

## Εργαστηριακή Άσκηση 4

### Θέμα: Στατιστική Συμπερασματολογία

1.

```
> Height<-c(3.33, 5.87, 6.31, 1.98, 4.86, 2.65, 2.78, 2.21, 0.45, 1.51, 0.56,  
3.68, 2.16, 3.15, 0.84, 3.95, 4.16, 2.99, 2.15, 6.78, 2.84, 4.23, 2.89, 2.56, 2.65,  
1.54, 0.98, 0.87)
```

```
> Position<-c(1,2,2,2,1,2,1,1,2,1,2,1,1,1,1,1,1,1,1,2,2,1,2,1,1,2,2,2,2)
```

```
> Height_north<-Height[Position==1]
```

```
> Height_south<-Height[Position==2]
```

a.

```
> hist(Height_north)  
> hist(Height_north, nclass=8)  
> qqnorm(Height_north)  
> qqline(Height_north)  
> length(Height_north)  
> mean (Height_north)  
> t.test(Height_north, mu=2)  
> wilcox.test(Height_north,mu=2)
```

b.

```
> hist(Height_south)  
> qqnorm(Height_south)  
> qqline(Height_south)  
> length(Height_south)  
> mean (Height_south)  
> t.test(Height_south, mu=1.5, alternative="greater", conf.level=0.98)  
> wilcox.test(Height_south, mu=1.5, alternative="greater",  
conf.level=0.98)  
> table(Height_south)
```

c.

```
> t.test(Height_north, mu=2, alternative="less", conf.level=0.90)  
wilcox.test(Height_north, mu=2, alternative="less", conf.level=0.90)
```

- d.
- ```
> boxplot(Height_north, Height_south ,names=c('North Greece','South Greece'), main="Height (meters) of a particular plant according to its Geographical Position")
> var(Height_north)
> var(Height_south)
> var.test(Height_north, Height_south)
> t.test(Height_north, Height_south, var.equal=TRUE)
> t.test(Height_north, Height_south, var.equal=FALSE)
> wilcox.test(Height_north, Height_south)
```
- e.
- ```
> t.test(Height_north, Height_south, var.equal=TRUE, conf.level=0.99)
> t.test(Height_north, Height_south, var.equal=FALSE, conf.level=0.99)
> wilcox.test(Height_north, Height_south, conf.level=0.99)
```
- f.
- ```
> t.test(Height_north, Height_south, var.equal=TRUE,
alternative="greater", conf.level=0.90)
> t.test(Height_north, Height_south, var.equal=FALSE,
alternative="greater", conf.level=0.90)
> wilcox.test(Height_north, Height_south, ,alternative="greater",
conf.level=0.90)
```
- 2.
- a.
- ```
> 8*0.5
> prop.test(3,8, p=0.5)
> binom.test(3,8, p=0.5)
> binom.test(3,8, p=0.5, conf.level=0.98)
> binom.test(3,8, p=0.5, conf.level=0.90)
```
- b.
- ```
> 80*0.5
> prop.test(30,80, p=0.5)
> prop.test(30,80, p=0.5, conf.level=0.98)
> prop.test(30,80, p=0.5, conf.level=0.90)
```
- c.
- ```
> 800*0.5
> prop.test(300,800, p=0.5)
> prop.test(300,800, p=0.5, conf.level=0.98)
> prop.test(300,800, p=0.5, conf.level=0.90)
```

3.

a.

```
> coin<-c(rep('A', 50), rep('B', 40))
> head<-c(rep('No', 30), rep('Yes', 20), rep('No', 30), rep('Yes', 10))
> table(coin, head)
> prop.table(table(coin, head))
> prop.table(table(coin, head),1)
> prop.table(table(coin, head),2)

> barplot(prop.table(table(coin, head)), names.arg=c("Tail", "Head"),
legend.text=c("Coin A", "Coin B"), col=c(1,2))
```

b.

```
> x<-c(20,10)
> n<-c(50,40)
> prop.test(x,n,correct="false")
> prop.test(x,n)
```

c.

```
> prop.test(x,n, alternative="greater", correct="false")
> prop.test(x,n, alternative="greater")
```

d.

```
> prop.test(x,n, alternative="less", correct="false")
> prop.test(x,n, alternative="less")
```