Week 1 Quiz

Total points 20

1. The R language is a dialect of which of the following programming languages? **1 point**

- ○ Lisp
- ○ Fortran
- ◉ S
- ○ Scheme

2. The definition of free software consists of four freedoms (freedoms 0 through 3). Which of the following is NOT one of the freedoms that are part of the definition? Select all that apply. **1 point**

- ☑ The freedom to study how the program works, and adapt it to your needs.
- ☐ The freedom to prevent users from using the software for undesirable purposes.
- ☑ The freedom to improve the program, and release your improvements to the public, so that the whole community benefits.
- ☑ The freedom to run the program, for any purpose.
- ☑ The freedom to sell the software for any price.
- ☐ The freedom to restrict access to the source code for the software.
- ☑ The freedom to redistribute copies so you can help your neighbor.

3. In R the following are all atomic data types EXCEPT: (Select all that apply) **1 point**

- [ ] integer
- [ ] list
- [ ] array
- [x] character
- [ ] matrix
- [ ] data frame
- [x] logical
- [ ] table
- [x] numeric
- [x] complex

4. If I execute the expression x <- 4L in R, what is the class of the object `x' as determined by the `class()' function? **1 point**

- ( ) logical
- (•) integer
- ( ) numeric
- ( ) complex
- ( ) character
- ( ) matrix

5. What is the class of the object defined by the expression x <- c(4, "a", TRUE)? **1 point**

- mixed
- character
- logical
- numeric
- integer

6. If I have two vectors x <- c(1,3, 5) and y <- c(3, 2, 10), what is produced by the expression cbind(x, y)? **1 point**

- a vector of length 2
- a 2 by 3 matrix
- a vector of length 3
- a matrix with 2 columns and 3 rows
- a 3 by 3 matrix
- a 2 by 2 matrix

7. A key property of vectors in R is that **1 point**

- elements of a vector can only be character or numeric
- a vector cannot have have attributes like dimensions

- ○ elements of a vector can be of different classes
- ○ the length of a vector must be less than 32,768
- ◉ elements of a vector all must be of the same class

8. Suppose I have a list defined as x <- list(2, "a", "b", TRUE). What does x[[1]] give me? Select all that apply. **1 point**

- ☐ a numeric vector containing the element 2.
- ☑ a list containing the number 2.
- ☐ a list containing the letter "a".
- ☐ a character vector containing the element "2".
- ☐ a numeric vector of length 1.

9. Suppose I have a vector x <- 1:4 and a vector y <- 2. What is produced by the expression x + y? **1 point**

- ○ an integer vector with elements 3, 2, 3, 6.
- ○ a numeric vector with elements 1, 2, 3, 6.
- ○ an integer vector with elements 3, 2, 3, 4.
- ◉ a numeric vector with elements 3, 4, 5, 6.
- ○ a numeric vector with elements 3, 2, 3, 4.
- ○ a numeric vector with elements 3, 2, 3, 6.

10. Suppose I have a vector x <- c(3, 5, 1, 10, 12, 6) and I want to set all elements of this vector that are less than 6 to be equal to zero. What R code achieves this? Select all that apply. **1 point**

- [x] x[x < 6] <- 0
- [ ] x[x != 6] <- 0
- [x] x[x <= 5] <- 0
- [x] x[x %in% 1:5] <- 0
- [ ] x[x > 0] <- 6
- [ ] x[x > 6] <- 0
- [ ] x[x == 0] < 6
- [ ] x[x >= 6] <- 0
- [ ] x[x < 6] == 0
- [ ] x[x == 6] <- 0
- [ ] x[x == 0] <- 6

11. Use the Week 1 Quiz Data Set to answer questions 11-20. **1 point**

In the dataset provided for this Quiz, what are the column names of the dataset?

- ( ) Ozone, Solar.R, Wind
- ( ) 1, 2, 3, 4, 5, 6
- (•) Ozone, Solar.R, Wind, Temp, Month, Day

- Month, Day, Temp, Wind

12. Extract the first 2 rows of the data frame and print them to the console. What does the output look like? **1 point**

```
  1      Ozone Solar.R Wind Temp Month Day
2 1      9       24 10.9   71     9  14
3 2     18      131  8.0   76     9  29
```

- [x]
```
  1      Ozone Solar.R Wind Temp Month Day
2 1     41      190  7.4   67     5   1
3 2     36      118  8.0   72     5   2
```

```
  1      Ozone Solar.R Wind Temp Month Day
2 1      7       NA  6.9   74     5  11
3 2     35      274 10.3   82     7  17
```

```
  1      Ozone Solar.R Wind Temp Month Day
2 1     18      224 13.8   67     9  17
3 2     NA      258  9.7   81     7  22
```

13. How many observations (i.e. rows) are in this data frame? **1 point**

- 45
- [x] 153
- 129

160

14. Extract the *last* 2 rows of the data frame and print them to the console. What does the output look like? **1 point**

```
   1        Ozone Solar.R Wind Temp Month Day
2    152    31      244 10.9   78     8  19
3    153    29      127  9.7   82     6   7
```

```
   1        Ozone Solar.R Wind Temp Month Day
2    152    34      307 12.0   66     5  17
3    153    13       27 10.3   76     9  18
```

```
   1        Ozone Solar.R Wind Temp Month Day
2    152    11       44  9.7   62     5  20
3    153   108      223  8.0   85     7  25
```

```
   1        Ozone Solar.R Wind Temp Month Day
2    152    18      131  8.0   76     9  29
3    153    20      223 11.5   68     9  30
```

15. What is the value of Ozone in the 47th row? **1 point**

34

63

18

- [x] 21

16. How many missing values are in the Ozone column of this data frame? **1 point**

- [ ] 78
- [ ] 9
- [x] 37
- [ ] 43

17. What is the mean of the Ozone column in this dataset? Exclude missing values (coded as NA) from this calculation. **1 point**

- [ ] 31.5
- [ ] 53.2
- [x] 42.1
- [ ] 18.0

18. Extract the subset of rows of the data frame where Ozone values are above 31 and Temp values are above 90. What is the mean of Solar.R in this subset? **1 point**

- [x] 212.8
- [ ] 205.0
- [ ] 185.9

- ○ 334.0

19. What is the mean of "Temp" when "Month" is equal to 6? **1 point**

- ○ 85.6
- ◉ 79.1
- ○ 90.2
- ○ 75.3

20. What was the maximum ozone value in the month of May (i.e. Month is equal to 5)? **1 point**

- ◉ 115
- ○ 18
- ○ 100
- ○ 97