

Input: Values $(x_i, y_i)_{i=0}^{n-1}$, initial approximations for a_0 and a_1 from standard linear regression, relative precision ε

for $i = 0$ **to** $n - 1$ **do**

$r_i^{(0)} = y_i - (a_0 + a_1 x_i);$

end

$\widehat{\sigma} = 1.4826 \cdot \text{median}(|r_i^{(0)}|, r_i^{(0)} \neq 0);$

$k = 0;$

while $(\max_i |r_i^{(k+1)} - r_i^{(k)}| > \varepsilon \widehat{\sigma})$ **do**

for $i = 0$ **to** $n - 1$ **do**

$w_i = W(r_i^{(k)} / \widehat{\sigma});$ // $W(t)$ given by Eq. (6.21)

end

 Compute new estimates for a_0 and a_1 by solving the linear system

$$\begin{aligned} a_0 \sum_i w_i + a_1 \sum_i w_i x_i &= \sum_i w_i y_i \\ a_0 \sum_i w_i x_i + a_1 \sum_i w_i x_i^2 &= \sum_i w_i x_i y_i \end{aligned}$$

for $i = 0$ **to** $n - 1$ **do**

$r_i^{(k+1)} = y_i - (a_0 + a_1 x_i);$

end

$k = k + 1;$

end

Output: a_0, a_1 by the IRWLS method