Homework 2

105304028_統計四_方品謙

1

a. Write a “divide” function

```
divide <- function(x){
  if ( x %% 3 == 0 & x %% 5 == 0 ){return("Divisible")}
  else if (x %% 5 == 0){ return("Divisible5")}
  else if (x %% 3 == 0){ return("Divisible3")}
  else {return(x)} }
```

testing

```
divide(9) # 被3整除
```

```
## [1] "Divisible3"
```

```
divide(20) # 被5整除
```

```
## [1] "Divisible5"
```

```
divide(15) # 被3、5整除
```

```
## [1] "Divisible"
```

```
divide(16) # 不被3、5整除
```

```
## [1] 16
```

b.

```
results <- c()
for (i in 1:100){
  results[i] <- divide(i)
}
results
```

```
##   [1] "1"          "2"          "Divisible3" "4"          "Divisible5"
##   [6] "Divisible3" "7"          "8"          "Divisible3" "Divisible5"
##  [11] "11"         "Divisible3" "13"         "14"         "Divisible"
##  [16] "16"         "17"         "Divisible3" "19"         "Divisible5"
##  [21] "Divisible3" "22"         "23"         "Divisible3" "Divisible5"
##  [26] "26"         "Divisible3" "28"         "29"         "Divisible"
##  [31] "31"         "32"         "Divisible3" "34"         "Divisible5"
##  [36] "Divisible3" "37"         "38"         "Divisible3" "Divisible5"
##  [41] "41"         "Divisible3" "43"         "44"         "Divisible"
##  [46] "46"         "47"         "Divisible3" "49"         "Divisible5"
##  [51] "Divisible3" "52"         "53"         "Divisible3" "Divisible5"
##  [56] "56"         "Divisible3" "58"         "59"         "Divisible"
##  [61] "61"         "62"         "Divisible3" "64"         "Divisible5"
##  [66] "Divisible3" "67"         "68"         "Divisible3" "Divisible5"
##  [71] "71"         "Divisible3" "73"         "74"         "Divisible"
##  [76] "76"         "77"         "Divisible3" "79"         "Divisible5"
##  [81] "Divisible3" "82"         "83"         "Divisible3" "Divisible5"
##  [86] "86"         "Divisible3" "88"         "89"         "Divisible"
##  [91] "91"         "92"         "Divisible3" "94"         "Divisible5"
##  [96] "Divisible3" "97"         "98"         "Divisible3" "Divisible5"
```

2

a.

```
X <- runif(40, min = 0, max = 100)
ε <- runif(40, min = 0, max = 2)
Y = X + ε
Y <- ifelse(round(Y) > 100 , 100 , round(Y))
Y
```

```
##  [1] 44 90 41 24 52 40 66 67 32 13 65 42 57 57 39 79  3  0 17 46 89 70 28 45 38
## [26] 98 49 37 34 53 79 61 97 80 15 28 83 18 42  8
```

b.

```
score <- function(x) {
  CI_1 <- mean(x) - qnorm(0.025)*sd(x)/sqrt(length(x))
  CI_2 <- mean(x) + qnorm(0.025)*sd(x)/sqrt(length(x))
  avg <- mean(x)
  return( data.frame(
          "CI_95%" = paste0("[" , round(CI_1,3) , "," , round(CI_2,3) , "]"),
          "average" = avg ))
}
score(Y)
```

CI_95. <fctr>	average <dbl>
[56.273,40.027]	48.15

1 row