MATH 324 Homework 5

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Question 1 Parts A-D

```
WIM = c(26, 29.9, 39.5, 25.1, 31.6, 36.2, 25.1, 31, 35.6, 40.2)

ST = c(27.9, 29.1, 38, 27, 30.3, 34.5, 27.8, 29.6, 33.1, 35.5)

(DIFF = WIM - ST)
```

```
##  [1] -1.9  0.8  1.5 -1.9  1.3  1.7 -2.7  1.4  2.5  4.7
```

```
(sample_mean = mean(DIFF))
```

```
## [1] 0.74
```

```
(sample_sd = sd(DIFF))
```

```
## [1] 2.280448
```

```
t.test(DIFF)
```

```
##
##  One Sample t-test
##
## data:  DIFF
## t = 1.0262, df = 9, p-value = 0.3316
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  -0.8913344  2.3713344
## sample estimates:
## mean of x
##      0.74
```

1. $\bar{d} = 0.7400$
2. $s_d = 2.280$
3. $t = 1.0262$
4. $p - value = 0.3316$
5. $df = 9$
6. CI = (-0.891, 2.713)

Because our p-value was so small, the only values where we would reject the null hypothesis would be $\alpha = 0.40$.

Question 2 Parts A-F

```r
males = c(71, 93, 101, 84, 88, 117, 86, 86, 93, 86, 106)
females = c(57, 54, 90, 71, 71, 68, 73)

(x1_bar = mean(males))
```

```
## [1] 91.90909
```

```r
(x2_bar = mean(females))
```

```
## [1] 69.14286
```

```r
(s1 = sd(males))
```

```
## [1] 12.38107
```

```r
(s2 = sd(females))
```

```
## [1] 11.79588
```

```r
(samp_variance = (10*s1^2 + 6*s2^2)/16)
```

```
## [1] 147.9854
```

```r
(DIFF_2 = x1_bar - x2_bar)
```

```
## [1] 22.76623
```

```r
(s12 = sqrt(s1^2/11 + s2^2/7))
```

```
## [1] 5.814902
```

```r
#22.766 +- 16.985 This would be the confidence interval for 99% confidence interval.

s12*2.921 #2.921 was a t-value that I got from the t-table handout.
```

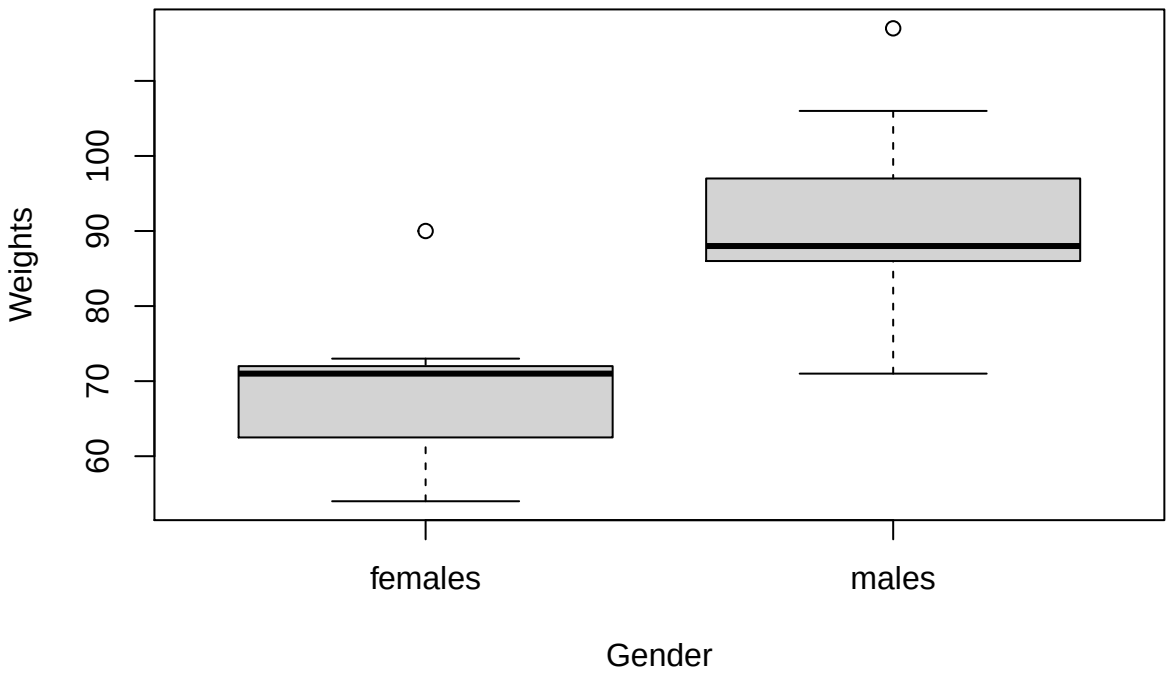
```
## [1] 16.98533
```

1. $\bar{x_1} = 91.919$
2. $\bar{x_2} = 69.14$
3. $s_1 = 12.38$
4. $s_2 = 11.79$
5. $S_p^2 = 147.98$
6. $t = 2.921$
7. CI $= (5.871, 39.661)$

Question 3

```r
dat = as.data.frame(cbind(c(rep("males", 11), rep("females", 7)), c(males, females)))

boxplot(as.numeric(V2)~V1, data = dat, xlab = "Gender", ylab = "Weights")
```




```
t.test(males, females, paired = F, var.equal = F, alternative = "g")
```

```
##
##  Welch Two Sample t-test
##
## data:  males and females
## t = 3.9152, df = 13.408, p-value = 0.0008394
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
##  12.49233      Inf
## sample estimates:
## mean of x mean of y
##  91.90909  69.14286
```

```
1-pt(2.921, df = 16)
```

```
## [1] 0.004997732
```