

Homework #4

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Due date Dec 15, 2021 00:00 EET

Q1:(10pts) Create two functions that calculate *variance* and *standart 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  
}
```

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.