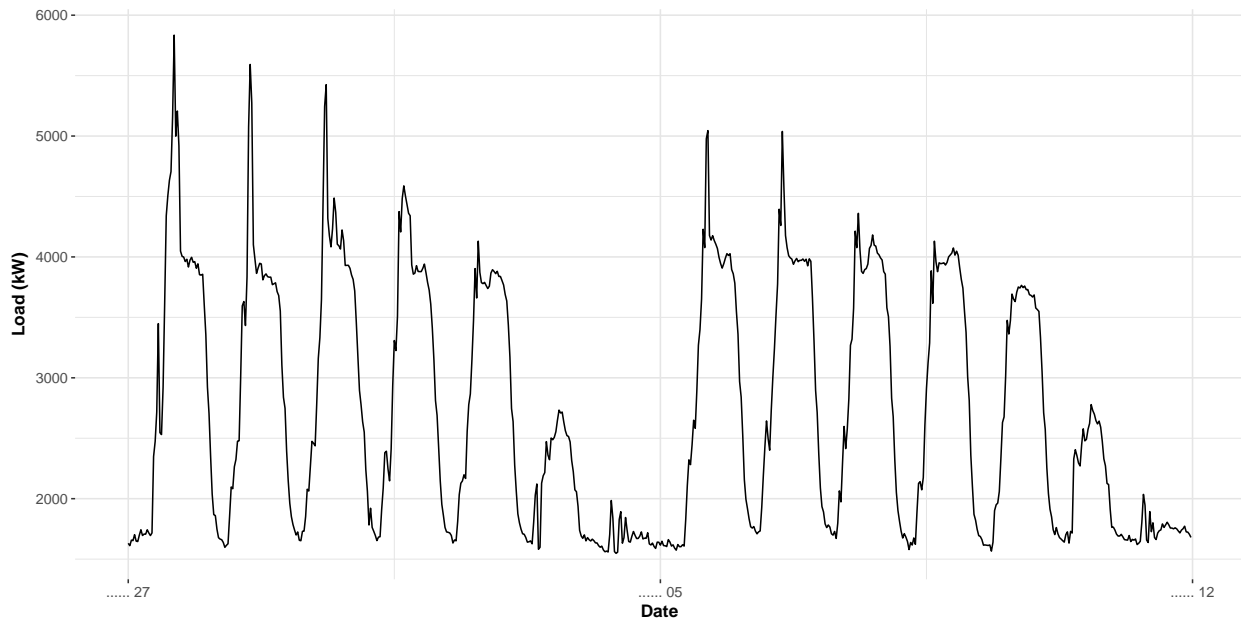
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```



根據每天的週期性變化和每週的週期性變化，重新構建資料

```
N <- nrow(data_r) # train set 中的資料筆數
window <- N / period # train set 所囊括的天數
matrix_gam <- data.table(Load = data_r[, value],
                          Daily = rep(1:period, window),
                          Weekly = data_r[, week_num])
head(matrix_gam)
```

```
##      Load Daily Weekly
## 1: 1630.875     1      1
## 2: 1611.201     2      1
## 3: 1657.160     3      1
## 4: 1653.042     4      1
```

```
## 5: 1702.316      5      1
## 6: 1648.411      6      1
```

2. 模型選擇

使用 `mgcv` 套件包的 `gam` 函數建立 GAM 模型，其中每天的週期性變化採用 `cubic regression spline` 模式來描述，每週的週期性變化採用 `P-splines` 來描述。

```
gam_1 <- gam(Load ~ s(Daily, bs = "cr", k = period) +
             s(Weekly, bs = "ps", k = 7),
             data = matrix_gam,
             family = gaussian)
```

查看模型的 `summary`

```
summary(gam_1)$r.sq
```

```
## [1] 0.7718406
```

```
summary(gam_1)$sp.criterion
```

