

# Lab 1: R Basics

INSERT YOUR NAME HERE (INSERT YOUR UW NETID HERE)

Due by 23:59pm on Jan 16, 2024

## Total Points: 30

To begin, please follow the links in the course syllabus to download R, RStudio, and R Markdown. You should edit this .Rmd using RStudio, then click *Knit* in the menu bar of the source window (above the text of this .Rmd). Remember, you must submit your knitted PDF file through Canvas in order to receive full credit!

## Part 1. Basic R Code (2pts per question)

1. Use R to compute  $1+2*(3+4)$ .

```
# Your code here
```

2. Use R to compute the logarithm of  $18+3*2$  under the natural base **and** base 2.

```
# Your code here (two lines)
```

3. Suppose that a student had his original score as 70. However, he submitted his homework **6 hours and 20 minutes** late for the deadline. Use R to calculate his final score.

```
# Your code here
```

4. Use R build-in function to compute  $6!$  (i.e.,  $6 \times 5 \times 4 \times 3 \times 2 \times 1$ ).

```
# Your code here
```

5. Are the outputs of `round(6.6)` and `as.integer(6.6)` the same?

```
# Your code here (Hint: the output should be TRUE/FALSE)
```

6. Use R function to check whether the data type of 3.2 is `numeric`.

```
# Your code here (output should be TRUE/FALSE)
```

7. What are the data type and the length of “James”?

```
# Your code here (Two lines)
```

8. What is the result of  $0/0$ ? Is it equal to NA?

```
# Your code here (Two lines)
```

## Part 2: Explore build-in R functions (4pts per question)

Look at the documentation of the following R functions `seq`, `factorial`, and `choose`. Use **at least two ways** in R to achieve the followings.

1. Generate the sequence: -0.8, -0.4, 0, 0.4, 0.8, 1.2, 1.6.

```
# Your code here (At least two lines)
```

2. Compute  $\binom{7}{4}$  (this was produced by L<sup>A</sup>T<sub>E</sub>Xcommand `$7 \choose 4$`).

```
# Your code here (At least two lines)
```

### Part 3: Computing Summary Statistics of A Vector Variable (1pt per question)

Run the following command to create an object.

```
## Run it before proceeding to the questions  
x <- c(1, 8, -3.2, 5, -1, 15.3)
```

Use R to do the followings:

1. Compute the length of the object `x`.

```
# Your code here
```

2. Compute the sum of `x`.

```
# Your code here
```

3. Compute the *cumulative* sum of `x`.

```
# Your code here (Hint: the output has the same length as x.)
```

4. Output the index of elements in `x` that is  $>1.5$ . Hint: look at the documentation of `which()`.

```
# Your code here
```

5. Find the minimum value of `x`.

```
# Your code here
```

6. Order the values of the vector `x` from low to high.

```
# Your code here
```