**CS636 – HomeWork 1**

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#1.20

data("islands")

sort(islands, decreasing=T, na.last = T)[1:7]

##[ Asia Africa North America South America Antarctica Europe Australia

## 16988 11506 9390 6795 5500 3745 2968 ]

#1.21

library(UsingR)

data("primes")

head(primes)

str(primes)

dim(primes)

length(primes) #304

primes[1:100]

primes[primes<=100]

length(primes[1:100])

length(primes[primes<=100]) # 25

length(primes[primes>=100 & primes<=1000]) # 143

#1.22

data("primes")

head(primes)

head(primes[-1]) # 3 5 7 11 13 17 [It won't return 1st element (defined element) of the primes ]

head(primes[-2])

n<- length(primes)

n

primes[-n] #It won't return nth element of the primes

primes[-(n-1)] #It won't return nth-1 element of the primes

primes[-1]-primes[-n]

sum(primes[-1]-primes[-n]==2) #64

#1.23

data("treering")

length(treering) #7980

min(treering) #0

max(treering) #1.908

sum(treering>1.5) #219

#1.24

data("mandms")

mandms

names(mandms)

rowSums(mandms==0)

names(which(rowSums(mandms==0)==1)) #Peanut Butter

rowMeans(mandms)

names(which(rowSums(mandms==rowMeans(mandms))==6)) # Almond , Kid Minis

max(mandms)

names(which(colSums(mandms==30)==1)) # brown

#or

names(which(colSums(mandms==max(mandms))==1))

#or

names(which(rowSums(mandms==max(mandms))==1))

names(which(colSums(mandms==max(mandms))==1))

#1.25

data("nym.2002")

head(nym.2002)

length(nym.2002$time) #1000

fastest\_time<- min(nym.2002$time)

fastest\_time #147.3333

paste(fastest\_time %/% 60, round(fastest\_time %% 60), sep = ":") #2:27

slowest\_time<- max(nym.2002$time)

slowest\_time #566.7833

paste(slowest\_time %/% 60, round(slowest\_time %% 60), sep=":") #9:27

#1.26

data("rivers")

head(rivers)

max(rivers) #3710

min(rivers) #135

#1.27

data("uspop")

uspop

names(uspop)<- seq(1790,1970, by=10)

# [ Time Series:

# Start = 1790

# End = 1970

# Frequency = 0.1

# 1790 1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970

# 3.93 5.31 7.24 9.64 12.90 17.10 23.20 31.40 39.80 50.20 62.90 76.00 92.00 105.70 122.80 131.70 151.30 179.30 203.20 ]

uspop

decade<- diff(uspop)

decade

max(decade) # 1950 to 1960 , greatest increase of 28

uspop

uspop[c(which.max(decade), which.max(decade)+1)]

max(decade)

decade

decade>0 #according to dataset, difference is incresed with each decade.

**Terminal Result:**

> #1.20

> data("islands")

> sort(islands, decreasing=T, na.last = T)[1:7]

Asia Africa North America South America Antarctica Europe Australia

16988 11506 9390 6795 5500 3745 2968

> #1.21

> library(UsingR)

> data("primes")

> head(primes)

[1] 2 3 5 7 11 13

> str(primes)

num [1:304] 2 3 5 7 11 13 17 19 23 29 ...

> dim(primes)

NULL

> length(primes) #304

[1] 304

> primes[1:100]

[1] 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 101 103 107 109 113 127 131 137

[34] 139 149 151 157 163 167 173 179 181 191 193 197 199 211 223 227 229 233 239 241 251 257 263 269 271 277 281 283 293 307 311 313 317

[67] 331 337 347 349 353 359 367 373 379 383 389 397 401 409 419 421 431 433 439 443 449 457 461 463 467 479 487 491 499 503 509 521 523

[100] 541

> primes[primes<=100]

[1] 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97

> length(primes[1:100])

[1] 100

> length(primes[primes<=100]) # 25

[1] 25

> length(primes[primes>=100 & primes<=1000]) # 143

[1] 143

> #1.22

> data("primes")

> head(primes)

[1] 2 3 5 7 11 13

> head(primes[-1]) # 3 5 7 11 13 17 [It won't return 1st element (defined element) of the primes ]

[1] 3 5 7 11 13 17

> head(primes[-2])

[1] 2 5 7 11 13 17

> n<- length(primes)

> n

[1] 304

> primes[-n] #It won't return nth element of the primes

[1] 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 101

[27] 103 107 109 113 127 131 137 139 149 151 157 163 167 173 179 181 191 193 197 199 211 223 227 229 233 239

[53] 241 251 257 263 269 271 277 281 283 293 307 311 313 317 331 337 347 349 353 359 367 373 379 383 389 397

[79] 401 409 419 421 431 433 439 443 449 457 461 463 467 479 487 491 499 503 509 521 523 541 547 557 563 569