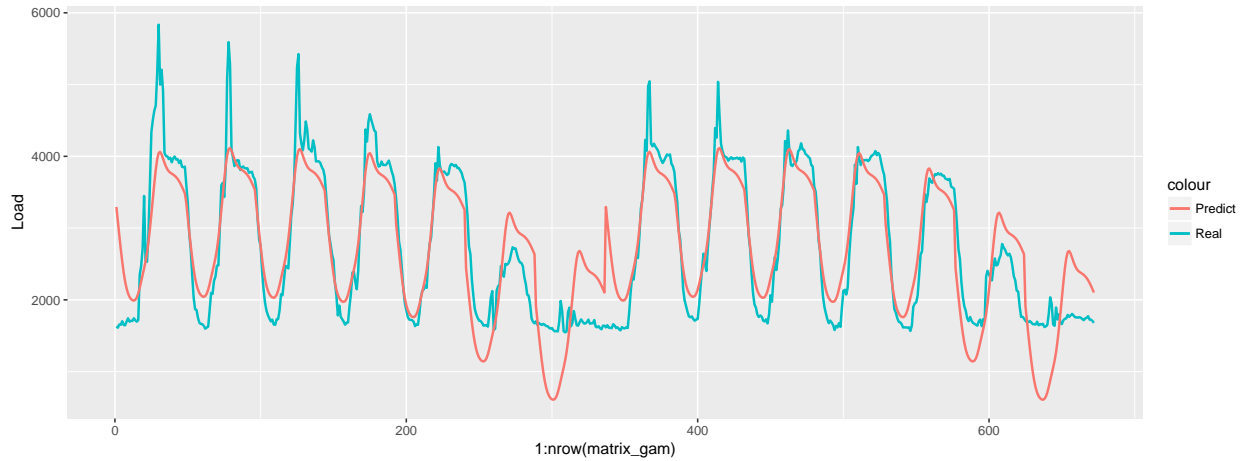
```
## GCV.Cp
```

```
## 245544.9
```

GCV 是表示擬合情況的一個指標，越小說明模型的擬合效果越好。另外可以看出，R-sq 的數值不高，這個模型效果不好

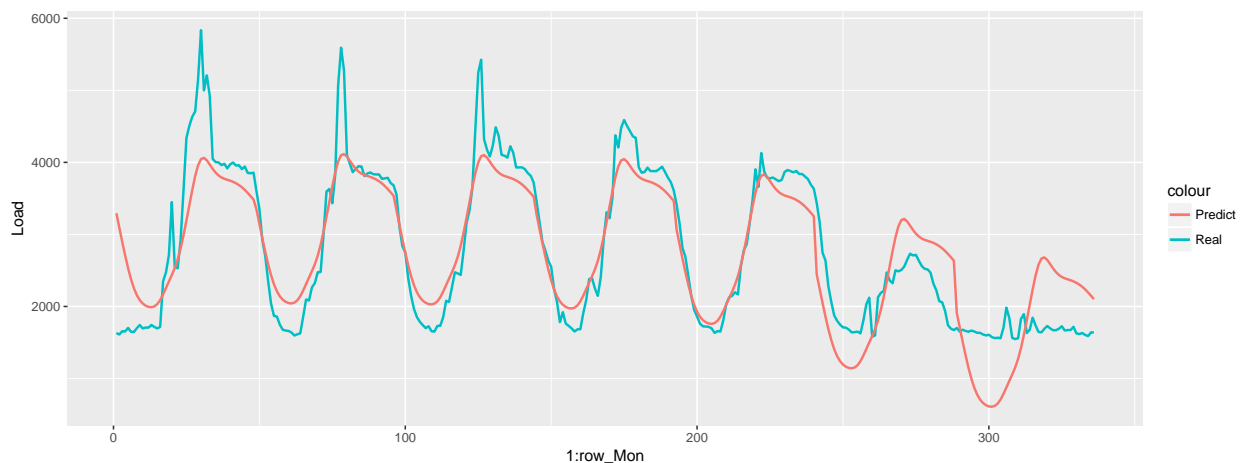
查看這兩個禮拜的用電量的情況實際值與預測值的比較。

```
matrix_gam$Predict=gam_1$fitted.values
ggplot(matrix_gam[1:nrow(matrix_gam),], aes(1:nrow(matrix_gam)))+
  labs('lab')+
  geom_line(aes(y=Load, color="Real"), size = 0.8)+
  geom_line(aes(y = Predict, color = "Predict"), size = 0.8)
```



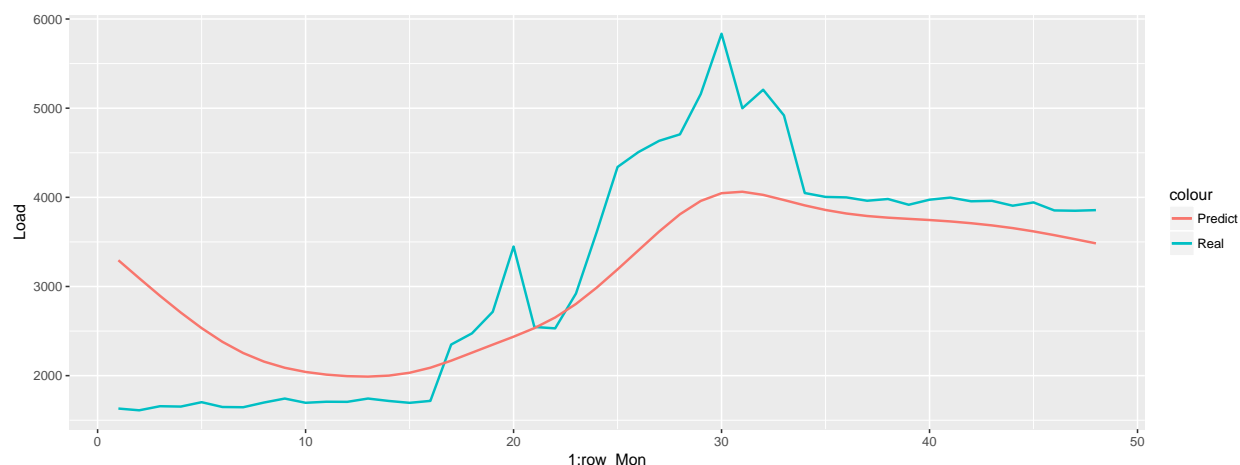
看上去狀況並不好，仔細看第一個禮拜的情況

```
row_Mon <- nrow(matrix_gam)/2
matrix_gam$Predict=gam_1$fitted.values
ggplot(matrix_gam[1:row_Mon,], aes(1:row_Mon))+
  labs('lab')+
  geom_line(aes(y=Load, color="Real"), size = 0.8)+
  geom_line(aes(y = Predict, color = "Predict"), size = 0.8)
```



這個模型只能預測平日用電的趨勢，而具體電耗值卻沒辦法準確預測。在仔細看看禮拜一的用電狀況

```
row_Mon <- nrow(matrix_gam)/14
matrix_gam$Predict=gam_1$fitted.values
ggplot(matrix_gam[1:row_Mon,], aes(1:row_Mon))+
  labs('lab')+
  geom_line(aes(y=Load, color="Real"), size = 0.8)+
  geom_line(aes(y = Predict, color = "Predict"), size = 0.8)
```

問題在於：這天開始的實際用電量與這天結束時的用電量並不吻合，然而模型卻給出了一天週期性的預測結果，這跟實際狀況不一致。因此我們需要換一個思路重建模型。

這回，我們使用 `interaction` 的方法，把 `Daily` 和 `Weekly` 同時進行考量，重建模型，

```
gam_2 <- gam(Load ~ s(Daily, Weekly),
             data = matrix_gam,
             family = gaussian)

summary(gam_2)$r.sq
```

```
## [1] 0.9352108
```

```
summary(gam_2)$sp.criterion
```

```
## GCV.Cp
## 71162.37
```

