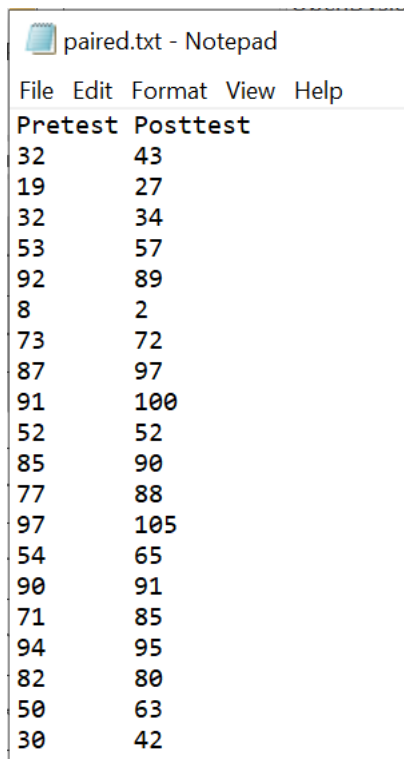


R is a very flexible tool and there are a lot of ways to accomplish the same thing. What I am showing you here is just one way to do each test while using R as little as possible. If you aren't confident with R, you can follow the method here exactly (manipulating your data outside of R to get it into the format shown here). If you are confident with R, you can easily find many other ways to accomplish these same things.

These are extremely simple and aren't taking advantage of many of the capabilities of R; I am just providing these examples so you can use them in this class if you need to run t-tests for your activities. I don't recommend using these examples directly beyond this class if you don't understand the code. In general, I do not recommend using any code you don't understand. If you want to use R in your actual research, make sure you take the time to learn it (the "Programming" module in this subject will be a good start), rather than just copying code that you don't fully understand.

## **Paired samples t-test**

Save your data in a tab-delimited text file in two columns with labels at the top, which will look something like this:



| Pretest | Posttest |
|---------|----------|
| 32      | 43       |
| 19      | 27       |
| 32      | 34       |
| 53      | 57       |
| 92      | 89       |
| 8       | 2        |
| 73      | 72       |
| 87      | 97       |
| 91      | 100      |
| 52      | 52       |
| 85      | 90       |
| 77      | 88       |
| 97      | 105      |
| 54      | 65       |
| 90      | 91       |
| 71      | 85       |
| 94      | 95       |
| 82      | 80       |
| 50      | 63       |
| 30      | 42       |

Open R, and import your data using the following command (you will have to manually navigate to the location where the file is saved):

```
mydata <- read.table( file=file.choose(), header=T, sep="\t" )
```

(the `file=file.choose()` parameter causes R to open a graphical interface where you choose your file; the `header=T` parameter tells R that the first row of your data file is a "header" consisting of labels for the two conditions; and the `sep="\t"` parameter says that the numbers in your text file are separated by tabs).

After that's done, run the t-test using the following command (replacing "Pretest" and "Posttest" with whatever condition labels you used):

```
t.test( mydata$Posttest, mydata$Pretest, paired=T )
```

(the `paired=T` parameter tells R to do a paired test instead of an independent test. This is, by default, a two-tailed test; if you are good enough at stats to be ready for a one-tailed test, you can further explore the R help pages [`?t.test`] or other tutorials online to see how to specify a one-tailed test.)

## One-sample t-test

Remember what I said in a previous activity in this module: a paired samples t-test is actually a one-sample t-test.

If you want to explicitly run this as a one-sample t-test, just manually calculate the posttest-pretest difference (using Excel or something like that) for each person, and save the differences in a new file. It will look something like this:

```
onesample.txt - Notepad
File Edit Format View Help
Difference
11
8
2
4
-3
-6
-1
10
9
0
5
11
8
11
1
14
1
-2
13
12
```

Load your file in R the same way as before:

```
mydata <- read.table( file=file.choose(), header=T )
```

After that's done, run the t-test using the following simple command:

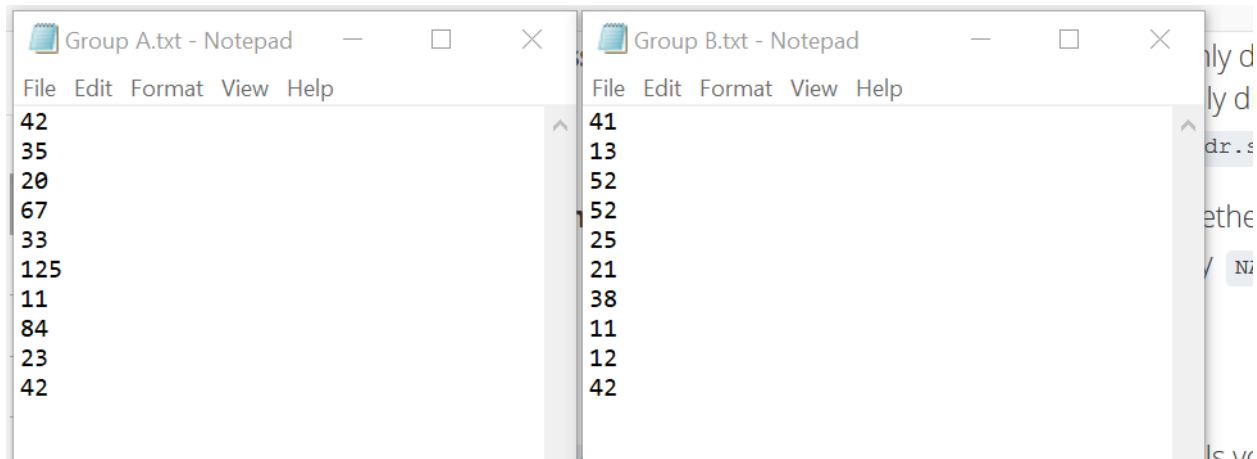
```
t.test( mydata$Difference )
```

The result you see should be exactly identical to what you got with the paired samples t-test.

## Independent samples t-test

For this one, save your data in two different files. (Like I said before, there are a lot of different ways to do this; the way I'm

describing here is just one that requires minimal understanding of R.)  
No need to include a header here. They will look something like  
this:



Import each file into R with a separate name (note that I'm  
specifying here there will not be any header in the file):

```
GroupA <- read.table( file=file.choose(), header=F )  
GroupB <- read.table( file=file.choose(), header=F )
```

After that's done, run the t-test using the following command:

```
t.test( GroupA$V1, GroupB$V1, paired=F )
```

Here I specify `paired=F` to tell R this is *not* a paired test. By  
default, R will do an unequal-variances test.