LOWESS ± SD

To obtain the lowess estimates lowess ± SD:

**Notation**: To distinguish estimates from parameters or true values, we'll use a hat (^) over estimates.

1. Smooth to get the lowess estimate \( \hat{E}(y|x) \) of \( E(y|x) \).

2. Let

\[
\hat{e}^2 = [y - \hat{E}(y|x)]^2 \quad \text{"squared residual"}
\]

It's an estimate of \([y - E(y|x)]^2\)

Recalling the definition of Var, we can consider

\[
E(\hat{e}^2|x)
\]

as an estimate of \( \text{Var}(y|x) \).

3. Use smoothing to get an estimate \( \hat{E}(\hat{e}^2|x) \) of \( E(\hat{e}^2|x) \)

4. SD = \( \sqrt{\hat{E}(\hat{e}^2|x)} \)