[105] 571 577 587 593 599 601 607 613 617 619 631 641 643 647 653 659 661 673 677 683 691 701 709 719 727 733

[131] 739 743 751 757 761 769 773 787 797 809 811 821 823 827 829 839 853 857 859 863 877 881 883 887 907 911

[157] 919 929 937 941 947 953 967 971 977 983 991 997 1009 1013 1019 1021 1031 1033 1039 1049 1051 1061 1063 1069 1087 1091

[183] 1093 1097 1103 1109 1117 1123 1129 1151 1153 1163 1171 1181 1187 1193 1201 1213 1217 1223 1229 1231 1237 1249 1259 1277 1279 1283

[209] 1289 1291 1297 1301 1303 1307 1319 1321 1327 1361 1367 1373 1381 1399 1409 1423 1427 1429 1433 1439 1447 1451 1453 1459 1471 1481

[235] 1483 1487 1489 1493 1499 1511 1523 1531 1543 1549 1553 1559 1567 1571 1579 1583 1597 1601 1607 1609 1613 1619 1621 1627 1637 1657

[261] 1663 1667 1669 1693 1697 1699 1709 1721 1723 1733 1741 1747 1753 1759 1777 1783 1787 1789 1801 1811 1823 1831 1847 1861 1867 1871

[287] 1873 1877 1879 1889 1901 1907 1913 1931 1933 1949 1951 1973 1979 1987 1993 1997 1999

> primes[-(n-1)] #It won't return nth-1 element of the primes

[1] 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97 101

[27] 103 107 109 113 127 131 137 139 149 151 157 163 167 173 179 181 191 193 197 199 211 223 227 229 233 239

[53] 241 251 257 263 269 271 277 281 283 293 307 311 313 317 331 337 347 349 353 359 367 373 379 383 389 397

[79] 401 409 419 421 431 433 439 443 449 457 461 463 467 479 487 491 499 503 509 521 523 541 547 557 563 569

[105] 571 577 587 593 599 601 607 613 617 619 631 641 643 647 653 659 661 673 677 683 691 701 709 719 727 733

[131] 739 743 751 757 761 769 773 787 797 809 811 821 823 827 829 839 853 857 859 863 877 881 883 887 907 911

[157] 919 929 937 941 947 953 967 971 977 983 991 997 1009 1013 1019 1021 1031 1033 1039 1049 1051 1061 1063 1069 1087 1091

[183] 1093 1097 1103 1109 1117 1123 1129 1151 1153 1163 1171 1181 1187 1193 1201 1213 1217 1223 1229 1231 1237 1249 1259 1277 1279 1283

[209] 1289 1291 1297 1301 1303 1307 1319 1321 1327 1361 1367 1373 1381 1399 1409 1423 1427 1429 1433 1439 1447 1451 1453 1459 1471 1481

[235] 1483 1487 1489 1493 1499 1511 1523 1531 1543 1549 1553 1559 1567 1571 1579 1583 1597 1601 1607 1609 1613 1619 1621 1627 1637 1657

[261] 1663 1667 1669 1693 1697 1699 1709 1721 1723 1733 1741 1747 1753 1759 1777 1783 1787 1789 1801 1811 1823 1831 1847 1861 1867 1871

[287] 1873 1877 1879 1889 1901 1907 1913 1931 1933 1949 1951 1973 1979 1987 1993 1997 2003

> primes[-1]-primes[-n]

[1] 1 2 2 4 2 4 2 4 6 2 6 4 2 4 6 6 2 6 4 2 6 4 6 8 4 2 4 2 4 14 4 6 2 10 2 6 6 4 6 6 2 10 2 4

[45] 2 12 12 4 2 4 6 2 10 6 6 6 2 6 4 2 10 14 4 2 4 14 6 10 2 4 6 8 6 6 4 6 8 4 8 10 2 10 2 6 4 6 8 4

[89] 2 4 12 8 4 8 4 6 12 2 18 6 10 6 6 2 6 10 6 6 2 6 6 4 2 12 10 2 4 6 6 2 12 4 6 8 10 8 10 8 6 6 4 8

[133] 6 4 8 4 14 10 12 2 10 2 4 2 10 14 4 2 4 14 4 2 4 20 4 8 10 8 4 6 6 14 4 6 6 8 6 12 4 6 2 10 2 6 10 2

[177] 10 2 6 18 4 2 4 6 6 8 6 6 22 2 10 8 10 6 6 8 12 4 6 6 2 6 12 10 18 2 4 6 2 6 4 2 4 12 2 6 34 6 6 8

[221] 18 10 14 4 2 4 6 8 4 2 6 12 10 2 4 2 4 6 12 12 8 12 6 4 6 8 4 8 4 14 4 6 2 4 6 2 6 10 20 6 4 2 24 4

[265] 2 10 12 2 10 8 6 6 6 18 6 4 2 12 10 12 8 16 14 6 4 2 4 2 10 12 6 6 18 2 16 2 22 6 8 6 4 2 4

