* 1. Independent two sample t-test

Hypothesis

H0: µA=µB

H1: µA≠µB

**> drugs<-read.table(file.choose(),header=T)**

**> attach(drugs)**

**> drugs**

Drug\_A Drug\_B

1 2.0 3.5

2 3.6 5.7

3 2.6 2.9

4 2.6 2.4

5 7.3 9.9

6 3.4 3.3

7 14.9 16.7

8 6.6 6.0

9 2.3 3.8

10 2.0 4.0

11 6.8 9.1

12 8.5 20.9

To check normality

H0: Data are normally distributed

H1: Data are not normally distributed

**> shapiro.test(Drug\_A)**

Shapiro-Wilk normality test

data: Drug\_A

W = 0.80718, p-value = 0.01132

**> shapiro.test(Drug\_B)**

Shapiro-Wilk normality test

data: Drug\_B

W = 0.7883, p-value = 0.006919

As p-value is not greater than 0.1, the null hypothesis is rejected at 10% significance and hence it can be concluded that data are not normally distributed.

Therefore, Wilcoxon rank independent two sample test can be used.

Hypothesis

H0: µA=µB (No difference in hours of relief)

H1: µA≠µB (There is a difference in hours of relief)

**> wilcox.test(Drug\_A,Drug\_B,conf.level=0.90)**

Wilcoxon rank sum test with continuity correction

data: Drug\_A and Drug\_B

W = 51, p-value = 0.2364

alternative hypothesis: true location shift is not equal to 0

Warning message:

In wilcox.test.default(Drug\_A, Drug\_B, conf.level = 0.9) :

cannot compute exact p-value with ties

As p-value is greater than 0.1, the null hypothesis is not rejected at 10% significance and hence it can be concluded that there is no difference in hours of relief for two drugs.

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**> fitness<-read.table(file.choose(),header=T)**

**> fitness**

before after

1 60 61

2 70 71

3 40 38

4 41 39

5 40 38

6 40 33

7 45 55

8 48 56

9 30 38

10 50 68

**> attach(fitness)**

To check normality

H0: Data are normally distributed

H1: Data are not normally distributed

**> shapiro.test(before-after)**

Shapiro-Wilk normality test

data: before - after

W = 0.92716, p-value = 0.4206

As p-values are greater than 0.05, the null hypothesis is not rejected at 5% significance and hence it can be concluded that data are normally distributed.

Hypothesis

H0: µA ≤ µB

H1: µA-µB >0 🡪 µA > µB

**> t.test(after,before,alternative="greater",paired=T,conf.level=0.95)**

Paired t-test

data: after and before

t = 1.3916, df = 9, p-value = 0.09874

alternative hypothesis: true mean difference is greater than 0

95 percent confidence interval:

-1.046965 Inf

sample estimates:

mean difference

3.3

As p-values are greater than 0.05, the null hypothesis is not rejected at 5% significance and hence it can be concluded that the semester break has a no positive influence an the physical fitness of the students at 5% significance level.