根據 `R.sq` 和 `p-value` 可以看出，這個模型比上一個模型來的更好

畫出這個模型的預測結果和實際結果的比較

```
datas <- rbindlist(list(data_r[, .(value, date_time)],
                       data.table(value = gam_2$fitted.values,
                                  data_time = data_r[, date_time])))
datas[, type := c(rep("Real", nrow(data_r)), rep("Fitted", nrow(data_r)))]
```

```
ggplot(data = datas, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Fit from GAM n.2")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>
```

[illegible]

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for <b8>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <b8>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <89>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <88>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '鎰 27' in 'mbsToSbs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '鎰 27' in 'mbsToSbs': dot substituted for <ba>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '鎰 27' in 'mbsToSbs': dot substituted for <8c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '鎰 27' in 'mbsToSbs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '鎰 27' in 'mbsToSbs': dot substituted for <9c>  
  
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## conversion failure on '鎰 27' in 'mbsToSbs': dot substituted for <88>  
  
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## conversion failure on '銖 05' in 'mbsToSbs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 05' in 'mbsToSbs': dot substituted for <b8>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e4>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <ba>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <8c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>
```

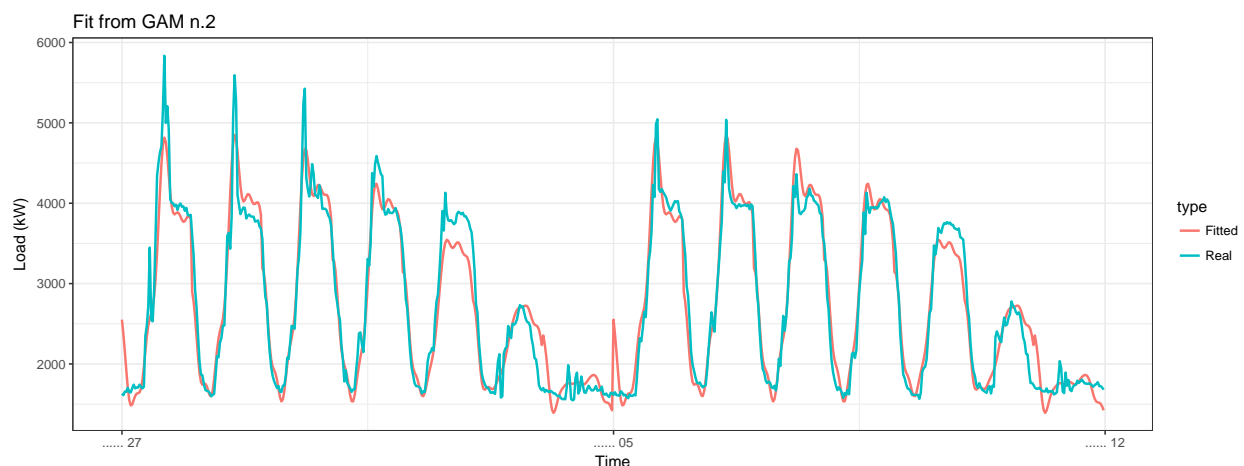
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
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```

```
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```



這回明顯可以看出：禮拜一到禮拜四的擬合效果提升了不少

接著使用另一種更進階的 Interaction 方法，這回使用另外一種稱為“tensor product”的 smooth function 類型

```
gam_3 <- gam(Load ~ te(Daily, Weekly,
                      bs = c("cr", "ps")),
             data = matrix_gam,
             family = gaussian)

summary(gam_3)$r.sq
```

```
## [1] 0.9268452
```

```
summary(gam_3)$sp.criterion
```

```
## GCV.Cp
```

```
## 79724.9
```

作圖分析 gam_3

```
datas <- rbindlist(list(data_r[, .(value, date_time)],
                       data.table(value = gam_3$fitted.values,
                                   data_time = data_r[, date_time])))
datas[, type := c(rep("Real", nrow(data_r)), rep("Fitted", nrow(data_r)))]

ggplot(data = datas, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Fit from GAM n.3")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbsToSbcs': dot substituted for <ba>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbsToSbcs': dot substituted for <8c>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

```

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```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
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```



```

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```

```

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```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖    05' in 'mbscToSbcs': dot substituted for <88>  
  
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## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <89>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <88>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <ba>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <c8>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖   12' in 'mbscToSbcs': dot substituted for <88>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

```



```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 05' in 'mbsToSbcs': dot substituted for <e4>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbsToSbcs': dot substituted for <89>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbsToSbcs': dot substituted for <b8>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <ba>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <8c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <9c>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for
## <e4>
```

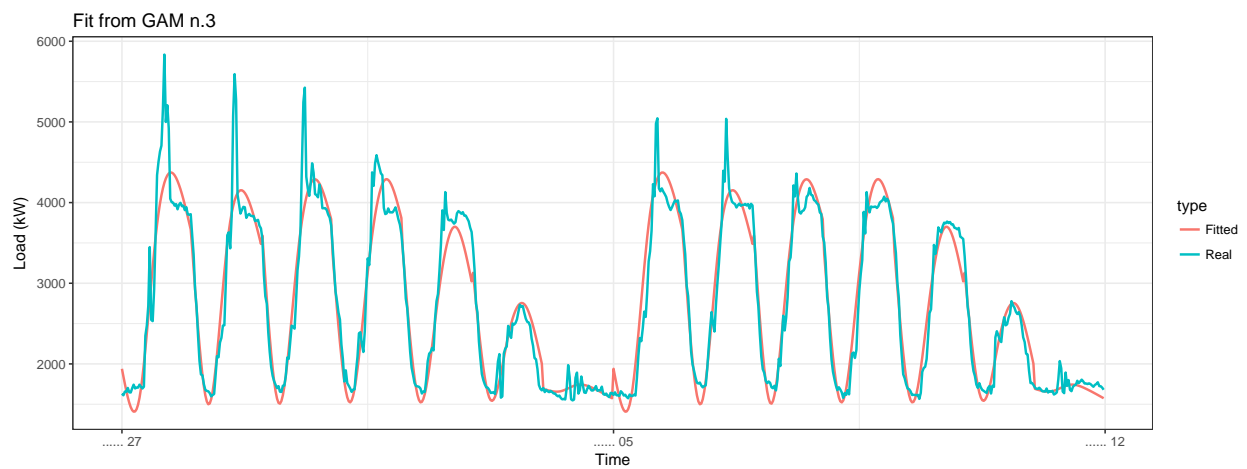
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for
## <88>
```



