R(3)

1.不同玉米材料农艺性状有较大差异，通过对不同自交系穗长、穗粗、穗行数、株高、穗位高、散粉期和果穗重的测定，试写出果穗重的回归模型，诊断是否存在异常值。

```
a=read.table("C:\\Users\\czh\\Desktop\\1.txt",header=T,sep="\t")

lm1=lm(a[,8] ~ a[,2]+a[,3]+a[,4]+a[,5]+a[,6]+a[,7],data=a)

lm1
```

a[,8]代表最后一列，其余同理.....可以看到回归方程为：

$earweight = -66.27904 + 4.93213 \times earlong + 3.19007 \times earwidth \ldots\ldots$（略）

```
Call:
lm(formula = a[, 8] ~ a[, 2] + a[, 3] + a[, 4] + a[, 5] + a[,
    6] + a[, 7], data = a)

Coefficients:
(Intercept)       a[, 2]       a[, 3]       a[, 4]       a[, 5]       a[, 6]
  -66.27904      4.93213      3.19007     -0.33549      0.11799      0.05596
     a[, 7]
   -1.07416
```

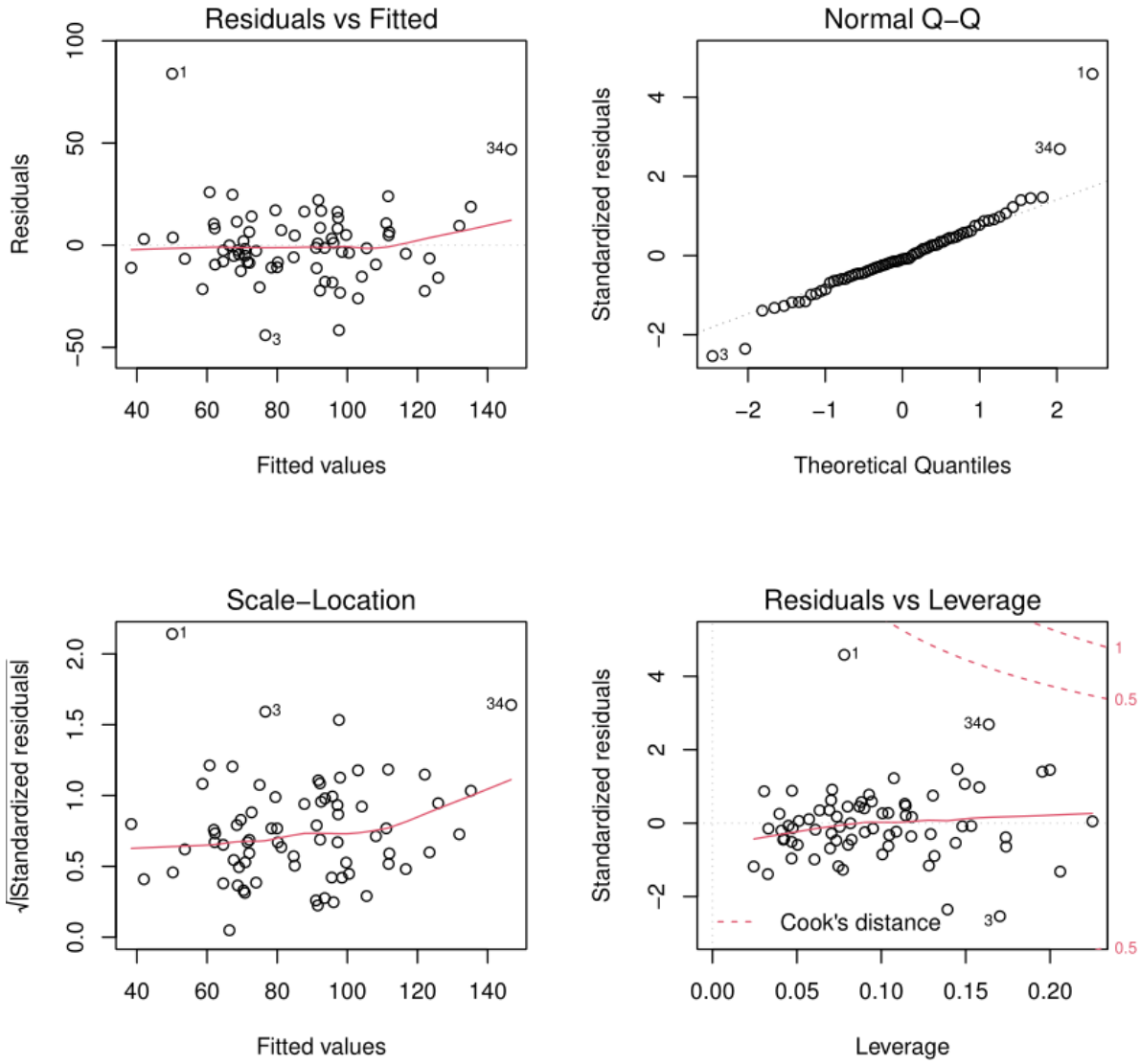
然后输入如下代码：

```
summary(lm1)
```

```
Call:
lm(formula = a[, 8] ~ a[, 2] + a[, 3] + a[, 4] + a[, 5] + a[,
    6] + a[, 7], data = a)

Residuals:
    Min      1Q  Median      3Q     Max
-44.028  -9.464  -1.642   8.300  83.945

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) -66.27904   35.37115  -1.874 0.065452 .
a[, 2]        4.93213    1.30169   3.789 0.000333 ***
a[, 3]        3.19007    0.70855   4.502 2.86e-05 ***
a[, 4]       -0.33549    1.40051  -0.240 0.811436
a[, 5]        0.11799    0.11606   1.017 0.313084
a[, 6]        0.05596    0.20959   0.267 0.790318
a[, 7]       -1.07416    0.51075  -2.103 0.039334 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 19.06 on 65 degrees of freedom
Multiple R-squared:  0.6005,    Adjusted R-squared:  0.5637
F-statistic: 16.29 on 6 and 65 DF,  p-value: 2.423e-11
```

