

Week 1 Exercises

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Please complete all exercises below **WITHOUT** using any libraries/packages.

Exercise 1

Assign 10 to the variable x. Assign 5 to the variable y. Assign 20 to the variable z.

```
#your code below
# Define variables
x <- 10
y <- 5
z <- 15
```

Exercise 2

Show that x is less than z but greater than y.

Note: your output must be a SINGLE Boolean, do not output a Boolean for each expression.

```
#your code below
# Check if x is less than z and greater than y
output <- x < z & x > y

# Print output
print(output)

## [1] TRUE
```

Exercise 3

Show that x and y do not equal z.

Note: your output must be a SINGLE Boolean, do not output a Boolean for each expression.

```
#your code here
# Check if x and y do not equal z
output <- x != z & y != z
```

```
# Print output
print(output)

## [1] TRUE
```

Exercise 4

Show that the formula $x + 2y = z$. **Note: your output must be a SINGLE Boolean**

```
#your code below
# Check if  $x + 2y = z$ 
output <- x + 2*y == z

# Print output
print(output)

## [1] FALSE
```

Exercise 5

I have created a vector (test_vector) of integers for you. Determine if any of x, y, or z are in the vector. **Note: your output must be a SINGLE Boolean, do not output a Boolean for each expression.**

```
test_vector <- c(1,5,11:22)
#your code below
# Check if any of x, y, or z are in the vector
output <- x %in% test_vector | y %in% test_vector | z %in% test_vector

# Print output
print(output)

## [1] TRUE
```

Exercise 6

Show which value is contained in the test vector. To do this you will need to create an element-wise logical vector using operators. $x == \text{vector}$. Once you have done that you will need to use slicing to return all indices that have matches. **Note: your output should be two integers**

```
#your code below
# Find indices of matching values
matches <- which(x == test_vector | y == test_vector | z == test_vector)

# Print matches
print(matches)

## [1] 2 7
```