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Course Code:PMDS503P
Course Title: Statistical Inference Lab
DA5

Q1:

```
#H0: Median difference between capiler1 and capiler 2 is 0
# H1: Median difference is not 0
# capiler-1 data
capiler1<- c(0.265,0.265,0.266,0.267,0.267,0.265,0.267,0.267,0.265,0.268,0.268,0.265)
capiler2<-c(0.264,0.265,0.264,0.266,0.267,0.268,0.264,0.265,0.265,0.267,0.268,0.269)
result1<- wilcox.test(capiler1,capiler2,paired = TRUE, alternative= "two.sided", exact = FAI
cat("Test statistic:", result1$statistic)

## Test statistic: 21.5

cat("p-value:", result1$p.value)

## p-value: 0.672144

cat("Conclusion: ", ifelse(result1$p.value<0.05,"Reject H0","Fail to reject H0"))

## Conclusion:  Fail to reject H0
```

Conclusion:
There is no significant difference between the medians of the population of measurements represented by the two samples.

Q2:

```
# H0: mu = 8.5
# H1: mu != 8.5
# alpha = 0.05
titanium <- c(8.32, 8.05, 8.93, 8.65, 8.25,
              8.46, 8.52, 8.35, 8.36, 8.41,
              8.42, 8.30, 8.71, 8.75, 8.60,
              8.83, 8.50, 8.38,8.29, 8.46)
result<- wilcox.test(titanium, mu = 8.5, alternative = "two.sided",exact = FALSE)
cat("Test Statistic:", result$statistic)

## Test Statistic: 80.5

cat("p-value:", result$p.value)

## p-value: 0.5730136
```

```r
cat("Conclusion:",ifelse(result1$p.value<0.05,"Reject H0","Fail to reject H0"))

## Conclusion: Fail to reject H0
```

Conclusion:
mu = 8.5
Q3:

```r
# H0: mu1= mu2
# H1: mu1> mu2
# alpha = 0.10
circuit1<-c(251,255, 258, 257, 250, 251, 254, 250, 248)
circuit2<-c(250, 253, 249, 256, 259, 252, 260, 251)
result <- wilcox.test(circuit1,circuit2, alternative = "greater",exact = FALSE)
cat("Test Statistic:", result$statistic)

## Test Statistic: 30

cat("p-value:", result$p.value)

## p-value: 0.7351786

cat("Conclusion:",ifelse(result1$p.value<0.10,"Reject H0","Fail to reject H0"))

## Conclusion: Fail to reject H0
```

Conclusion:
mu1 = mu2
Q4:

```r
# H0: Data fits normal distribution N(mu = 10.5, sigma = 0.15)
# H1: Data does not fit normal distribution N(mu = 10.5, sigma = 0.15)
wire<-c(10.4, 10.6, 10.1, 10.3, 10.2, 10.9,
        10.5, 10.8, 10.6, 10.5, 10.7, 10.2, 10.7, 10.3, 10.4, 10.5)
mu<- 10.5
sigma<-0.15
result <- ks.test(wire,"pnorm", mean = mu, sd = sigma)

## Warning in ks.test.default(wire, "pnorm", mean = mu, sd = sigma):
ties should not be present for the one-sample Kolmogorov-Smirnov test

cat("Test Statistic:", result$statistic)

## Test Statistic: 0.2212888

cat("p-value:", result$p.value)

## p-value: 0.4135523
```

```r
cat("Conclusion:",ifelse(result1$p.value<0.05,"Reject H0","Fail to reject H0"))
```

```
## Conclusion: Fail to reject H0
```

Conclusion:
Data fits normal distribution N(mu = 10.5, sigma = 0.15)