01-exercises

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Exercise 1:

Write a function (f) that takes a vector of numbers, **x**, and returns a vector of numbers such that each element containing the product of every element of x except the element of x with the same index.

Example

```
> x <- c( 1, 5, 2, 8 )
> f(x)
[1] 80 16 40 10
# 5*2*8, 1*2*8, 1*5*8, 1*2*5
```

Solution

```
x <- c( 1, 5, 2, 8)
y <- c( 1, 5, 2, 0)

f <- function(x){
  ifelse(x!=0,prod(x)/x,prod(subset(x,x!=0)))
}

f(x)
```

```
## [1] 80 16 40 10
```

```
f(y)
```

```
## [1]  0  0  0 10
```

Exercise 2

Write a function f(x) to accept an integer vector, and returns a vector with those numbers except for: multiples of 3 replaced by “Fizz”? multiples of 5 replaced by “Buzz” multiples of 3 and 5 replaced by “FizzBuzz”"

Example

```
> x <- 1:20
> f(1:20)
# 1 2 Fizz 4 Buzz Fizz 7 8 Fizz Buzz 11 Fizz 13 14 FizzBuzz 16 17 Fizz 19 Buzz
```

Solution

```r
x <- 1:20
######## Method 1
f <- function(x) {
  x[as.numeric(x)%%3==0 & as.numeric(x)%%5==0] <- "FizzBuzz"
  x[as.numeric(x)%%3==0] <- "Fizz"
  x[as.numeric(x)%%5==0] <- "Buzz"
  x
}

###### Method 2
f2 <- function(x){
  y <- c()
  for (i in 1:length(x)){
    if ( (i%%3==0) & (i%%5==0) ) {y <- append(y,"FizzBuzz") }
    else if (i%%3==0) {y <- append(y,"Fizz") }
    else if (i%%5==0) {y <- append(y,"Buzz") }
    else {y <- append(y,i) }
  }
  y
}


#### Testing
f(x)
```

```
## Warning in x[as.numeric(x)%%3 == 0] <- "Fizz": NAs introduced by coercion
```

```
## Warning in x[as.numeric(x)%%5 == 0] <- "Buzz": NAs introduced by coercion
```

```
##  [1] "1"        "2"        "Fizz"     "4"        "Buzz"     "Fizz"
##  [7] "7"        "8"        "Fizz"     "Buzz"     "11"       "Fizz"
## [13] "13"       "14"       "FizzBuzz" "16"       "17"       "Fizz"
## [19] "19"       "Buzz"
```

```r
f2(x)
```

```
##  [1] "1"        "2"        "Fizz"     "4"        "Buzz"     "Fizz"
##  [7] "7"        "8"        "Fizz"     "Buzz"     "11"       "Fizz"
## [13] "13"       "14"       "FizzBuzz" "16"       "17"       "Fizz"
## [19] "19"       "Buzz"
```

```r
all.equal(f(x), f2(x))
```

```
## Warning in x[as.numeric(x)%%3 == 0] <- "Fizz": NAs introduced by coercion
```

```
## Warning in x[as.numeric(x)%%3 == 0] <- "Fizz": NAs introduced by coercion
```

```
## [1] TRUE
```