The nonparametric estimator in Xiao's paper. (p.83, above Theorem 1)

$$\hat{\beta}(z) = \left[\frac{1}{nh}\sum_{t=1}^{T} x_t x_t' K\left(\frac{z_t - z}{h}\right)\right]^{-1} \frac{1}{nh}\sum_{t=1}^{T} x_t y_t K\left(\frac{z_t - z}{h}\right)$$

Given the data, please code up this estimator.

Naive idea: two loops. For each fixed z, do a loop from $t = 1$ to T for summation. Then go over each $z = z_i$.

two points of improvement

Vecotization: $\sum_{t=1}^{T} x_t x_t' K\left(\frac{z_t - z}{h}\right)$ can be written in matrix form as $X'K(z)X$.

plyr: save the book keeping in loops.