我們還可以做得更好，比如讓 smooth function 的 knots（類似維度的概念）更接近每天和每周的週期性情況

```
gam_4 <- gam(Load ~ te(Daily, Weekly,
                      k = c(period, 7),
                      bs = c("cr", "ps")),
            data = matrix_gam,
            family = gaussian)

summary(gam_4)$r.sq
```

```
## [1] 0.9727604
```



```
summary(gam_4)$sp.criterion
```

```
## GCV.Cp
```

```
## 34839.46
```

可以看見 R-sq 又上升了一點點，關鍵是 edf value 上升了 5 倍之多。

畫出 gam_4 的圖像

```
datas <- rbindlist(list(data_r[, .(value, date_time)],
                        data.table(value = gam_4$fitted.values,
                                   data_time = data_r[, date_time])))
datas[, type := c(rep("Real", nrow(data_r)), rep("Fitted", nrow(data_r)))]

ggplot(data = datas, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Fit from GAM n.4")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>
```

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## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```
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```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

```

[illegible]

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <b8>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <89>  
  
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## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <88>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <ba>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <8c>  
  
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## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 05' in 'mbsToSbs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 05' in 'mbsToSbs': dot substituted for <b8>  
  
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## conversion failure on '銖 05' in 'mbsToSbs': dot substituted for <89>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <ba>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <8c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <e4>

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## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <b8>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>
```

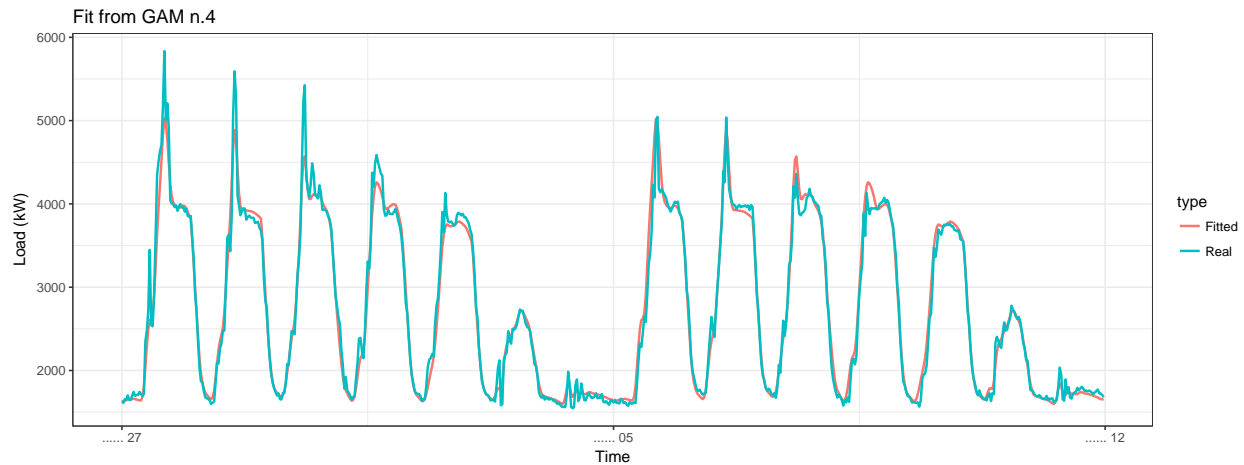
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
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```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```



好了，加入我們想要貪婪一點，把前面的一些方法都加進來，結果會怎麼樣呢？這裡構建一個 `gam_5` 來驗證一下

```
gam_5 <- gam(Load ~ s(Daily, bs = "cr", k = period) +
              s(Weekly, bs = "ps", k = 7) +
              ti(Daily, Weekly,
                 k = c(period, 7),
                 bs = c("cr", "ps")),
              data = matrix_gam,
              family = gaussian)

summary(gam_5)$r.sq
```

```
## [1] 0.9717469
```

```
summary(gam_5)$sp.criterion
```

```
## GCV.Cp
## 35772.35
```

雖然 p-value 一樣為 0，R-sq 數值下降了一點，GCV 數值上升了，說明這個模型不如前面的 `gam_4` 來的好 ## 畫出 `gam_5` 的圖像

```
datas <- rbindlist(list(data_r[, .(value, date_time)],
                        data.table(value = gam_5$fitted.values,
                                   data_time = data_r[, date_time])))
```

```

datas[, type := c(rep("Real", nrow(data_r)), rep("Fitted", nrow(data_r)))]

ggplot(data = datas, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Fit from GAM n.5")

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <e6>

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```

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```
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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for
## <e4>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <ba>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <8c>
```

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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
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## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>

