

IST 687

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Homework 1

Assignment Due: 7/12/2021

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Resubmitting to format properly.

Define the following vectors, which represent the weight and height of people on a particular team (in inches and pounds):

```
height <- c(59,60,61,58,67,72,70)
weight <- c(150,140,180,220,160,140,130)
```

Define a variable:

```
a <- 150
```

Step 1: Calculating means

1) Compute, using R, the average height (called mean in R)

```
averageHeight<-mean(height)
averageHeight
```

```
## [1] 63.85714
```

2) Compute, using R, the average weight (called mean in R)

```
averageWeight<-mean(weight)
averageWeight
```

```
## [1] 160
```

3) Calculate the length of the vector 'height' and 'weight'

```
heightQuantity<-length(height)
weightQuantity<-length (weight)
heightQuantity
```

```
## [1] 7
```

```
weightQuantity
```

```
## [1] 7
```

4) Calculate the sum of the heights

```
heightSum<-sum(height)
heightSum
```

```
## [1] 447
```

5) Compute the average of both height and weight, by dividing the sum (of the height or the width, as appropriate), by the length of the vector. How does this compare to the ‘mean’ function?

```
computeHeightAverage<-(sum(height)/length(height))
computeWeightAverage<-(sum(weight)/length(weight))
computeHeightAverage
```

```
## [1] 63.85714
```

```
computeWeightAverage
```

```
## [1] 160
```

The computed mean above differs in that it only will return the mean no matter if there are missing or null values within the vector. Utilizing the man function allows a user to add parameters which allow for the dropping of some observations from both ends of the vector along with removing missing values from the input vector.

Step 2: Using max/min functions

6) Compute the max height, store the result in ‘maxH’

```
maxH<-max(height)
maxH
```

```
## [1] 72
```

7) Compute the min weight, store the results in ‘minW’

```
minW<-min(weight)
minW
```

```
## [1] 130
```

Step 3: Vector Math

8) Create a new vector, which is the weight + 5 (every person gained 5 pounds)

```
newWeight<-weight+5
newWeight
```

```
## [1] 155 145 185 225 165 145 135
```

9) Compute the weight/height for each person, using the new weight just created

```
newWeightHeight<-vector()

for(i in 1:length(newWeight)){
  tempRatio<-(newWeight[i]/height[i])
  newWeightHeight[i]<-tempRatio
}

newWeightHeight
```

```
## [1] 2.627119 2.416667 3.032787 3.879310 2.462687 2.013889 1.928571
```

Step 4: Using Conditional if statements

10) Write the R code to test if max height is greater than 60 (output “yes” or “no”)

```
if(maxH > 60){
  print("yes")
}else{
  print("no")
}
```

```
## [1] "yes"
```

11) Write the R code to if min weight is greater than the variable ‘a’ (output “yes” or “no”)

```
if(minW > a){
  print("yes")
}else{
  print("no")
}
```

```
## [1] "no"
```