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STAT3004 Assignment 2

Question 1

***PARAMETRIC METHOD***

We examine the equal variances assumption by using F test for equal variances of 2 independent samples

vs

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| > var.test(data$fn1, data$fn2)  F test to compare two variances  data: data$fn1 and data$fn2  F = 0.80995, num df = 40, denom df = 40, p-value = 0.5081  alternative hypothesis: true ratio of variances is not equal to 1  95 percent confidence interval:  0.4319271 1.5188134  sample estimates:  ratio of variances  0.8099486 |

Since p-value , we do not reject at

We, then, use t test for equal means of 2 independent samples, given their variances are equal

vs

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| > t.test(data$fn1, data$fn2, var.equal = T)  Two Sample t-test  data: data$fn1 and data$fn2  t = 0.03004, df = 80, p-value = 0.9761  alternative hypothesis: true difference in means is not equal to 0  95 percent confidence interval:  -0.04774195 0.04920536  sample estimates:  mean of x mean of y  0.6648780 0.6641463 |

Since p-value , we do not reject at

***NONPARAMETRIC METHOD***

We use Wilcoxon rank-sum test to test whether 2 medians are equal for 2 independent samples

vs

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| > fn = c(data$fn1, data$fn2)  > label = c(rep("LST", length(data$fn1)), rep("HST", length(data$fn2)))  > wilcox.test(fn~label,  + alternative = "two.sided",  + mu = 0,  + paired = F,  + exact = F,  + correct = T,  + conf.int = F)  Two Sample t-test  data: data$fn1 and data$fn2  t = 0.03004, df = 80, p-value = 0.9761  alternative hypothesis: true difference in means is not equal to 0  95 percent confidence interval:  -0.04774195 0.04920536  sample estimates:  mean of x mean of y  0.6648780 0.6641463 |

Since p-value , we do not reject at

There are no difference in between parametric and nonparametric methods for the given dataset. Those methods suggest that there is no significant difference in mean or median BMD between lighter smoking and heavier smoking.