# Exam 2 Output

*ECO 230: Business and Economic Research and Communication*

## Math Scores and Nursury School Attendence

```
t.test(df$Math.Final)
```

```
##
##  One Sample t-test
##
## data:  df$Math.Final
## t = 43.313, df = 381, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##   9.915898 10.858971
## sample estimates:
## mean of x
##  10.38743
```

```
median.bs(df$Math.Final)
```

```
## $Confidence.Level
## [1] 0.95
##
## $Median.Confidence.Interval
##  2.5% 97.5%
##    10    11
##
## $Interpolated.Median.Confidence.Interval
##     2.5%    97.5%
## 10.31481 11.10784
##
## $Median
## [1] 11
##
## $Interpolated.Median
## [1] 10.68605
```

```
t.test(df$NurserySchool)
```

```
##
##  One Sample t-test
##
## data:  df$NurserySchool
## t = 40.502, df = 381, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  0.7721224 0.8509142
## sample estimates:
## mean of x
## 0.8115183
```

```r
t.test(df$NurserySchool, alternative="greater")
```

```
##
##  One Sample t-test
##
## data:  df$NurserySchool
## t = 40.502, df = 381, p-value < 2.2e-16
## alternative hypothesis: true mean is greater than 0
## 95 percent confidence interval:
##  0.7784809       Inf
## sample estimates:
## mean of x
## 0.8115183
```

```r
df.nursery <- filter(df, NurserySchool==1)
t.test(df.nursery$Math.Final)
```

```
##
##  One Sample t-test
##
## data:  df.nursery$Math.Final
## t = 39.265, df = 309, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##   9.967691 11.019405
## sample estimates:
## mean of x
##  10.49355
```

```r
t.test(df.nursery$Math.Final, mu=10)
```

```
##
##  One Sample t-test
##
## data:  df.nursery$Math.Final
## t = 1.8468, df = 309, p-value = 0.06574
## alternative hypothesis: true mean is not equal to 10
## 95 percent confidence interval:
##   9.967691 11.019405
## sample estimates:
## mean of x
##  10.49355
```

```r
t.test(df.nursery$Math.Final, mu=10, alternative="greater")
```

```
##
##  One Sample t-test
##
## data:  df.nursery$Math.Final
## t = 1.8468, df = 309, p-value = 0.03287
## alternative hypothesis: true mean is greater than 10
## 95 percent confidence interval:
##  10.05264      Inf
## sample estimates:
## mean of x
##  10.49355
```

```r
t.test(Math.Final ~ NurserySchool, data=df)
```

```
##
##  Welch Two Sample t-test
##
## data:  Math.Final by NurserySchool
## t = -0.92941, df = 108.02, p-value = 0.3547
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -1.7636919  0.6377062
## sample estimates:
## mean in group 0 mean in group 1
##        9.930556       10.493548
```

```r
t.test(Math.Final ~ NurserySchool, data=df, mu=10)
```

```
##
##  Welch Two Sample t-test
##
## data:  Math.Final by NurserySchool
## t = -17.438, df = 108.02, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 10
## 95 percent confidence interval:
##  -1.7636919  0.6377062
## sample estimates:
## mean in group 0 mean in group 1
##        9.930556       10.493548
```

```r
t.test(Math.Final ~ NurserySchool, data=df, mu=10, alternative="greater")
```

```
##
##  Welch Two Sample t-test
##
## data:  Math.Final by NurserySchool
## t = -17.438, df = 108.02, p-value = 1
## alternative hypothesis: true difference in means is greater than 10
## 95 percent confidence interval:
##  -1.567982       Inf
## sample estimates:
## mean in group 0 mean in group 1
##        9.930556       10.493548
```

```r
t.test(x=df$Math.Final, y=df$NurserySchool, paired=TRUE)
```

```
##
##  Paired t-test
##
## data:  df$Math.Final and df$NurserySchool
## t = 39.947, df = 381, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##   9.104587 10.047246
## sample estimates:
## mean of the differences
##                9.575916
```

```r
wilcox.test(Math.Final ~ NurserySchool, data=df)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  Math.Final by NurserySchool
## W = 10628, p-value = 0.5275
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(x=df$Math.Final, y=df$NurserySchool, paired=TRUE)
```

```
##
##  Wilcoxon signed rank test with continuity correction
##
## data:  df$Math.Final and df$NurserySchool
## V = 69286, p-value < 2.2e-16
## alternative hypothesis: true location shift is not equal to 0
```

```r
cor.test(x=df$Math.Final, y=df$NurserySchool, method="pearson")
```

```
##
##  Pearson's product-moment correlation
##
## data:  df$Math.Final and df$NurserySchool
## t = 0.91793, df = 380, p-value = 0.3592
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  -0.05355369  0.14668241
## sample estimates:
##        cor
## 0.04703687
```

```r
cor.test(x=df$Math.Final, y=df$NurserySchool, method="spearman")
```

```
## Warning in cor.test.default(x = df$Math.Final, y = df$NurserySchool, method
## = "spearman"): Cannot compute exact p-value with ties
```

```
##
##  Spearman's rank correlation rho
##
## data:  df$Math.Final and df$NurserySchool
## S = 8989400, p-value = 0.5278
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##        rho
## 0.03239844
```

