

Quiz 4 R Script

```
> library(NCStats)
> library(dplyr)
> setwd("C:/aaaWork/Web/GitHub/NCMTH107/Year_Specific/F19")
> plt <- FALSE
>
>
> ## Chi-Square test
> ( obs <- matrix(c(129,46,215,7,9,24),nrow=3,
+               dimnames=list(c("Blue","Gold","Red"),
+                             c("Lived","Died")))) )
```

	Lived	Died
Blue	129	7
Gold	46	9
Red	215	24

```
> ( chi1 <- chisq.test(obs,correct=FALSE) )
```

Pearson's Chi-squared test with obs
X-squared = 6.1886, df = 2, p-value = 0.04531

```
> round(chi1$expected,3)
```

	Lived	Died
Blue	123.349	12.651
Gold	49.884	5.116
Red	216.767	22.233

```
> ## 2-Sample t-test
> d <- readxl::read_excel("HouseMouse.xlsx") %>%
+   select(liver,generation) %>%
+   mutate(generation2=FSA::mapvalues(generation,
+                                     from=c("F0","F1"),to=c("Cap","Cap")))
> levenesTest(liver~generation2,data=d)
```

Levene's Test for Homogeneity of Variance (center = median)

	Df	F value	Pr(>F)
group	1	0.4287	0.5147
	73		

```
> ( sum1 <- Summarize(liver~generation2,data=d,digits=3) )
```

	generation2	n	nvalid	mean	sd	min	Q1	median	Q3	max
1	Cap	53	52	0.760	0.188	0.50	0.618	0.725	0.858	1.39
2	W	23	23	0.871	0.240	0.58	0.730	0.760	0.965	1.47

```
> ( stat <- diff(sum1[, "mean"]) )
```

```
[1] 0.111
```

```
> ( df1 <- sum(sum1[, "n"])-2 )
```

```
[1] 74
```

```
> ( sp2 <- (sum1[1, "n"]*sum1[1, "sd"]^2+sum1[2, "n"]*sum1[2, "sd"]^2)/df1 )
```

```

[1] 0.04321665
> ( se1 <- sqrt(sp2*(1/sum1[1,"n"]+1/sum1[2,"n"])))

[1] 0.05190754
> ( t1 <- stat/se1 )

[1] 2.138417
> ( pval1 <- distrib(t1,distrib="t",df=df1,lower.tail=FALSE,plot=plt)*2 )

[1] 0.0357838
> ( tstar1 <- distrib(0.975,distrib="t",df=df1,type="q",plot=plt) )

[1] 1.992544
> stat+c(-1,1)*tstar1*se1

[1] 0.007571959 0.214428041
> ## 1-sample t-test
> xbar <- 1.94
> s <- 0.54
> n <- 15
> ( se2 <- s/sqrt(n) )

[1] 0.1394274
> mu0 <- 1.15
> ( t2 <- (xbar-mu0)/se2 )

[1] 5.666031
> ( pval2 <- distrib(t2,distrib="t",df=n-1,lower.tail=FALSE,plot=plt) )

[1] 2.91e-05
> ( tstar2 <- distrib(0.99,distrib="t",df=n-1,lower.tail=FALSE,type="q",plot=plt))

[1] -2.624494
> xbar+tstar2*se2

[1] 1.574074

```