## Hypothesis Testing: R Commands

| Sr No | Task/Test | Command [IGNORE THE > SIGN IN THE BEGINING while typing] |
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| **Parametric Tests** | | |
| | start | install.packages("psych")<br>library(psych) |
| 1 | One Sample t test [file: cs2m.csv]<br>Ho: Mu = 40 | Type<br>`> t.test(cs2m$Age, mu=40)` |
| 2 | Paired Sample t test [file: grades.csv]<br>Ho: Difference, d - D, (mu_Quiz1 – mu_Quiz2 = 0) | Type<br>`> t.test(x=grades$quiz1, y=grades$quiz2, alternative = "two.sided", mu=0, paired = TRUE)`<br>OR<br>`> t.test(grades$quiz1, grades$quiz2, paired = T)` |
| 3 | Independent Sample t test [file: cs2m.csv]<br>Ho: Mean BP of two anxiety levels is same in population<br>(ASSUMING **UNEQUAL** VARIANCE) | Type<br>`> t.test(cs2m$BP~cs2m$AnxtyLH)`<br>OR<br>`> t.test(y1,y2) # where y1 and y2 are numeric` |
| | Independent Sample t test [file: cs2m.csv]<br>Ho: Mean BP of two anxiety levels is same in population<br>(ASSUMING **EQUAL** VARIANCE) | Type<br>`> t.test(cs2m$BP~cs2m$AnxtyLH, var.equal = TRUE)` |
| | | You can use the **var.equal = TRUE** option to specify equal variances and a pooled variance estimate. You can use the **alternative="less"** or **alternative="greater"** option to specify a one tailed test. |
| 4 | One Sample Proportion Test:<br>A researcher believes that market size of diesel cars is 30%. For testing his belief, he had taken a sample of 130 cars and found 50 diesel cars.<br>Ho: p=0.30 | Type<br>`> prop.test(50,130, p=0.30, alternative = "two.sided", conf.level = 0.95, correct = F)`<br>Correct = F means without continuity correction, T means with continuity correction [NO DIFFERENCE FOUND IN RESULTS] |

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| 5 | Two Samples Proportion Test:<br>A researcher has found 10 stressed faculties out of a sample of 40 at Christ college and 22 out of 50 at St. John.<br>Ho: p1-p2 = 0 | Type<br>`> prop.test(c(10,22), c(40,50), alternative = "two.sided", conf.level = 0.95, correct = FALSE)` |
| 7 | One Way ANOVA [File: salescity.csv] | `> salescity <- read.csv("C:/Users/inurture1/Desktop/salescity.csv")`<br>`>  View(salescity)`<br>`> plot(sales~city, data=salescity, col = "blue")`<br>`> results<-aov(sales~city, data = salescity)`<br>`> summary(results)` |
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| **Non Parametric Tests** | | |
| 1 | Chi-square Test: [File: cs2m.csv]<br>Ho: There is no significant association between anxiety level and drug reaction | Type<br>`> chisq.test(cs2m$AnxtyLH, cs2m$DrugR)` |
| 2 | Wilcoxon Matched Pair - Small Sample (<,= 15) [File: wmps.csv] | Type<br>`> wilcox.test(wmps$before, wmps$after, paired = T)` |
| 3 | Wilcoxon Matched Pair - Large Sample (> 15) [File: wmpl.csv] | Type:<br>`> install.packages("exactRankTests")`<br>`> library(exactRankTests)`<br>`> wilcox.exact(wmpl$In2000, wmpl$In2005, paired = T, alternative = "two.sided", exact = FALSE)` |
| 4 | Mann-Whitney Small Sample (<,=20)<br>File: mws.csv | Type<br>`> wilcox.test(mws$prod, mws$mkt)` |
| 5 | Mann-Whitney Large Sample (>20)<br>File: mwl.csv | Type<br>`> wilcox.test(mwl$Prod, mwl$QC)` |

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| 6 | Kruskal Wallis Test [File: kw.csv] | Type<br>`> kruskal.test(rs~org, data = kw)` |
| 7 | Friedman ANOVA [File: fm.xlsx]<br><br>Use **R Commander** | `> friedman.test(.Responses)`<br><br>`Friedman rank sum test`<br><br>`data: .Responses`<br>`Friedman chi-squared = 18.16, df = 4, p-value = 0.001148` |