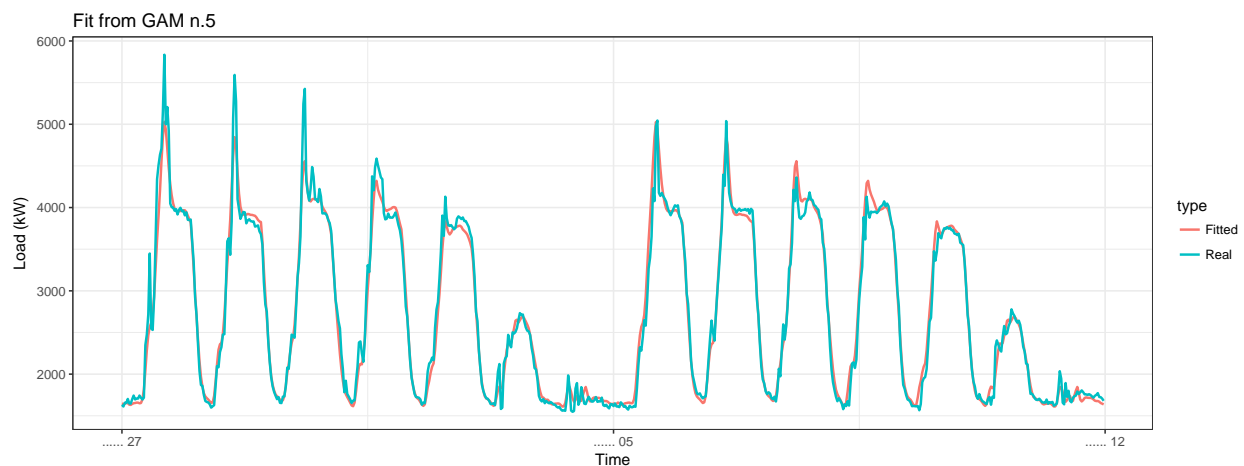
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
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## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```



呼～，這回是最後一個招數了，這裡再多嘗試一個 tensor product interactions 方法，並設定 `full = TRUE` 來設定更加嚴格的懲罰條件

```
gam_6 <- gam(Load ~ t2(Daily, Weekly,
                      k = c(period, 7),
                      bs = c("cr", "ps"),
                      full = TRUE),
            data = matrix_gam,
            family = gaussian)

summary(gam_6)$r.sq
```

```
## [1] 0.9738273
```

```
summary(gam_6)$sp.criterion
```

```
## GCV.Cp
## 32230.68
```

畫圖分析 gam_6 的效果

```
datas <- rbindlist(list(data_r[, .(value, date_time)],
                      data.table(value = gam_6$fitted.values,
                                data_time = data_r[, date_time])))
datas[, type := c(rep("Real", nrow(data_r)), rep("Fitted", nrow(data_r)))]

ggplot(data = datas, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Fit from GAM n.6")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>
```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <b8>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <89>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <e6>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 12' in 'mbsToSbs': dot substituted for <88>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <e4>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <ba>  
  
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## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <8c>  
  
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## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <e6>  
  
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## conversion failure on '銖 27' in 'mbsToSbs': dot substituted for <9c>  
  
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :  
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## conversion failure on '銖 05' in 'mbsToSbs': dot substituted for <b8>  
  
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## conversion failure on '銖 05' in 'mbsToSbs': dot substituted for <89>
```

```

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```

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```

[illegible]


```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

```

```

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

```

```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

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```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <ba>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <8c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <9c>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 27' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
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```

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## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 05' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for
## <e4>
```

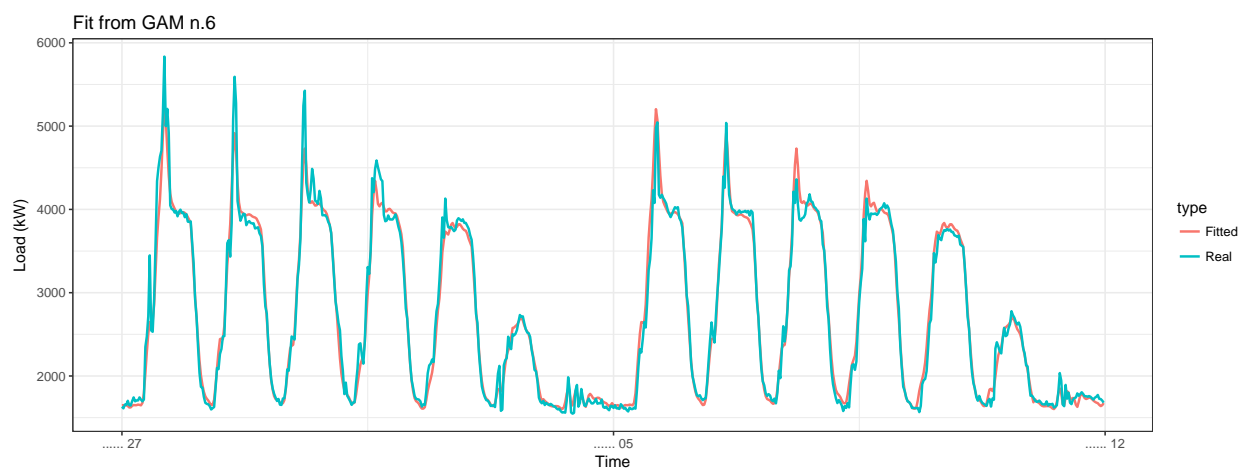
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銚 12' in 'mbcsToSbcs': dot substituted for
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```



這個圖就看上去漂亮很多了

這麼多模型，要怎麼看誰的效果最好呢？交給萬能的 AIC 來解決吧

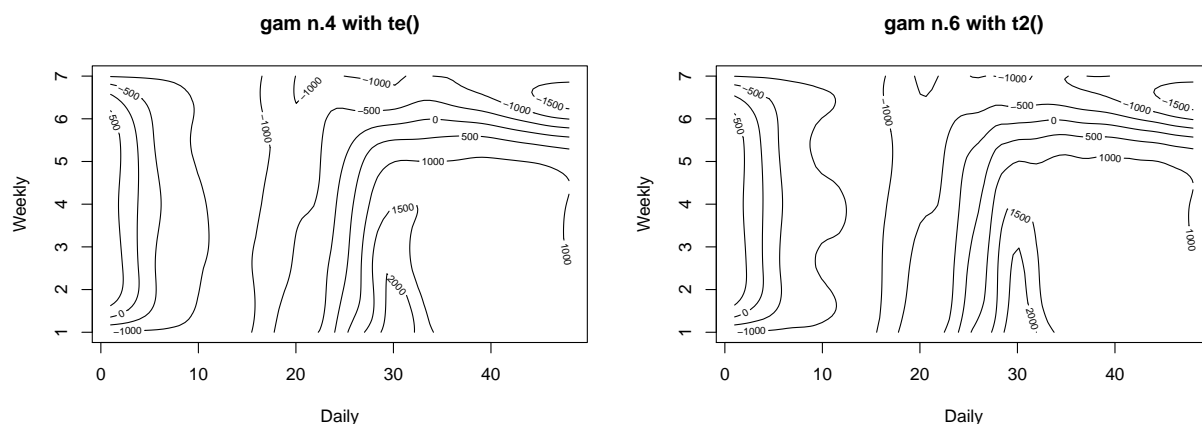
```
AIC(gam_1, gam_2, gam_3, gam_4, gam_5, gam_6)
```

```
##           df      AIC
## gam_1  17.46996 10248.993
## gam_2  30.70080  9415.768
## gam_3  25.65709  9492.545
## gam_4 121.41166  8912.611
## gam_5 115.80849  8932.746
## gam_6 100.12005  8868.628
```

