110 學年度第二學期科學計算軟體作業一

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※ 各題請附上答案及程式碼

1. 請算出 2009-2011 每一年全台溫度之最大值、最小值、平均值、標準差以及四分位數(每一填空 5 分共 75 分 ; 請將各數值四捨五入取到小數第二位 , **若未達到則會斟酌扣分**)。

   答案 :

年度	2009	2010	2011
最大值	30.92	31.09	31.08
最小值	10.04	11.06	7.43
平均值	23.94	23.69	23.28
標準差	4.69	4.49	5.22
Q1	20.33	20.08	18.13
Q2	24.33	24.07	24.30
Q3	28.55	27.92	28.30

程式碼：

```
#1##################################################
data2009<-dataset[dataset$year == "2009", ]
data2010<-dataset[dataset$year == "2010", ]
data2011<-dataset[dataset$year == "2011", ]

#max#################################################
max(data2009$溫度,na.rm = TRUE)
max(data2010$溫度,na.rm = TRUE)
max(data2011$溫度,na.rm = TRUE)

#min#################################################
min(data2009$溫度,na.rm = TRUE)
min(data2010$溫度,na.rm = TRUE)
min(data2011$溫度,na.rm = TRUE)

#mean################################################
round(mean(data2009$溫度,na.rm=TRUE), digits = 2)
round(mean(data2010$溫度,na.rm=TRUE), digits = 2)
round(mean(data2011$溫度,na.rm=TRUE), digits = 2)

#Standard Deviation##################################
round(sd(data2009$溫度,na.rm = TRUE), digits = 2)
round(sd(data2010$溫度,na.rm = TRUE), digits = 2)
round(sd(data2011$溫度,na.rm = TRUE), digits = 2)

#quantile1###########################################################
round(quantile(data2009$溫度,0.25,na.rm = TRUE), digits = 2)
round(quantile(data2010$溫度,0.25,na.rm = TRUE), digits = 2)
round(quantile(data2011$溫度,0.25,na.rm = TRUE), digits = 2)

#quantile2###########################################################
round(quantile(data2009$溫度,0.50,na.rm = TRUE), digits = 2)
round(quantile(data2010$溫度,0.50,na.rm = TRUE), digits = 2)
round(quantile(data2011$溫度,0.50,na.rm = TRUE), digits = 2)

#quantile3###########################################################
round(quantile(data2009$溫度,0.75,na.rm = TRUE), digits = 2)
round(quantile(data2010$溫度,0.75,na.rm = TRUE), digits = 2)
round(quantile(data2011$溫度,0.75,na.rm = TRUE), digits = 2)
```

