Multiple regression example using the stackloss data in R.

```
> data(stackloss)
> y<-stackloss[,4]
> x1<-stackloss[,1]
> x2<-stackloss[,2]
> x3<-stackloss[,3]
> mr.lm<-lm(y~x1 + x2 + x3)
> summary(mr.lm)

Call:
lm(formula = y ~ x1 + x2 + x3)

Residuals:
    Min      1Q  Median      3Q     Max
-7.2377 -1.7117 -0.4551  2.3614  5.6978

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -39.9197    11.8960  -3.356  0.00375 **
x1            0.7156     0.1349   5.307  5.8e-05 ***
x2            1.2953     0.3680   3.520  0.00263 **
x3           -0.1521     0.1563  -0.973  0.34405
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 3.243 on 17 degrees of freedom
Multiple R-squared:  0.9136,        Adjusted R-squared:  0.8983
F-statistic:  59.9 on 3 and 17 DF,  p-value: 3.016e-09
```

As before we can find prediction and CI intervals.

```
> predict(mr.lm,int="c",data.frame(x1=65,x2=21,x3=87))

       fit      lwr      upr
1 20.56329 18.58431 22.54227

> predict(mr.lm,int="p",data.frame(x1=65,x2=21,x3=87))

       fit      lwr     upr
1 20.56329 13.43997 27.6866
```

We can find anova tables.

```
> anova(mr.lm)

Analysis of Variance Table

Response: y
          Df  Sum Sq Mean Sq  F value    Pr(>F)
x1         1 1750.12 1750.12 166.3707 3.309e-10 ***
x2         1  130.32  130.32  12.3886  0.002629 **
x3         1    9.97    9.97   0.9473  0.344046
Residuals 17  178.83   10.52
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> anova(lm(y~x3 + x2 + x1))

Analysis of Variance Table

Response: y
          Df  Sum Sq Mean Sq F value    Pr(>F)
x3         1  330.80  330.80  31.446 3.138e-05 ***
x2         1 1263.38 1263.38 120.100 3.980e-09 ***
x1         1  296.23  296.23  28.160 5.799e-05 ***
Residuals 17  178.83   10.52
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Now for two plots

```
> par(mfrow=c(1,2))
> plot(mr.lm)
```

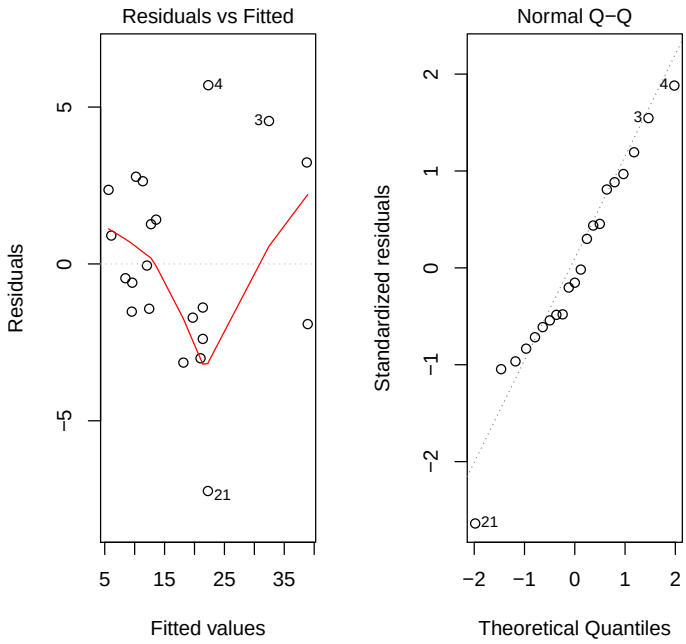
Residuals vs Fitted
Residuals
Fitted values
5
15
25
35
−5
0
5
4
3
21
Normal Q−Q
Standardized residuals
Theoretical Quantiles
−2
−1
0
1
2
4
3
21

Figure 1: