HW

AUTHOR
Brandon Keck

Exercise 1

```
sum_squares <- function(x) {
  sum <- 0

  for (i in 1:x) {
    sum <- sum + i^2
  }

  return(sum)
}

sum_5 <- sum_squares(5)
sum_10 <- sum_squares(10)
sum_50 <- sum_squares(50)

print(paste("The sum of squares up to 5 is", sum_5))
```

```
[1] "The sum of squares up to 5 is 55"
```

```
print(paste("The sum of squares up to 10 is", sum_10))
```

```
[1] "The sum of squares up to 10 is 385"
```

```
print(paste("The sum of squares up to 50 is", sum_50))
```

```
[1] "The sum of squares up to 50 is 42925"
```

Exercise 2

(a)

```
head(airquality)
```

```
  Ozone Solar.R Wind Temp Month Day
1    41     190  7.4   67     5   1
2    36     118  8.0   72     5   2
3    12     149 12.6   74     5   3
4    18     313 11.5   62     5   4
5    NA      NA 14.3   56     5   5
6    28      NA 14.9   66     5   6
```

```
dframe1 <- c()

for (i in 1:ncol(airquality)) {

  dframe1[i] <- sum(is.na(airquality[, i]))
}

names(dframe1) <- colnames(airquality)

dframe1
```

```
  Ozone Solar.R    Wind    Temp   Month     Day
     37       7       0       0       0       0
```

(b)

```
dframe1 <- apply(airquality, MARGIN = 2, FUN = function(x) sum(is.na(x)))

dframe1
```

```
  Ozone Solar.R    Wind    Temp   Month     Day
     37       7       0       0       0       0
```

Exercise 3

```
set.seed(200)
n <- 10000
count_sevens <- 0

for (i in 1:n) {
  dice <- sample(1:6, size = 2, replace = TRUE)
  if (sum(dice) == 7) {
    count_sevens <- count_sevens + 1
  }
}

count_sevens / n
```

```
[1] 0.165
```

Exercise 4

```
library(mosaicData)
```

Wage Confidence Interval

```
compute_ci <- function(b, cl = 0.95, na_rm = FALSE) {
  if (na_rm) {
    b <- na.omit(b)
  }

  n <- length(b)
  mean_b <- mean(b)
  sd_b <- sd(b)


  t_value <- abs(qt((1 - cl) / 2, df = n - 1)) #computes the critical value for a s

  me <- t_value * (sd_b / sqrt(n))

  lower <- mean_b - me
  upper <- mean_b + me

  return(c(lower, upper))
}


compute_ci(CPS85$wage) # uses default cl = 0.95
```

```
[1] 8.587194 9.460933
```

Wage Confidence Interval when cl = 0.8

```
compute_ci(CPS85$wage, cl = 0.8)
```

```
[1] 8.738705 9.309422
```

Ozone Confidence Interval

```
compute_ci(airquality$Ozone, cl = 0.90, na_rm = TRUE) # Ozone column has NA values
```

```
[1] 37.05046 47.20816
```