1 Weighted Regression

Homoscedasticity - the standard deviations of y-observations from the straight line are the same independently of the underlying x-observations.

Heteroscedasticity - the standard deviations of y-observations depend on the underlying x-observations.

In the first case, standard regression analysis should be performed, while in the second the weighted regression is more suitable.

```
>Conc=c(0,2,4,6,8,10)
>StDev=c(0.001,0.004,0.010,0.013,0.017,0.022)
>Abs=c(0.009,0.158,0.301,0.472,0.577,0.739)
>n=length(Conc)
>weights=StDev(-2)/mean(StDev(-2))
>wreg=lm(AbsConc,weights=weights)
>reg=lm(AbsConc)
>summary(wreg)
```

It is often convienent to express the regression analysis using ANOVA table. The following equation is the basis for such representation

It is often shortened to SST = SSLR + SSR; where SST is referred

to as the total sum of squares, SSLR is the sum of squares due to linear regression (within regression), SSR is the sum of squares due to residuals (outside regression).

2 Weighted Regression

Unweighted regression requires that the variability of the residuals is constant over the measured range of values. (This is called homoskedasticity).

Weighted regression does not have this requirement. There may be differing variability over the range of values. (This is called heteroskedasticity).

Weighted regression requires extra information on the standard deviations of the responses so as to compute the weights.

Unweighted regression doesnt need or use any information on the response standard deviations.

Weighted regression is preferable if heteroskedasticity evident in the data

(If there is not constant variance for the residuals over the range of values)

3 Weighted Regression

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