2019150445 통계학과 신백록 통계소 과제

**1.**

> st<-data.frame(state.x77)

**2.**

> str(st)

'data.frame': 50 obs. of 8 variables:

$ Population: num 3615 365 2212 2110 21198 ...

$ Income : num 3624 6315 4530 3378 5114 ...

$ Illiteracy: num 2.1 1.5 1.8 1.9 1.1 0.7 1.1 0.9 1.3 2 ...

$ Life.Exp : num 69 69.3 70.5 70.7 71.7 ...

$ Murder : num 15.1 11.3 7.8 10.1 10.3 6.8 3.1 6.2 10.7 13.9 ...

$ HS.Grad : num 41.3 66.7 58.1 39.9 62.6 63.9 56 54.6 52.6 40.6 ...

$ Frost : num 20 152 15 65 20 166 139 103 11 60 ...

$ Area : num 50708 566432 113417 51945 156361 ...

**3.**

> str(st)

'data.frame': 50 obs. of 8 variables:

$ Population: num 3615 365 2212 2110 21198 ...

$ Income : num 3624 6315 4530 3378 5114 ...

$ Illiteracy: num 2.1 1.5 1.8 1.9 1.1 0.7 1.1 0.9 1.3 2 ...

$ Life.Exp : num 69 69.3 70.5 70.7 71.7 ...

$ Murder : num 15.1 11.3 7.8 10.1 10.3 6.8 3.1 6.2 10.7 13.9 ...

$ HS.Grad : num 41.3 66.7 58.1 39.9 62.6 63.9 56 54.6 52.6 40.6 ...

$ Frost : num 20 152 15 65 20 166 139 103 11 60 ...

$ Area : num 50708 566432 113417 51945 156361 ...

> mode(st)

[1] "list"

> names(st)

[1] "Population" "Income" "Illiteracy" "Life.Exp" "Murder" "HS.Grad" "Frost" "Area"

> length(st)

[1] 8

> row.names(st)

[1] "Alabama" "Alaska" "Arizona" "Arkansas" "California" "Colorado" "Connecticut" "Delaware" "Florida"

[10] "Georgia" "Hawaii" "Idaho" "Illinois" "Indiana" "Iowa" "Kansas" "Kentucky" "Louisiana"

[19] "Maine" "Maryland" "Massachusetts" "Michigan" "Minnesota" "Mississippi" "Missouri" "Montana" "Nebraska"

[28] "Nevada" "New Hampshire" "New Jersey" "New Mexico" "New York" "North Carolina" "North Dakota" "Ohio" "Oklahoma"

[37] "Oregon" "Pennsylvania" "Rhode Island" "South Carolina" "South Dakota" "Tennessee" "Texas" "Utah" "Vermont"

[46] "Virginia" "Washington" "West Virginia" "Wisconsin" "Wyoming"

> dim(st)

[1] 50 8

> nrow(st)

[1] 50

> ncol(st)

[1] 8

**4.**

> for(i in 1:8){print(sum(st[[i]]))}

[1] 212321

[1] 221790

[1] 58.5

[1] 3543.93

[1] 368.9

[1] 2655.4

[1] 5223

[1] 3536794

> for(i in 1:8){print(mean(st[[i]]))}

[1] 4246.42

[1] 4435.8

[1] 1.17

[1] 70.8786

[1] 7.378

[1] 53.108

[1] 104.46

[1] 70735.88

**5.**

> st$Population

[1] 3615 365 2212 2110 21198 2541 3100 579 8277 4931 868 813 11197 5313 2861 2280 3387 3806 1058 4122 5814 9111 3921 2341 4767 746

[27] 1544 590 812 7333 1144 18076 5441 637 10735 2715 2284 11860 931 2816 681 4173 12237 1203 472 4981 3559 1799 4589 376

**6.**

> st[["Population"]][which(rownames(st)=="Nevada")]

[1] 590

> st[["Income"]][which(rownames(st)=="Nevada")]

[1] 5149

**7.**

> x<-subset(st,st$Area>=100000&st$Frost>=120)

> x

Population Income Illiteracy Life.Exp Murder HS.Grad Frost Area

Alaska 365 6315 1.5 69.31 11.3 66.7 152 566432

Colorado 2541 4884 0.7 72.06 6.8 63.9 166 103766

Montana 746 4347 0.6 70.56 5.0 59.2 155 145587

Nevada 590 5149 0.5 69.03 11.5 65.2 188 109889

New Mexico 1144 3601 2.2 70.32 9.7 55.2 120 121412

**8.**

> x<-subset(st,st$Illiteracy>=2.0)

> mean(x$Income)

[1] 3683.143

**9.**

> abs(mean(x$Income)-mean(y$Income))

[1] 875.1827

**10.**

> x<-subset(st,Income>st[["Income"]][which(rownames(st)=="Pennsylvania")])

> x

Population Income Illiteracy Life.Exp Murder HS.Grad Frost Area

Alaska 365 6315 1.5 69.31 11.3 66.7 152 566432

Arizona 2212 4530 1.8 70.55 7.8 58.1 15 113417

California 21198 5114 1.1 71.71 10.3 62.6 20 156361

Colorado 2541 4884 0.7 72.06 6.8 63.9 166 103766

Connecticut 3100 5348 1.1 72.48 3.1 56.0 139 4862

Delaware 579 4809 0.9 70.06 6.2 54.6 103 1982

Florida 8277 4815 1.3 70.66 10.7 52.6 11 54090

Hawaii 868 4963 1.9 73.60 6.2 61.9 0 6425

Illinois 11197 5107 0.9 70.14 10.3 52.6 127 55748

Indiana 5313 4458 0.7 70.88 7.1 52.9 122 36097

Iowa 2861 4628 0.5 72.56 2.3 59.0 140 55941

Kansas 2280 4669 0.6 72.58 4.5 59.9 114 81787

Maryland 4122 5299 0.9 70.22 8.5 52.3 101 9891

Massachusetts 5814 4755 1.1 71.83 3.3 58.5 103 7826

Michigan 9111 4751 0.9 70.63 11.1 52.8 125 56817

Minnesota 3921 4675 0.6 72.96 2.3 57.6 160 79289

Nebraska 1544 4508 0.6 72.60 2.9 59.3 139 76483

Nevada 590 5149 0.5 69.03 11.5 65.2 188 109889

New Jersey 7333 5237 1.1 70.93 5.2 52.5 115 7521

New York 18076 4903 1.4 70.55 10.9 52.7 82 47831

North Dakota 637 5087 0.8 72.78 1.4 50.3 186 69273

Ohio 10735 4561 0.8 70.82 7.4 53.2 124 40975

Oregon 2284 4660 0.6 72.13 4.2 60.0 44 96184

Rhode Island 931 4558 1.3 71.90 2.4 46.4 127 1049

Virginia 4981 4701 1.4 70.08 9.5 47.8 85 39780

Washington 3559 4864 0.6 71.72 4.3 63.5 32 66570

Wisconsin 4589 4468 0.7 72.48 3.0 54.5 149 54464

Wyoming 376 4566 0.6 70.29 6.9 62.9 173 97203