很明顯 gam_4, gam_5, gam_6 是優勝組，其中 gam_6 是最好的那一個，緊隨其後的是 gam_4

接下來就 `gam_4`, `gam_6` 這幾個模型單獨畫圖看看結果是什麼樣的吧

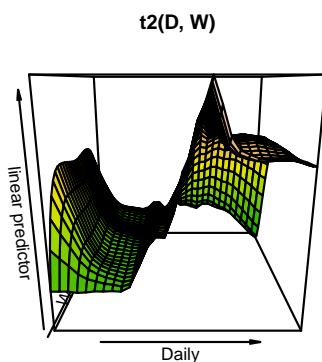
```
layout(matrix(1:2, nrow = 1))
plot(gam_4, rug = FALSE, se = FALSE, n2 = 80, main = "gam n.4 with te()")
plot(gam_6, rug = FALSE, se = FALSE, n2 = 80, main = "gam n.6 with t2()")
```



這些類似等高線的圖像顯示了各個模型對 `Weekly` 和 `Daily` 的反應情況。`gam_4`, `gam_6` 類似，但 `gam_6` 的圖形有更多的波動性，說明它的靈敏程度更好。

最後在這個章節結束前，看看怎麼把 `gam_6` 的圖像畫得更好看吧。首先使用 `mgcv` 套件包裡的 `vis.gam` 功能

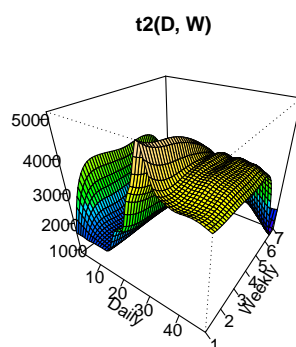
```
# vis.gam(gam_6, main = "t2(D, W)", plot.type = "contour",
#         color = "terrain", contour.col = "black", lwd = 2)
vis.gam(gam_6, main = "t2(D, W)",
        color = "terrain", contour.col = "black", lwd = 2)
```



可以看出，平日的用電量比週末來得多很多，每天的工作時間用電量比較大，禮拜一到禮拜四的下午 3 點左右是用電最高峰時期。

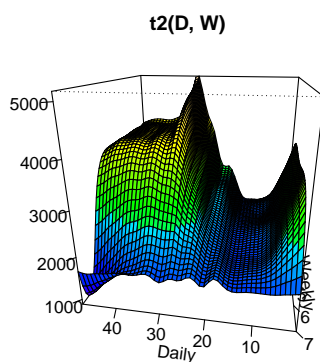
加入不使用 `contour.col` 選項，還可以作一個 3D 版本的圖

```
vis.gam(gam_6, n.grid = 50, theta = 35, phi = 32, zlab = "",
        ticktype = "detailed", color = "topo", main = "t2(D, W)")
```



轉換一下視角

```
vis.gam(gam_6, n.grid = 50, theta = 190, phi = 20, zlab = "",
        ticktype = "detailed", color = "topo", main = "t2(D, W)")
```



3. 分析解釋變量的重要情況

現在來看看減少剔除部分解釋變數對模型的有什麼樣的影響

```
gam_6D <- gam(Load ~ t2(Daily,
                        k = period,
                        bs = "cr",
                        full = TRUE),
              data = matrix_gam,
              family = gaussian)

summary(gam_6D)$r.sq
```

```
## [1] 0.5129567
```

```
summary(gam_6D)$sp.criterion
```

```
## GCV.Cp
```

```
## 518169.2
```

嗯，明顯效果變差了

這回剔除 Daily 這個因素

```
gam_6W <- gam(Load ~ t2(Weekly,
                        k = 7,
                        bs = "ps",
                        full = TRUE),
              data = matrix_gam,
              family = gaussian)

summary(gam_6W)$r.sq
```

```
## [1] 0.2502016
```

```
summary(gam_6W)$sp.criterion
```

```
## GCV.Cp
```

```
## 791454.6
```

可以看到這下效果更糟糕了

保持著嚴謹的態度，使用 `anova` 來比較這三個模型的差異

先看看剔除 `Weekly` 會造成怎麼樣的差異

```
anova(gam_6, gam_6D, test="F")

## Analysis of Deviance Table
##
## Model 1: Load ~ t2(Daily, Weekly, k = c(period, 7), bs = c("cr", "ps"),
##   full = TRUE)
## Model 2: Load ~ t2(Daily, k = period, bs = "cr", full = TRUE)
##   Resid. Df Resid. Dev      Df   Deviance      F    Pr(>F)
## 1      550.77   15740821
## 2      661.13  339050831 -110.37 -323310010 106.61 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

再看看剔除 `Daily` 會造成怎麼樣的差異

```
anova(gam_6, gam_6W, test="F")

