**With list subscripts**

The model object is a list with many components. Here each of them is explained in turn. The first is the model formula (or ‘Call’) showing the response variable (growth) and the explanatory variable(s) (tannin):

```
summary(model)[[1]]
```

```
lm(formula = growth ~ tannin)
```

The second describes the attributes of the object called `summary(model)`:

```
summary(model)[[2]]
```

```
growth ~ tannin
attr(, "variables")
list(growth, tannin)
attr(, "factors")
  tannin
growth 0
tannin 1
attr(, "term.labels")
[1] "tannin"
attr(, "order")
[1] 1
attr(, "intercept")
[1] 1
attr(, "response")
[1] 1
attr(, ".Environment")
<environment: R_GlobalEnv>
attr(, "predvars")
list(growth, tannin)
attr(, "dataClasses")
  growth  tannin
"numeric" "numeric"
```

The third gives the residuals for the nine data points:

```
summary(model)[[3]]
```

```
    1    2    3    4    5
0.2444444 -0.5388889 -1.3222222 2.8944444 -0.8888889
   6    7    8    9
1.3277778 -2.4555556 -0.2388889 0.9777778
```

The fourth gives the parameter table, including standard errors of the parameters, \( t \) values and \( p \) values:

```
summary(model)[[4]]
```

```
                  Estimate  Std. Error     t value  Pr(>|t|)  
(Intercept)  11.755556   1.0407991  11.294740  9.537315e-06
   tannin   -1.216667   0.2186115  -5.655427   8.460738e-04
```

The fifth is concerned with whether the corresponding components of the fit (the model frame, the model matrix, the response or the QR decomposition) should be returned. The default is FALSE:
summary(model)[[5]]

(Intercept)  tannin
   FALSE   FALSE

The sixth is the residual standard error: the square root of the error variance from the summary.aov table (which is not shown here: \( s^2 = 2.867 \); see p. 396):

summary(model)[[6]]

[1] 1.693358

The seventh shows the number of rows in the summary.lm table (showing two parameters to have been estimated from the data with this model, and the residual degrees of freedom (d.f. = 7):

summary(model)[[7]]

[1] 2 7 2

The eighth is \( r^2 = \frac{SSR}{SST} \), the fraction of the total variation in the response variable that is explained by the model (see p. 399 for details):

summary(model)[[8]]

[1] 0.8156633

The ninth is the adjusted \( R^2 \), explained on p. 399 but seldom used in practice:

summary(model)[[9]]

[1] 0.7893294

The tenth gives \( F \) ratio information: the three values given here are the \( F \) ratio (30.97398), the number of degrees of freedom in the model (i.e. in the numerator: numdf) and the residual degrees of freedom (i.e. in the denominator: dendf):

summary(model)[[10]]

    value numdf dendf
30.97398  1.00000  7.00000

The eleventh component is the correlation matrix of the parameter estimates:

summary(model)[[11]]

     (Intercept)  tannin
(Intercept)  0.37777778 -0.06666667
  tannin       -0.06666667  0.01666667

You will often want to extract elements from the parameter table that was the fourth object above. The first of these is the intercept (\( a \), the value of growth at tannin = 0):

summary(model)[[4]][[1]]

[1] 11.75556

The second is the slope (\( b \), the change in growth per unit change in tannin):

summary(model)[[4]][[2]]

[1] -1.216667