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

學號: A107260028 姓名: 張雅筑

(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)
> a <- letters[1:26]
> c(a[seq(from = 2, to = 26, by = 2)], a[seq(from = 1, to = 26, by = 2)])
 [1] "b" "d" "f" "h" "j" "l" "n" "p" "r" "t" "v" "x" "z" "a" "c" "e" "g" "i" "k" "m" "o" "q"
"s" "u"
[25] "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    -1/6     1/7    -1/8     1/9   -
1/10    1/11   -1/12    1/13
 [14]  -1/14    1/15   -1/16    1/17   -1/18    1/19   -1/20    1/21   -1/22
1/23   -1/24    1/25   -1/26
 [27]   1/27   -1/28    1/29   -1/30    1/31   -1/32    1/33   -1/34    1/35   -
1/36    1/37   -1/38    1/39
 [40]  -1/40    1/41   -1/42    1/43   -1/44    1/45   -1/46    1/47   -1/48
1/49   -1/50    1/51   -1/52
 [53]   1/53   -1/54    1/55   -1/56    1/57   -1/58    1/59   -1/60    1/61   -
1/62    1/63   -1/64    1/65
```

```
 [66]   -1/66    1/67   -1/68    1/69  -1/70    1/71  -1/72    1/73  -1/74
1/75  -1/76    1/77  -1/78
 [79]    1/79  -1/80    1/81  -1/82    1/83  -1/84    1/85  -1/86    1/87   -
1/88    1/89  -1/90    1/91
 [92]   -1/92    1/93  -1/94    1/95  -1/96    1/97  -1/98    1/99 -1/100
>
> #ex1.7(d)
> c1 <- month.abb
> length(c1)
[1] 12
> c(c1[seq(from = 2, to = 12, by = 2)], c1[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)
> id <- 1:length(math.score)
> id[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", "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        滿意
 [9] 普通        非常滿意
Levels: 非常滿意 滿意 普通 非常不滿意
>
> #ex1.37(b)
> id1 <- 1:length(sat)
> id1[sat <= "b"]
[1]   1   2   4   8 10
> length(id1[sat <= "b"])
[1] 5
>
> #ex1.37(c)
> id2 <- 1:length(age)
> id3 <- 1:length(gender)
> A <- age > 40
> B <- gender == "m"
> id2[A]
[1]   1   2   3   5   6   8   9 10
> id3[B]
[1] 2 3 6 7 9
> intersect(id2[A], id3[B])
[1] 2 3 6 9
> mean(index[intersect(id2[A], id3[B])])
[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
>
```