## Analysis of Deviance Table
##
## Model 1: Load ~ t2(Daily, Weekly, k = c(period, 7), bs = c("cr", "ps"),
##   full = TRUE)
## Model 2: Load ~ t2(Weekly, k = 7, bs = "ps", full = TRUE)
##   Resid. Df Resid. Dev      Df   Deviance      F    Pr(>F)
## 1      550.77   15740821
## 2      667.88  526095056 -117.11 -510354235 158.6 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

結果顯而易見，`Weekly` 因素和 `Daily` 因素缺一不可！

作圖展示不考慮 `Weekly` 因素的模型的擬合效果：

```

datas <- rbindlist(list(data_r[, .(value, date_time)],
                        data.table(value = gam_6D$fitted.values,
                                   data_time = data_r[, date_time])))
datas[, type := c(rep("Real", nrow(data_r)), rep("Fitted", nrow(data_r)))]

ggplot(data = datas, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Fit from GAM n.6")

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <b8>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銑 05' in 'mbcsToSbcs': dot substituted for <e6>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

```

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```

[illegible]

```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

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```

```

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```

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```

```

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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

```

[illegible]

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銚 27' in 'mbsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銚 27' in 'mbsToSbcs': dot substituted for <88>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銚 12' in 'mbsToSbcs': dot substituted for <88>

```



```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for
## <ba>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for
## <8c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for
## <e6>
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## $y, : conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for
## <9c>
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
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## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <88>
```

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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>
```

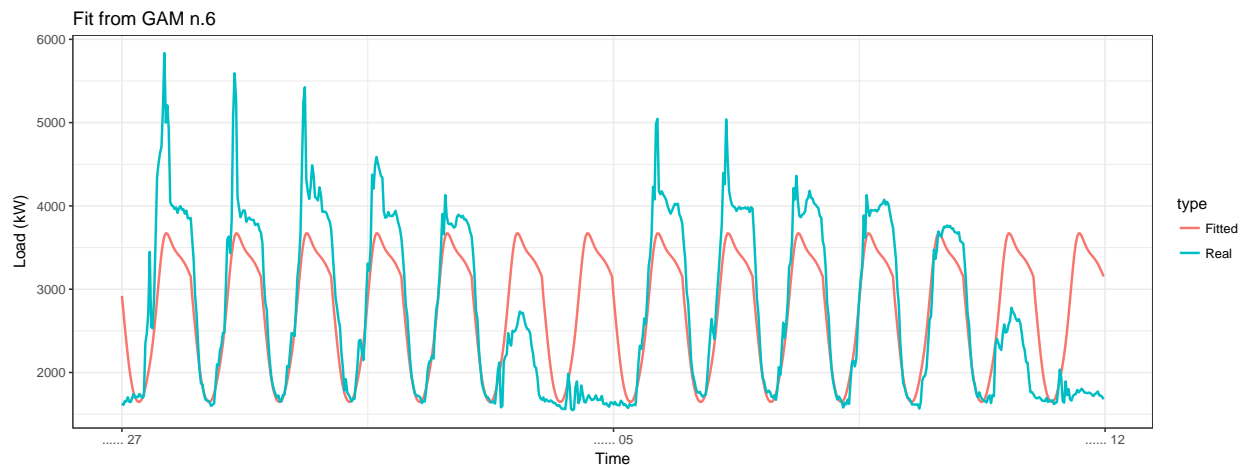
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
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```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
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## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
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## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```



可以看出沒有考慮 Weekly 因素的話，預測結果不會體現週次不同所造成的用電起伏變化

作圖展示不考慮 Daily 因素的模型的擬合效果：

```
datas <- rbindlist(list(data_r[, .(value, date_time)],
                        data.table(value = gam_6W$fitted.values,
                                   data_time = data_r[, date_time])))
datas[, type := c(rep("Real", nrow(data_r)), rep("Fitted", nrow(data_r)))]

ggplot(data = datas, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Fit from GAM n.6")

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

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## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

[illegible]

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <88>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for <ba>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <8c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '鑒 27' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <ba>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <8c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 27' in 'mbcsToSbcs': dot substituted for
## <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <89>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 05' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>
```

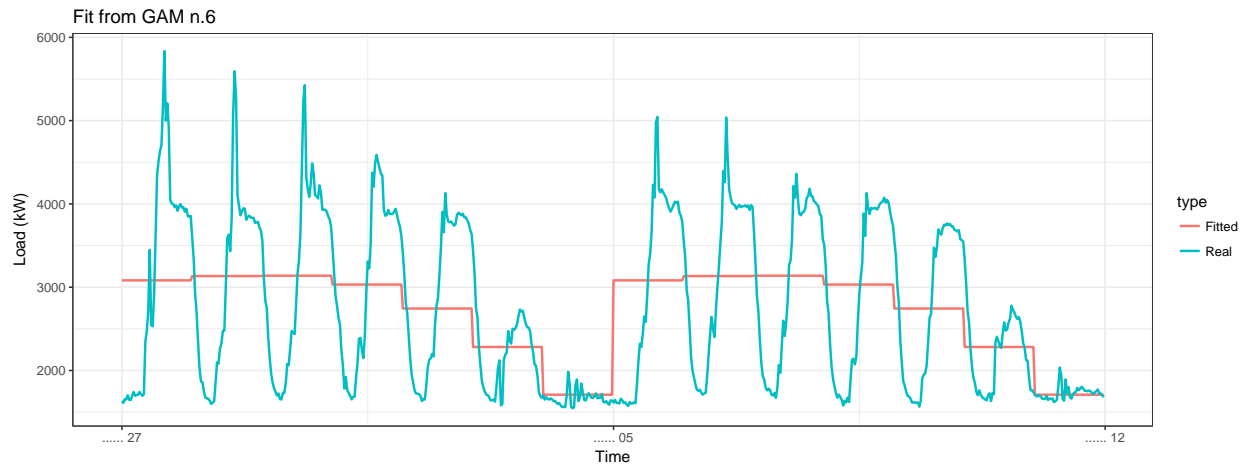
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```



