Stat474W/574 Act 1

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# Objectives

* Write numeric and character data vector in R
* Do simple comparison of numbers in the data vector

# Functions utilized

* c()
* length
* x[i]
* scan()
* sum()
* mean()
* min()
* max()
* which()
* prod()
* choose()
* factorial()

**Act 1.1**

The data below refers to the girth of sample of trees, measured in inches.

10.8, 17.3, 11.2, 11.0, 16.3

1. Write those data values as a vector girth
2. Determine the size of the sample.

girth=c(10.8, 17.3, 11.2, 11.0, 16.3)  
length(girth)

[1] 5

**Act 1.2**

The data below refers to the volume of timber in cubic ft of a sample of 10 trees.

19.9 24.9 10.2 21.4 55.4 36.3 18.8 27.4 42.6 22.6

1. Write those data values as a vector volume.
2. What is the volume of timber of the 7th tree in the sample?
3. How many trees have volume of timer greater than the 7th tree in the sample?
4. Compute the total volume of timber of trees in the sample.
5. Compute the mean volume of timber of trees in the sample.
6. Compute the min volume of timber of trees in the sample.
7. Compute the max volume of timber of trees in the sample.
8. Which tree in the sample has the maximum value of timber?

#(a)  
volume<-scan(text="19.9 24.9 10.2 21.4 55.4 36.3 18.8 27.4 42.6 22.6")  
#(b)  
volume[7]

[1] 18.8

#(c)  
sum(volume>volume[7])

[1] 8

#(d)  
sum(volume)

[1] 279.5

#(e)  
mean(volume)

[1] 27.95

#(f)  
min(volume)

[1] 10.2

#(g)  
max(volume)

[1] 55.4

#(h)  
which(volume==max(volume))

[1] 5

**Act 1.3**

Write a sequence of number starting 1, ending at 17, with step of 3. Find the product of the sequence of the numbers.

x=seq(1,17,3)  
x

[1] 1 4 7 10 13 16

prod(x)

[1] 58240

**Act 1.4**

Note that and therefore, .

Evaluate the value of .

choose(10,5)

[1] 252

factorial(10)/(factorial(5)\* factorial(10-5))

[1] 252

**Problem 1**

Below is a vector that represents how many credit hours each of 10 students are taking in a given semester. credit=c(4,12,15,15,9,15,9,12,10, 12)

* 1. How many credit hour does fifth student take?
  2. How many credit hour do the 3rd and 9th students take?
  3. Which students are taking 12 credit hours?
  4. How many students take 9 hour?
  5. What is the minimum hour a student take?
  6. How many students take the maximum hour?

**Problem 2**

There are a number of ways to represent means in statistics. Of them, three types of means are useful in basic statistical analysis. They are arithmetic mean (AM), geometric mean (GM) and harmonic mean (HM).

Given a set of data values sample of size , the sample arithmatic mean, geometric mean and harmonic mean are defined, respectively, as follows

Define a vector x with odd numbers between 1 and 50, and perform the following computations.

1. Compute AM, GM and HM.
2. Set up an existing relationship between AM, GM and HM on the basis of your results in (a).

Note that you are allowed to use only **seq()**,**sum()** and **prod()** functions, along with other operations, for computations in problem 2.