Hurst Exponent:

Since for poly. the degree is 1

$\Downarrow$

we need to find a linear relationship.

input (x): $\log(\text{lags}) = \log(\tau)$

output (y): $\log(\text{std}(\log(t+\tau) - \log(t)))$

we know:

$$\text{var}(\tau) \sim \tau^{2H}.$$

$\Downarrow$

$$(\text{std}(\tau))^2 \sim \tau^{2H}$$

$$\text{std}(\tau) \sim \tau^{H}$$

$$\log(\text{std}(\tau)) \sim H$$

$$\frac{\log(\text{std}(\tau))}{\log(\tau)} \sim H$$

fit a linear relationship!

$\downarrow$

$$\log(\text{std}(\tau)) \sim \log(\tau) \cdot H$$