2020/10/23(五), 109 學年第一學期 資料科學應用 R 作業(1)

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(請依照規定)貼上執行程式碼及執行結果。
詳見: R 程式作業繳交方式
http://www.hmwu.idv.tw/web/teaching/doc/R-how-homework.pdf

```
> #2020/10/23
>
> #ex1.7(a)
> rep(LETTERS[1:5], seq(5, 1, -1))
 [1] "A" "A" "A" "A" "A" "B" "B" "B" "B" "C" "C" "C" "D" "D" "E"
>
> #ex1.7(b)
> c <- letters
> c(c[seq(2, 26, by = 2)],c[seq(1, 26, by = 2)])
 [1] "b" "d" "f" "h" "j" "l" "n" "p" "r" "t" "v" "x" "z" "a" "c" "e" "g" "i" "k" "m"
[21] "o" "q" "s" "u" "w" "y"
>
> #ex1.7(c)
> n <- seq(1, 100)
> (-1)^(n+1)*1/n
  [1]  1.00000000 -0.50000000  0.33333333 -0.25000000  0.20000000 -
0.16666667
  [7]  0.14285714 -0.12500000  0.11111111 -0.10000000  0.09090909 -
0.08333333
 [13]  0.07692308 -0.07142857  0.06666667 -0.06250000  0.05882353 -
0.05555556
 [19]  0.05263158 -0.05000000  0.04761905 -0.04545455  0.04347826 -
0.04166667
 [25]  0.04000000 -0.03846154  0.03703704 -0.03571429  0.03448276 -
0.03333333
 [31]  0.03225806 -0.03125000  0.03030303 -0.02941176  0.02857143 -
0.02777778
 [37]  0.02702703 -0.02631579  0.02564103 -0.02500000  0.02439024 -
0.02380952
 [43]  0.02325581 -0.02272727  0.02222222 -0.02173913  0.02127660 -
```

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0.02083333
 [49]  0.02040816 -0.02000000  0.01960784 -0.01923077  0.01886792 -
0.01851852
 [55]  0.01818182 -0.01785714  0.01754386 -0.01724138  0.01694915 -
0.01666667
 [61]  0.01639344 -0.01612903  0.01587302 -0.01562500  0.01538462 -
0.01515152
 [67]  0.01492537 -0.01470588  0.01449275 -0.01428571  0.01408451 -
0.01388889
 [73]  0.01369863 -0.01351351  0.01333333 -0.01315789  0.01298701 -
0.01282051
 [79]  0.01265823 -0.01250000  0.01234568 -0.01219512  0.01204819 -
0.01190476
 [85]  0.01176471 -0.01162791  0.01149425 -0.01136364  0.01123596 -
0.01111111
 [91]  0.01098901 -0.01086957  0.01075269 -0.01063830  0.01052632 -
0.01041667
 [97]  0.01030928 -0.01020408  0.01010101 -0.01000000
> #ex1.7(d)
> z1 <- month.abb
> length(z1)
[1] 12
> c(z1[seq(from = 2, to = 12, by = 2)], z1[seq(from = 1, to = 12, by = 2)])
 [1] "Feb" "Apr" "Jun" "Aug" "Oct" "Dec" "Jan" "Mar" "May" "Jul" "Sep" "Nov"
>
> #ex1.23(a)
> math.score <- c(43, 94, 20, 8, 46, 72, 93, 8, 28, 33, 79, 60, 93, 52, 8)
>
> #ex1.23(b)
> length(math.score)
[1] 15
>
> #ex1.23(c)
> y <- seq(from = 2, to = 12, by = 2)
> math.score[y]
[1] 94  8 72  8 33 60
> mean(math.score[y])
[1] 45.83333
```

```
>
> #ex1.23(d)
> sp <- 1:length(math.score)
> sp[math.score > 60]
[1]  2  6  7 11 13
> mean(math.score[y])
[1] 45.83333
>
> #ex1.37(a)
> age <- c(54, 64, 75, 21, 66, 49, 25, 72, 50, 72)
> gender <- c("f", "m", "m", "f", "f", "m", "m", "m", "f", "m", "f")
> index <- c(86, 30, NA, 43, 35, 42, 31, 7, 29, 80)
> sat <- c("b", "a", "d", "a", "c", "d", "c", "b", "c", "a")
> levels(sat)
NULL
> sat.f <- factor(sat)
> levels(sat.f)
[1] "a" "b" "c" "d"
> levels(sat.f) <- c("非常滿意", "滿意", "普通", "非常不滿意")
> sat.f
 [1] 滿意       非常滿意   非常不滿意 非常滿意   普通       非常不滿
意 普通
 [8] 滿意       普通       非常滿意
Levels: 非常滿意 滿意 普通 非常不滿意
>
> #ex1.37(b)
> sp1 <- 1:length(sat)
> sp1[sat <= "b"]
[1]  1  2  4  8 10
> length(sp1[sat <= "b"])
[1] 5
>
> #ex1.37(c)
> sp2 <- 1:length(age)
> sp3 <- 1:length(gender)
> X <- age > 40
> Y <- gender == "m"
> sp2[X]
```

```
[1]  1  2  3  5  6  8  9 10
> sp3[Y]
[1]  2  3  6  7  8 10
> intersect(sp2[X], sp3[Y])
[1]  2  3  6  8 10
> mean(index[intersect(sp2[X], sp3[Y])])
[1] NA
>
```