然后输入如下代码：

```
par(mfrow=c(2,2))
plot(lm1)
```



2.将三种不同菌型的伤寒病毒a、b、c分别接种于10,9,11只小白鼠上，观察其存活天数，问三种菌型下小白鼠的平均存活天数是否有显著性差异。 a菌株：2,4,3,2,4,7,7,2,5,4 b菌株：5,6,8,5,10,7,12,6,6 c菌株：7,11,6,6,7,9,5,10,6,3,10

由于比较平均存活天数是否有显著差异，因此用t检验：

```
h1=c(2,4,3,2,4,7,7,2,5,4)

h2=c(5,6,8,5,10,7,12,6,6)

h3=c(7,11,6,6,7,9,5,10,6,3,10)

t.test(h1,h2)

t.test(h2,h3)

t.test(h1,h3)
```

结果如下：

第一组与第二组对比：

```
        Welch Two Sample t-test

data:  h1 and h2
t = -3.2413, df = 15.24, p-value = 0.005387
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -5.338236 -1.106208
sample estimates:
mean of x mean of y
 4.000000  7.222222
```

第二组与第三组对比：

```
        Welch Two Sample t-test

data:  h2 and h3
t = -0.046497, df = 17.405, p-value = 0.9634
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -2.33812  2.23711
sample estimates:
mean of x mean of y
 7.222222  7.272727
```

第一组与第三组对比：

```
        Welch Two Sample t-test

data:  h1 and h3
t = -3.4447, df = 18.527, p-value = 0.002795
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -5.264722 -1.280732
sample estimates:
mean of x mean of y
 4.000000  7.272727
```

可以看到2和3之间差异较小，1和2、1和3有显著差异。