可以看出沒有考慮 Daily 因素的話，預測結果不會體現一天 24 小時內的用電起伏變化

```
predWeek <- function(data, set_of_date){

  # Subsetting the dataset by dates
  data_train <- data[date %in% set_of_date]

  N <- nrow(data_train)
  window <- N / period # number of days in the train set
  # 1, ..., period, 1, ..., period - and so on for the daily season
  # Using feature "week_num" for the weekly season
  matrix_train <- data.table(Load = data_train[, value],
                             Daily = as.factor(rep(1:period, window)),
                             Weekly = as.factor(data_train[, week_num]))

  # Creation of the model
  lm_m <- lm(Load ~ 0 + Daily + Weekly + Daily:Weekly, data = matrix_train)

  # Creation of the forecast for one week ahead
  pred_week <- predict(lm_m, matrix_train[1:(7*period), -1, with = FALSE])

  return(as.vector(pred_week))
}
```

4. 預測電耗

最後，最振奮人心的——預測接下來兩周的用電量

```
data_test <- DT[(type == n_type[1] & date %in% n_date[71:84])]
matrix_test <- data.table(Load = data_test[, value],
                          Daily = rep(1:period, window),
                          Weekly = data_test[, week_num])
pred_week <- predict(gam_6, matrix_test[1:(7*period)], interval="confidence", level = 0.95)

datat <- rbindlist(list(data_test[, .(value, date_time)],
                        data.table(value = pred_week,
                                    date_time = data_test[, date_time])))
datat[, type := c(rep("Real", nrow(data_test)), rep("Predicted", nrow(data_test)))]
ggplot(data = datat, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Predicted result on GAM n.6")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <b8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <89>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <e6>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <9c>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbsToSbcs': dot substituted for <88>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbsToSbcs': dot substituted for <e4>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

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## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

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```



```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

```

```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <89>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e6>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <9c>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <b8>

```



```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
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```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <e4>
```

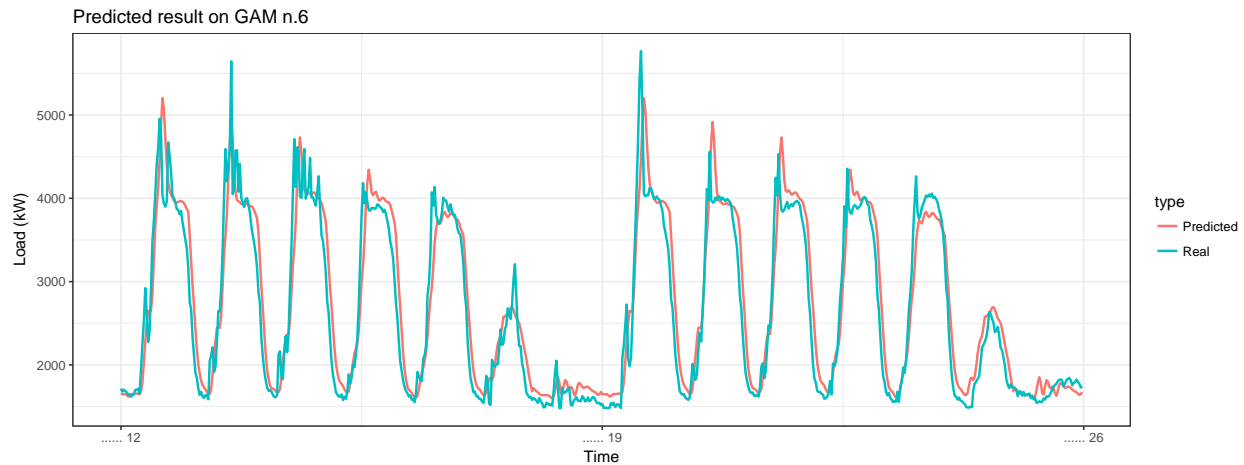
```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <88>
```



預測接下來一個月的用電量

```
data_test <- DT[(type == n_type[1] & date %in% n_date[71:98])]
matrix_test <- data.table(Load = data_test[, value],
                          Daily = rep(1:period, window),
                          Weekly = data_test[, week_num])
pred_week <- predict(gam_6, matrix_test[1:(7*period)], interval="confidence", level = 0.95)

datat <- rbindlist(list(data_test[, .(value, date_time)],
                        data.table(value = pred_week,
                                   date_time = data_test[, date_time])))
datat[, type := c(rep("Real", nrow(data_test)), rep("Predicted", nrow(data_test)))]
ggplot(data = datat, aes(date_time, value, group = type, colour = type)) +
  geom_line(size = 0.8) +
  theme_bw() +
  labs(x = "Time", y = "Load (kW)",
       title = "Predicted result on GAM n.6")
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>
```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

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## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

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## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

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## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

```

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## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  26' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

```

```
## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>
```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  26' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <9b>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  銖  19' in 'mbcsToSbcs': dot substituted for <9c>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for <e5>

```



```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9c>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  12' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖  19' in 'mbcsToSbcs': dot substituted for <e4>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e4>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <b8>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <89>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for <9b>

```

```

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  02' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e5>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9b>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <e6>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <9c>

## Warning in grid.Call(C_textBounds, as.graphicsAnnot(x$label), x$x, x$y, :
## conversion failure on '  09' in 'mbcsToSbcs': dot substituted for <88>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e4>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <b8>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <89>

## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <e6>

```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 12' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 19' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <e4>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <b8>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <89>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on '銖 26' in 'mbcsToSbcs': dot substituted for
## <88>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for
## <e5>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for
## <9b>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for
## <9b>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 02' in 'mbcsToSbcs': dot substituted for
## <88>
```



```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for
## <e5>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for
## <9b>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for
## <9b>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for
## <e6>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for
## <9c>
```

```
## Warning in grid.Call.graphics(C_text, as.graphicsAnnot(x$label), x$x, x
## $y, : conversion failure on ' 09' in 'mbcsToSbcs': dot substituted for
## <88>
```

