Suppose that \( d \) is a data frame and that the variables in \( d \) are \( x \), the explanatory variable, and \( y \), the response variable.

### Plotting

In lattice graphics, use

\[
> xyplot(y\sim x, data=d)
\]

In base graphics, use

\[
> plot(y\sim x, data=d)
\]

Options for each include:

- `type=c('p','r')` plots points and regression line
- `main='my title'` title for the whole plot
- `xlab='x label'` label for \( x \)-axis, similarly for \( y \)-axis

### Linear Model

\[
> ld = lm(y\sim x, data=d)
\]

The result of `lm()` is an object that contains various quantities related to the linear model. The following functions return some of these:

- `residuals(ld)`
- `fitted(ld)`
- `coef(ld)`

Printing the model object \( ld \) itself returns the coefficients.

### Inference for the Linear Model

To make inferences about the coefficients of the model, the following functions are provided:

- `summary(ld)`
- `confint(ld)`
- `anova(ld)`

### Predictions and inferences about predictions

To make predictions, one has to construct a dataframe with a vector for values of the explanatory variable.

\[
> a=data.frame(x=c(2,3))
\]

\[
> predict(ld,a)
\]

\[
> predict(ld,a,interval='confidence')
\]

\[
> predict(ld,a,interval='prediction')
\]

### Graphical diagnostics

Graphical diagnostics can be plotted with

\[
> plot(ld)
\]