```
> pf(4.3,5,54)
[1] 0.9977006
> 1-pf(4.3,5,54)
[1] 0.002299405
> qf(0.95,5,54)
[1] 2.38607
> y1 <- c(18.2, 20.1, 17.6, 16.8, 18.8, 19.3, 19.1)
> y2 <- c(17.4, 18.7, 19.1, 16.4, 15.2, 18.4)
> y3 <- c(15.2, 18.8, 17.7, 16.5, 15.9, 17.1, 16.3)
> y1
[1] 18.2 20.1 17.6 16.8 18.8 19.3 19.1
> y2
[1] 17.4 18.7 19.1 16.4 15.2 18.4
> y3
[1] 15.2 18.8 17.7 16.5 15.9 17.1 16.3
> y<-c(y1, y2, y3)
> n<-c(7, 6, 7)
> group<-c(rep(1,7), rep(2,6), rep(3,7))
> ydata<-data.frame(y=y, group=factor(group))
> ydata
      y group
1  18.2     1
2  20.1     1
3  17.6     1
4  16.8     1
5  18.8     1
6  19.3     1
7  19.1     1
8  17.4     2
9  18.7     2
10 19.1     2
11 16.4     2
12 15.2     2
13 18.4     2
14 15.2     3
15 18.8     3
16 17.7     3
17 16.5     3
18 15.9     3
19 17.1     3
20 16.3     3
> anova(lm(y~group,ydata))
Analysis of Variance Table

Response: y
          Df Sum Sq Mean Sq F value
group      2 11.063  5.5315  3.4396
```

```
Residuals 17 27.339  1.6082
          Pr(>F)
group     0.05567 .
Residuals
---
Signif. codes:
  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05
  ‘.’ 0.1 ‘ ’ 1
> anova(lm(y~group,ydata))
Analysis of Variance Table

Response: y
          Df Sum Sq Mean Sq F value  Pr(>F)
group      2 11.063  5.5315  3.4396 0.05567 .
Residuals 17 27.339  1.6082
---
Signif. codes:
0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
> anova(lm(ydata$y~ydata$group))
Analysis of Variance Table

Response: ydata$y
           Df Sum Sq Mean Sq F value  Pr(>F)
ydata$group  2 11.063  5.5315  3.4396 0.05567 .
Residuals   17 27.339  1.6082
---
Signif. codes:
0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
> group<-c(rep(1,7), rep(2,6), rep(1,7))
> ydata<-data.frame(y=y, group=factor(group))
> ydata
      y group
1  18.2     1
2  20.1     1
3  17.6     1
4  16.8     1
5  18.8     1
6  19.3     1
7  19.1     1
8  17.4     2
9  18.7     2
10 19.1     2
11 16.4     2
12 15.2     2
13 18.4     2
14 15.2     1
15 18.8     1
```

```
16 17.7     1
17 16.5     1
18 15.9     1
19 17.1     1
20 16.3     1
> anova(lm(ydata$y~ydata$group))
Analysis of Variance Table

Response: ydata$y
             Df Sum Sq Mean Sq F value Pr(>F)
ydata$group  1  0.080  0.0801  0.0376 0.8484
Residuals   18 38.322  2.1290
> t.test(c(y1,y3),y2,var.equal=T)
```