### Final Score in Math vs Portuguese

```r
t.test(df$Math.Final)
```

```
##
##  One Sample t-test
##
## data:  df$Math.Final
```

```
## t = 43.313, df = 381, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##   9.915898 10.858971
## sample estimates:
## mean of x
##  10.38743
```

```
median.bs(df$Math.Final)
```

```
## $Confidence.Level
## [1] 0.95
##
## $Median.Confidence.Interval
##  2.5% 97.5%
##    10    11
##
## $Interpolated.Median.Confidence.Interval
##     2.5%    97.5%
## 10.31034 11.10000
##
## $Median
## [1] 11
##
## $Interpolated.Median
## [1] 10.68605
```

```
t.test(df$Portuguese.Final)
```

```
##
##  One Sample t-test
##
## data:  df$Portuguese.Final
## t = 83.05, df = 381, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  12.21940 12.81202
## sample estimates:
## mean of x
##  12.51571
```

```
median.bs(df$Portuguese.Final)
```

```
## $Confidence.Level
## [1] 0.95
##
## $Median.Confidence.Interval
##  2.5% 97.5%
##    12    13
##
## $Interpolated.Median.Confidence.Interval
##     2.5%    97.5%
## 12.24647 12.84328
##
## $Median
## [1] 13
```

```
##
## $Interpolated.Median
## [1] 12.56349
```

```
mean(df$Portuguese.Final, na.rm=TRUE)
```

```
## [1] 12.51571
```

```
mean(df$Math.Final, na.rm=TRUE)
```

```
## [1] 10.38743
```

```
t.test(x=df$Portuguese.Final, y=df$Math.Final)
```

```
##
##  Welch Two Sample t-test
##
## data:  df$Portuguese.Final and df$Math.Final
## t = 7.514, df = 641.31, p-value = 1.934e-13
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  1.572083 2.684461
## sample estimates:
## mean of x mean of y
##  12.51571  10.38743
```

```
t.test(x=df$Portuguese.Final, y=df$Math.Final, paired=TRUE)
```

```
##
##  Paired t-test
##
## data:  df$Portuguese.Final and df$Math.Final
## t = 9.9771, df = 381, p-value < 2.2e-16
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  1.708848 2.547697
## sample estimates:
## mean of the differences
##                2.128272
```

```
wilcox.test(x=df$Portuguese.Final, y=df$Math.Final)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df$Portuguese.Final and df$Math.Final
## W = 94255, p-value = 2.315e-12
## alternative hypothesis: true location shift is not equal to 0
```

```
wilcox.test(x=df$Portuguese.Final, y=df$Math.Final, paired=TRUE)
```

```
##
##  Wilcoxon signed rank test with continuity correction
##
## data:  df$Portuguese.Final and df$Math.Final
## V = 46860, p-value < 2.2e-16
## alternative hypothesis: true location shift is not equal to 0
```

```r
cor.test(x=df$Portuguese.Final, y=df$Math.Final, method="pearson")
```

```
##
##  Pearson's product-moment correlation
##
## data:  df$Portuguese.Final and df$Math.Final
## t = 10.676, df = 380, p-value < 2.2e-16
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
##  0.3992545 0.5539866
## sample estimates:
##       cor
## 0.4803494
```

```r
cor.test(x=df$Portuguese.Final, y=df$Math.Final, method="spearman")
```

```
## Warning in cor.test.default(x = df$Portuguese.Final, y = df$Math.Final, :
## Cannot compute exact p-value with ties
```

```
##
##  Spearman's rank correlation rho
##
## data:  df$Portuguese.Final and df$Math.Final
## S = 4190600, p-value < 2.2e-16
## alternative hypothesis: true rho is not equal to 0
## sample estimates:
##       rho
## 0.5489371
```