> sum(primes[-1]-primes[-n]==2) #64

[1] 61

> #1.23

> data("treering")

> length(treering) #7980

[1] 7980

> min(treering) #0

[1] 0

> max(treering) #1.908

[1] 1.908

> sum(treering>1.5) #219

[1] 219

> #1.24

> data("mandms")

> mandms

blue brown green orange red yellow

milk chocolate 10.0000 30.0000 10.0000 10.0000 20.0000 20.0000

Peanut 20.0000 20.0000 10.0000 10.0000 20.0000 20.0000

Peanut Butter 20.0000 20.0000 20.0000 0.0000 20.0000 20.0000

Almond 16.6667 16.6667 16.6667 16.6667 16.6667 16.6667

kid minis 16.6667 16.6667 16.6667 16.6667 16.6667 16.6667

> names(mandms)

[1] "blue" "brown" "green" "orange" "red" "yellow"

> rowSums(mandms==0)

milk chocolate Peanut Peanut Butter Almond kid minis

0 0 1 0 0

> names(which(rowSums(mandms==0)==1)) #Peanut Butter

[1] "Peanut Butter"

> rowMeans(mandms)

milk chocolate Peanut Peanut Butter Almond kid minis

16.66667 16.66667 16.66667 16.66670 16.66670

> names(which(rowSums(mandms==rowMeans(mandms))==6)) # Almond , Kid Minis

[1] "Almond" "kid minis"

> max(mandms)

[1] 30

> names(which(colSums(mandms==30)==1)) # brown

[1] "brown"

> #or

> names(which(colSums(mandms==max(mandms))==1))

[1] "brown"

> #or

> names(which(rowSums(mandms==max(mandms))==1))

[1] "milk chocolate"

> names(which(colSums(mandms==max(mandms))==1))

[1] "brown"

> #1.25

> data("nym.2002")

> head(nym.2002)

place gender age home time

3475 3592 Male 52 GBR 217.4833

13594 13853 Female 40 NY 272.5500

12012 12256 Male 31 FRA 265.2833

10236 10457 Female 33 MI 256.1500

9476 9686 Male 33 NY 252.2500

1720 1784 Male 40 NJ 201.9667

> length(nym.2002$time) #1000

[1] 1000

> fastest\_time<- min(nym.2002$time)

> fastest\_time #147.3333

[1] 147.3333

> paste(fastest\_time %/% 60, round(fastest\_time %% 60), sep = ":") #2:27

[1] "2:27"

> slowest\_time<- max(nym.2002$time)

> slowest\_time #566.7833

[1] 566.7833

> paste(slowest\_time %/% 60, round(slowest\_time %% 60), sep=":") #9:27

[1] "9:27"

> #1.26

> data("rivers")

> head(rivers)

[1] 735 320 325 392 524 450

> max(rivers) #3710

[1] 3710

> min(rivers) #135

[1] 135

> #1.27

> data("uspop")

> uspop

Time Series:

Start = 1790

End = 1970

Frequency = 0.1

[1] 3.93 5.31 7.24 9.64 12.90 17.10 23.20 31.40 39.80 50.20 62.90 76.00 92.00 105.70 122.80 131.70 151.30 179.30 203.20

> names(uspop)<- seq(1790,1970, by=10)

> uspop

Time Series:

Start = 1790

End = 1970

Frequency = 0.1

1790 1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970

3.93 5.31 7.24 9.64 12.90 17.10 23.20 31.40 39.80 50.20 62.90 76.00 92.00 105.70 122.80 131.70 151.30 179.30 203.20

> decade<- diff(uspop)

> decade

Time Series:

Start = 1800

End = 1970

Frequency = 0.1

[1] 1.38 1.93 2.40 3.26 4.20 6.10 8.20 8.40 10.40 12.70 13.10 16.00 13.70 17.10 8.90 19.60 28.00 23.90

> max(decade) # 1950 to 1960 , greatest increase of 28

[1] 28

> uspop

Time Series:

Start = 1790

End = 1970

Frequency = 0.1

1790 1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970

3.93 5.31 7.24 9.64 12.90 17.10 23.20 31.40 39.80 50.20 62.90 76.00 92.00 105.70 122.80 131.70 151.30 179.30 203.20

> uspop[c(which.max(decade), which.max(decade)+1)]

1950 1960

151.3 179.3

> max(decade)

[1] 28

> decade

Time Series:

Start = 1800

End = 1970

Frequency = 0.1

[1] 1.38 1.93 2.40 3.26 4.20 6.10 8.20 8.40 10.40 12.70 13.10 16.00 13.70 17.10 8.90 19.60 28.00 23.90

> decade>0 #according to dataset, difference is incresed with each decade.

Time Series:

Start = 1800

End = 1970

Frequency = 0.1

[1] TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE

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