

Quiz Programming Solutions

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Q4. If I execute the expression `x <- 4` in R, what is the class of the object `x` as determined by the `class()` function?

```
x <- 4
class(x)
```

```
## [1] "numeric"
```

Q5. What is the class of the object defined by the expression `x <- c(4, "a", TRUE)`?

```
x <- c(4, "a", TRUE)
class(x)
```

```
## [1] "character"
```

Q6 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)`?

```
x <- c(1,3, 5)
y <- c(3, 2, 10)
cbind(x, y)
```

```
##      x  y
## [1,] 1  3
## [2,] 3  2
## [3,] 5 10
```

Q8 Suppose I have a list defined as `x <- list(2, "a", "b", TRUE)`. What does `x[[1]]` give me? Select all that apply.

```
x <- list(2, "a", "b", TRUE)
x[[1]]
```

```
## [1] 2
```

Q10 Suppose I have a vector `x <- 1:4` and a vector `y <- 2`. What is produced by the expression `x + y`?

```
x <- 1:4
y <- 2
x + y
```

```
## [1] 3 4 5 6
```

Q10 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.

```
x <- c(3, 5, 1, 10, 12, 6)
(x[x < 6] <- 0)
```

```
## [1] 0
```

```

x

## [1] 0 0 0 10 12 6
y <- c(3, 5, 1, 10, 12, 6)
y[y > 6] <- 0
y

## [1] 3 5 1 0 0 6
z <- c(3, 5, 1, 10, 12, 6)
z[z < 6] == 0

## [1] FALSE FALSE FALSE
z

## [1] 3 5 1 10 12 6
a <- c(3, 5, 1, 10, 12, 6)
a[a > 0] <- 6
a

## [1] 6 6 6 6 6 6
b <- c(3, 5, 1, 10, 12, 6)
b[b <= 5] <- 0
b

## [1] 0 0 0 10 12 6
d <- c(3, 5, 1, 10, 12, 6)
d[d == 0] <- 6
d

## [1] 3 5 1 10 12 6
e <- c(3, 5, 1, 10, 12, 6)
e[e %in% 1:5] <- 0
e

## [1] 0 0 0 10 12 6
f <- c(3, 5, 1, 10, 12, 6)
f[f == 6] <- 0
f

## [1] 3 5 1 10 12 0
g <- c(3, 5, 1, 10, 12, 6)
g[g == 0] < 6

## logical(0)
g

## [1] 3 5 1 10 12 6
h <- c(3, 5, 1, 10, 12, 6)
h[h != 6] <- 0
h

## [1] 0 0 0 0 0 6

```

```
i <- c(3, 5, 1, 10, 12, 6)
i[i >= 6] <- 0
i
```

```
## [1] 3 5 1 0 0 0
```

Q11 Use the Week 1 Quiz Data Set to answer questions 11-20.

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

```
hw_data <- read.csv("./data/hw1_data.csv")
names(hw_data)
```

```
## [1] "Ozone" "Solar.R" "Wind" "Temp" "Month" "Day"
```

Q12 Extract the first 2 rows of the data frame and print them to the console. What does the output look like?

```
head(hw_data, 2)
```

```
##   Ozone Solar.R Wind Temp Month Day
## 1    41     190  7.4   67     5    1
## 2    36     118  8.0   72     5    2
```

Q13 How many observations (i.e. rows) are in this data frame?

```
nrow(hw_data)
```

```
## [1] 153
```

Q13 Extract the **last** 2 rows of the data frame and print them to the console. What does the output look like?

```
tail(hw_data, 2)
```

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

Q15 What is the value of Ozone in the 47th row?

```
hw_data <- data.frame(hw_data)
hw_data[47,1]
```

```
## [1] 21
```

Q16 How many missing values are in the Ozone column of this data frame?

```
sum(is.na(hw_data[1]))
```

```
## [1] 37
```

Q17 What is the mean of the Ozone column in this dataset? Exclude missing values (coded as NA) from this calculation.

```
ozone <- hw_data[1]
clean_ozone <- !is.na(ozone)
mean(ozone[clean_ozone])
```

```
## [1] 42.12931
```

Q18 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?

```
sub = subset(hw_data, Ozone > 31 & Temp > 90, select = Solar.R)
apply(sub, 2, mean)
```

```
## Solar.R
## 212.8
```

Q19 What is the mean of “Temp” when “Month” is equal to 6?

```
sub = subset(hw_data, Month == 6, select = Temp)
apply(sub, 2, mean)
```

```
## Temp
## 79.1
```

Q20 What was the maximum ozone value in the month of May (i.e. Month is equal to 5)?

```
sub = subset(hw_data, Month == 5 & !is.na(Ozone), select = Ozone)
apply(sub, 2, max)
```

```
## Ozone
## 115
```