#### HW4 ####

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**#### Question 1 ####**

a <- rnorm(20,6,2)

a\_mid <- a[a >= 4 & a <= 7]

a\_mid

[1] 4.895293 5.008926 4.705575 4.208325 6.914284 6.744934 6.413109 4.489685

[9] 5.760855 4.169488

which(a >= 4 & a <= 7)

[1] 2 6 7 8 11 16 17 18 19 20

a\_end <- a[a <3 | a >9]

a\_end

[1] 2.184264 2.065460 9.322380 2.775201 9.376987

**#### Question 2 ####**

income <- rchisq(1000, 8)

middle\_income <- quantile(income, c(0.4,0.6))

middle\_income

40% 60%

6.398512 8.322027

which(income > middle\_income[1] & income < middle\_income[2])

[1] 11 14 17 22 26 27 28 37 45 47 50 55 63 69 71 81 92 97 100

[20] 104 107 116 120 129 133 134 147 149 151 155 162 164 176 180 182 183 186 188

[39] 190 197 198 200 202 204 208 210 214 216 218 222 231 237 238 241 256 269 273

[58] 276 288 295 301 312 314 320 324 329 332 333 334 338 339 343 346 348 358 359

[77] 370 372 374 375 382 404 407 424 426 430 434 436 441 449 455 461 462 463 474

[96] 476 479 484 486 489 493 497 500 504 510 511 513 523 527 531 544 545 548 552

[115] 554 559 562 567 568 572 580 583 589 590 591 601 603 604 607 610 611 626 629

[134] 631 635 639 645 649 653 668 672 674 678 685 693 698 699 702 703 706 710 727

[153] 729 731 742 744 751 762 763 766 774 776 779 780 785 806 819 825 827 841 843

[172] 852 853 861 863 870 877 886 893 900 902 905 918 926 929 936 944 947 949 950

[191] 957 958 961 968 970 971 978 988 994 996

**#### Question 3 ####**

state.name

state.name[(state.name >= "F" & state.name <= "V")]

[1] "Florida" "Georgia" "Hawaii" "Idaho"

[5] "Illinois" "Indiana" "Iowa" "Kansas"

[9] "Kentucky" "Louisiana" "Maine" "Maryland"

[13] "Massachusetts" "Michigan" "Minnesota" "Mississippi"

[17] "Missouri" "Montana" "Nebraska" "Nevada"

[21] "New Hampshire" "New Jersey" "New Mexico" "New York"

[25] "North Carolina" "North Dakota" "Ohio" "Oklahoma"

[29] "Oregon" "Pennsylvania" "Rhode Island" "South Carolina"

[33] "South Dakota" "Tennessee" "Texas" "Utah"

**#### Question 4 ####**

# Create two vectors: poker\_vector and roulette\_vector

poker\_vector <- c(140, -50, 20, -120, 240)

roulette\_vector <- c(-24, -50, 100, 350, 10)

# Assign days as names of poker\_vectors and roulette\_vector

days\_vector <- c("Mon","Tues","Wed","Thu","Fri")

# Which days did you make money on poker and how much did you make on those days

selection\_vector <- days\_vector[poker\_vector > 0]

poker\_winning\_days <- sum(poker\_vector[which(poker\_vector > 0)])

[1] "Mon" "Wed" "Fri"

[1] 400

# Select the days that you made money both in poker and in roulette

# Calculate how much you made on those days.

winning\_days <- days\_vector[poker\_vector > 0 & roulette\_vector > 0]

total <- poker\_vector + roulette\_vector

total\_winning\_days<- sum(total[which(poker\_vector > 0 & roulette\_vector > 0)])

[1] "Wed" "Fri"

[1] 116 -100 120 230 250

[1] 370

# Count the number of days that you won in poker or in roulette

sum(poker\_vector > 0 | roulette\_vector >0)

[1] 4

**#### Question 5 ####**

# Generate a (1000 x 1) vector of standard normal random variables.

# See whether each element is > 1.96 or < -1.96.

# Count this number and calculate the proportioan of this number to 1000.

a <- rnorm(1000)

sum(a > 1.96 | a < -1.96) /1000

[1] 0.054