R Functions (lab 6)

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Functions in R

3 element: name(); arguments(input of function); body

Function

```
# Example input vectors to start with
student1 <- c(100, 100, 100, 100, 100, 100, 100, 90)
student2 <- c(100, NA, 90, 90, 90, 90, 97, 80)
student3 <- c(90, NA, NA, NA, NA, NA, NA, NA)

# calculate average of student1
mean(student1)
```

```
[1] 98.75
```

```
# convert NA to 0
student1[is.na(student1)] <- 0
# position of first lowest score
which.min(student1)
```

```
[1] 8
```

```
# drop lowest score
student1[-which.min(student1)]
```

```
[1] 100 100 100 100 100 100 100
```

```r
# function to calculate mean score after dropping lowest
avg <- function(grade){
  # convert NA to 0
  grade[is.na(grade)] <- 0
  # calculate and print mean score after dropping lowest
  print(mean(grade[-which.min(grade)]))
}
#test
avg(student3)
```

```
[1] 12.85714
```

```r
# import grade book as df
gradebook <- read.csv("https://tinyurl.com/gradeinput", row.names = 1)

# calculate average for all students and homeworks
stu_avg <- apply(gradebook, 1, avg)
```

```
[1] 91.75
[1] 82.5
[1] 84.25
[1] 84.25
[1] 88.25
[1] 89
[1] 94
[1] 93.75
[1] 87.75
[1] 79
[1] 86
[1] 91.75
[1] 92.25
[1] 87.75
[1] 78.75
[1] 89.5
[1] 88
[1] 94.5
[1] 82.75
[1] 82.75
```

```r
hw_avg <- apply(gradebook, 2, avg)
```

```
[1] 89.36842
[1] 76.63158
[1] 81.21053
[1] 89.63158
[1] 83.42105
```

lab 6 assignment

Q2

```r
which.max(stu_avg)
```

```
student-18
        18
```

Student 18 is the highest scoring student

Q3

```r
which.min(hw_avg)
```

```
hw2
  2
```

Homework 2 is the toughest

Q4

```r
grade <- gradebook
grade[is.na(grade)] <- 0
which.max(abs(apply(grade, 2, cor, stu_avg)))
```

```
hw5
  5
```

Homework 5 was most predictive