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"
[10] "C" "C" "C" "D" "D" "E"
>
> #ex1.7(b)
>
> x <- letters[1:26]
> c(x[seq(from = 2, to = 26, by = 2)], x[seq(from = 1, to = 26, by = 2)])
 [1] "b" "d" "f" "h" "j" "l" "n" "p" "r"
[10] "t" "v" "x" "z" "a" "c" "e" "g" "i"
[19] "k" "m" "o" "q" "s" "u" "w" "y"
>
>
>
> #ex1.7(c)
>
> #install.packages("MASS")
> require(MASS)
> n <- (1:100)
> A <- (-1)^(n+1)*1/n
> fractions (A)
   [1]     1   -1/2    1/3   -1/4    1/5
   [6]  -1/6    1/7   -1/8    1/9  -1/10
  [11]  1/11  -1/12   1/13  -1/14   1/15
  [16] -1/16   1/17  -1/18   1/19  -1/20
```

```
 [21]   1/21  -1/22   1/23  -1/24   1/25
 [26]  -1/26   1/27  -1/28   1/29  -1/30
 [31]   1/31  -1/32   1/33  -1/34   1/35
 [36]  -1/36   1/37  -1/38   1/39  -1/40
 [41]   1/41  -1/42   1/43  -1/44   1/45
 [46]  -1/46   1/47  -1/48   1/49  -1/50
 [51]   1/51  -1/52   1/53  -1/54   1/55
 [56]  -1/56   1/57  -1/58   1/59  -1/60
 [61]   1/61  -1/62   1/63  -1/64   1/65
 [66]  -1/66   1/67  -1/68   1/69  -1/70
 [71]   1/71  -1/72   1/73  -1/74   1/75
 [76]  -1/76   1/77  -1/78   1/79  -1/80
 [81]   1/81  -1/82   1/83  -1/84   1/85
 [86]  -1/86   1/87  -1/88   1/89  -1/90
 [91]   1/91  -1/92   1/93  -1/94   1/95
 [96]  -1/96   1/97  -1/98   1/99 -1/100
>
> #ex1.7(d)
>
> x <- month.abb
> length(x)
[1] 12
> c(x[seq(from = 1, to = 12, by = 2)], x[seq(from = 2, to = 12, by = 2)])
 [1] "Jan" "Mar" "May" "Jul" "Sep" "Nov"
 [7] "Feb" "Apr" "Jun" "Aug" "Oct" "Dec"
>
> #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)
>
> x <- seq(from = 2, to = 12, by = 2)
```

```
> math.score[x]
[1] 94  8 72  8 33 60
> mean(math.score[x])
[1] 45.83333
>
> #ex1.23(d)
>
> id <- 1:length(math.score)
> id[math.score > 60]
[1]  2  6  7 11 13
> mean(math.score[x])
[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", "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
 [4] 非常滿意   普通       非常不滿意
 [7] 普通       滿意       普通
[10] 非常滿意
4 Levels: 非常滿意 滿意 ... 非常不滿意
>
> #ex1.37(b)
>
> id <- 1:length(sat)
> id [sat <= "b"]
[1]  1  2  4  8 10
```

```
> length(id3[sat <= "b"])
[1] 5
>
> #ex1.37(c)
>
> id1 <- 1:length(age)
> id2 <- 1:length(gender)
> x <- age > 40
> y <- gender == "m"
> id1[x]
[1]  1  2  3  5  6  8  9 10
> id2[y]
[1] 2 3 6 7 9
> intersect(id1[x], id2[y])
[1] 2 3 6 9
> mean(index[intersect(id1[x], id2[y])])
[1] NA
>
>
>
>
>
> #加分題
> #1
> rep(1:5, seq(1, 5, 1))
 [1] 1 2 2 3 3 3 4 4 4 4 5 5 5 5 5
>
> #2
> rep(5:1, seq(1, 5, 1))
 [1] 5 4 4 3 3 3 2 2 2 2 1 1 1 1 1
>
> #3
> rep(1:3, times=3)
[1] 1 2 3 1 2 3 1 2 3
>
> #4
> Fibonacci <- numeric(11)
> Fibonacci[0] <- Fibonacci[2] <- 1
```

```
> for (i in 3:11) Fibonacci[i] <- Fibonacci[i - 2] + Fibonacci[i - 1]
> Fibonacci
 [1]  0  1  1  2  3  5  8 13 21 34 55
> #5
> c(rep(1:5, times=1), rep(2:5, times=1), rep(3:5, times=1), rep(4:5, times=1), rep(5:5,
times=1))
 [1] 1 2 3 4 5 2 3 4 5 3 4 5 4 5 5
> #6
>
> seq(from = 1, by = 4:9, len = 6)
[1]  1  6 13 22 33 46
>
> #7
> c(rep(2^0, times = 1), rep((2:3)^1, times = 1), rep((2:3)^2, times = 1), rep((2:3)^3,
times = 1))
[1]  1  2  3  4  9  8 27
```