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# R intro exercise

setwd("workshop_materials/R_tutorial/")

# Use R as calculator
(4+5)^2
sin(3.14)

# Set variables
x <- 13.4
x = 13.4

y <- c(1,2,3,4,5)
y

y <- 1:5
y

z <- rep(2,10)
z

# Logical operations
8 > 7
7 > 8

# Statistics
t.test(12:34, 5:32)
help(t.test)
?t.test
t.test(12:34, 5:32,
     alternative = "greater")

# Vector manipulation
n <- c(3,7,12,50,103)
n
n[4]
n[1:3]
n[c(1,3,5)]
n[n < 50]
n[n > 8 & n != 50]

n
n+1
sum(n)
mean(n)
```

```
var(n)
min(n)
max(n)

getwd()
setwd()

healthy <- read.table("healthy_metadata.txt")
healthy
class(healthy)
nrow(healthy)
ncol(healthy)
dim(healthy)

sick <- read.table("sick_metadata.txt")

# Data frame manipulations
head(healthy)
tail(healthy)
head(healthy, 10)
healthy[1:10,]
healthy[1:10,3]
healthy[,3]
healthy[5,3]
healthy[-1,]

# Histogram plots
hist(healthy$Age)
?hist
hist(healthy$Age, breaks = c(3:22))
summary(healthy$Age)

# Box plots
sick$Age
boxplot(sick$Age)
boxplot(sick$Age, healthy$Age,
      ylab="Age",
      xlab="Health status",
      names=c("Sick","Healthy"))

# t-test Age Sick vs Healthy
t.test(sick$Age, healthy$Age)

boxplot(sick$Age, healthy$Age,
      ylab="Age",
```

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      xlab="Health status",
      names=c("Sick","Healthy"),
      col=c("mistyrose","lightblue"),
      main="Boxplot")

# Save data frames
healthy_over10 <- healthy[healthy$Age > 10,]

getwd()
write.table(healthy_over10,
        "healthy_over10.txt",
        quote=F, sep="\t")

list.files()
```