R script

1) **Hypothesis sample test**

```
n = 5           ##sample size
sd = 0.33       ##standard deviation
xbar = 7.5      ##sample mean
mu = 7.8        ##null hypothesis
alpha =0.05     ##significance level

##Calculate Z statistics
z = (xbar-mu)/(sd/sqrt(n))

##Display Z statistics
c(z)

## Calculate critical value
z.alpha = qnorm(1-(alpha/2))

##Display Value of Z CV
c(-z.alpha, z.alpha)

##Calculate p-value for Z
pval = 2*pnorm(z)

##Display Value P-Value
c (pval)
```

2) **Correlation test**

```
x <- c(2003, 1013, 1529, 1506, 1499)
y <- c(7.5, 7.6, 7.8, 7.0, 7.8)

#calculate corr. coefficient
cor(x,y)
plot(x,y, xlim=c(1000,2100), ylim=c(0,10), xlab="Number of People", ylab="Mean of
Happiness")
```

3) **Regression test**

```
x <- c(2003, 1013, 1529, 1506, 1499)
y <- c(7.5, 7.6, 7.8, 7.0, 7.8)
#calculate regression coefficient
model<- lm(y~x)
model

#calculate corr. coefficient
cor(x,y)
#plot scatter plot
plot(x,y, xlim=c(1000,2100), ylim=c(0,10), xlab="Number of People", ylab="Mean of
Happiness")
#calculate R squared
summary(model)
```

4) **Chi-Square test**

```
meanHappiness <- c(7.5,7.6,7.8,7.0,7.8)
alpha <- 0.05
#calculate chi-square test
output <- chisq.test(meanHappiness, correct = FALSE)
```

5) **Anova test**

```
#calculate anova test
one.way<-aov(y~x)
summary(one.way)
```