執行結果：

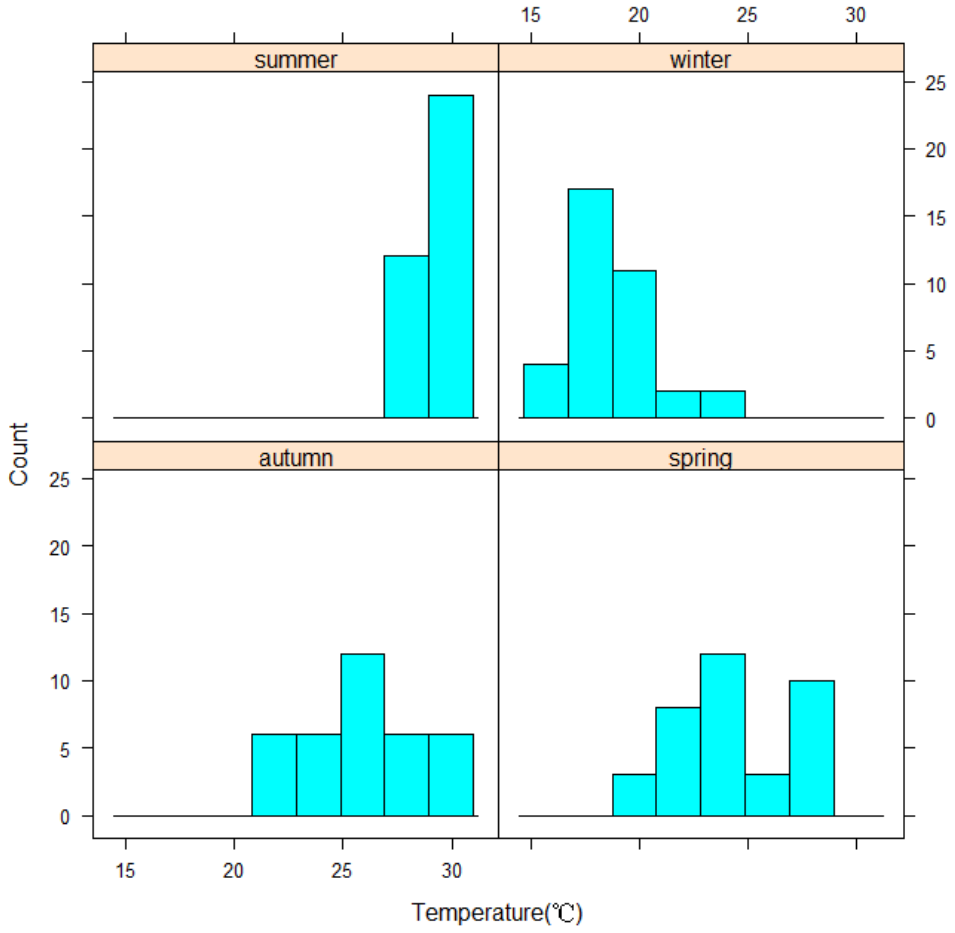
```
> #1################################################
> data2009<-dataset[dataset$year == "2009", ]
> data2010<-dataset[dataset$year == "2010", ]
> data2011<-dataset[dataset$year == "2011", ]
>
> #max##############################################
> max(data2009$溫度,na.rm = TRUE)
[1] 30.92
> max(data2010$溫度,na.rm = TRUE)
[1] 31.09
> max(data2011$溫度,na.rm = TRUE)
[1] 31.08
>
> #min##############################################
> min(data2009$溫度,na.rm = TRUE)
[1] 10.04
> min(data2010$溫度,na.rm = TRUE)
[1] 11.06
> min(data2011$溫度,na.rm = TRUE)
[1] 7.43
>
> #mean#############################################
> round(mean(data2009$溫度,na.rm=TRUE), digits = 2)
[1] 23.94
> round(mean(data2010$溫度,na.rm=TRUE), digits = 2)
[1] 23.69
> round(mean(data2011$溫度,na.rm=TRUE), digits = 2)
[1] 23.28
>
> #Standard Deviation###############################
> round(sd(data2009$溫度,na.rm = TRUE), digits = 2)
[1] 4.69
> round(sd(data2010$溫度,na.rm = TRUE), digits = 2)
[1] 4.49
> round(sd(data2011$溫度,na.rm = TRUE), digits = 2)
[1] 5.22
```

```
> #quantile1################################################
> round(quantile(data2009$溫度,0.25,na.rm = TRUE), digits = 2)
  25%
20.33
> round(quantile(data2010$溫度,0.25,na.rm = TRUE), digits = 2)
  25%
20.08
> round(quantile(data2011$溫度,0.25,na.rm = TRUE), digits = 2)
  25%
18.13
>
> #quantile2################################################
> round(quantile(data2009$溫度,0.50,na.rm = TRUE), digits = 2)
  50%
24.33
> round(quantile(data2010$溫度,0.50,na.rm = TRUE), digits = 2)
  50%
24.07
> round(quantile(data2011$溫度,0.50,na.rm = TRUE), digits = 2)
 50%
24.3
>
> #quantile3################################################
> round(quantile(data2009$溫度,0.75,na.rm = TRUE), digits = 2)
  75%
28.55
> round(quantile(data2010$溫度,0.75,na.rm = TRUE), digits = 2)
  75%
27.92
> round(quantile(data2011$溫度,0.75,na.rm = TRUE), digits = 2)
 75%
28.3
```

2. 請畫出全年**臺南市地區不同季節**下溫度之直方圖(25 分；請依照 2 column, 2 row 呈現，X 軸命名為 Temperature(℃)，Y 軸命名為 Count；**答題提醒:12-2 月為冬季，3-5 月春季，6-8 月為夏季，9-11 月為秋季，不用根據季節取平均值來畫圖；**以上若未達到皆會斟酌扣分)。

答案：

```
> datatainan <- read.csv("temp.csv")
> datawinter<-datatainan[datatainan$season == "冬", ]
> dataspring<-datatainan[datatainan$season == "春", ]
> datasummer<-datatainan[datatainan$season == "夏", ]
> dataautumn<-datatainan[datatainan$season == "秋", ]
> histogram(x= ~溫度|season,data =datatainan, xlab = "Temperature(℃)",ylab = "Count",type="count",layout=c(2,2))
```



程式碼：

```
#2#################################################
datatainan <- read.csv("temp.csv")
datawinter<-datatainan[datatainan$season == "冬", ]
dataspring<-datatainan[datatainan$season == "春", ]
datasummer<-datatainan[datatainan$season == "夏", ]
dataautumn<-datatainan[datatainan$season == "秋", ]
histogram(x= ~溫度|season,data =datatainan, xlab = "Temperature(℃)",ylab = "Count",type="count",layout=c(2,2))
```