

# Homework #4

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Due date Dec 15, 2021 00:00 EET

**Q1:(10pts)** Create two functions that calculate *variance* and *standard deviation* of an arbitrary **x** vector. Do not use R's **sd** and **var** functions (remember HW #1).

```
myvar <- function(x) {  
  # Fill here  
}  
  
mysd <- function(x) {  
  # Fill here  
}
```

**Q2:(10pts)** A dependent function chain is defined as  $h(x) = \frac{\log(x)-1}{\sqrt{x}}$ ,  $g(x) = e^{\sqrt{h(x)}}$  and  $f(x) = \sin g(x)^{\cos g(x)}$ . Create functions for each of them and solve **f(x)** for  $x <- 4:250$ .

**Q3:(20pts)** Create a function that calculates number of exceedence of a specified threshold in an arbitrary **x** vector.

```
exceedence <- function(x, threshold) {  
  # Fill here  
}
```

**Q4:(20pts)** Create a function that calculates slopes between points in an arbitrary **x** and **y** vector pairs. Function MUST make sure length of **x** and **y** vectors are equal.

```
slope <- function(x, y) {  
  # Fill here  
}
```

**Q5:(10pts)** Create a function calculates the sum of digits of any integer. For instance, sum of digits of 385102 is  $3 + 8 + 5 + 1 + 2 = 19$ .

```
sumofdig <- function(x) {  
  # Fill here  
}
```

**Q6:(30pts)** By using the function in Q5, create a function calculates count of numbers whose sum of digits is **m** in an integer **x** vector. For instance, there are 2 numbers whose sum of digits is 5 between 10 and 30.

```
numofsumofdig <- function(x, m = 20) {  
  # Fill here  
}
```

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## Notes:

- Please, email your answers privately to **sezenismail** at **gmail** com.

- Answers/codes should be in a text file named `name_surname.r`.
- Do not use **for-loop** statements.
- Write your conclusions as *R comments* in the text file.
- If you didn't understand a question clearly, email your question to [ysb801e@googlegroups.com](mailto:ysb801e@googlegroups.com).