

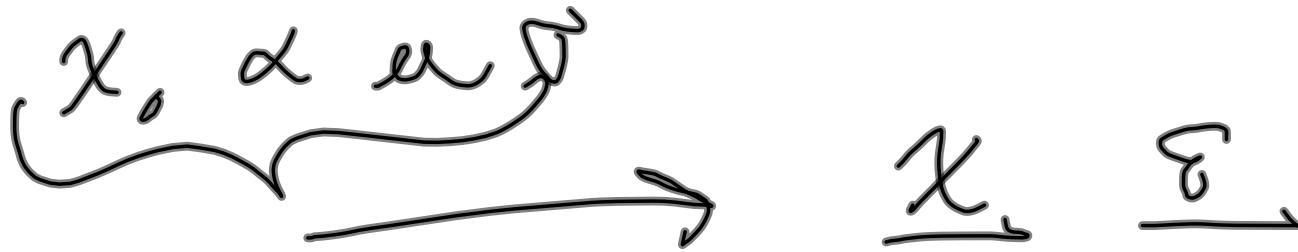
Classic Pop Dy
with age
Leslie matrix

$$\underline{n}_{t+1} = A \underline{n}_t$$
$$n_{0,t+1} = n_{0,t} b_0 + n_{1,t} b_1 + \dots$$

$$n_{0,t+1} = n_{0,t} \alpha_{0,t} + n_{0,t-1} \alpha_{1,t-1} + \dots + \varepsilon_{0,t}$$

Classic pure AR1

$$x_{t+1} = (x_t - \mu) \alpha + \mu + \varepsilon_t \sigma \sqrt{1 - \alpha^2}$$



1) Generate a \underline{x}
(Know true μ, σ)
or Get actual data set \underline{x}

2) $\hat{\mu}$ $\hat{\sigma}$ $\hat{\alpha}$
"point estimates"

3) Assume $\hat{\mu}$ $\hat{\sigma}$ $\hat{\alpha}$
are "true" and generate
new realizations of " \underline{x} "
(multiple times)

4) For each "x"

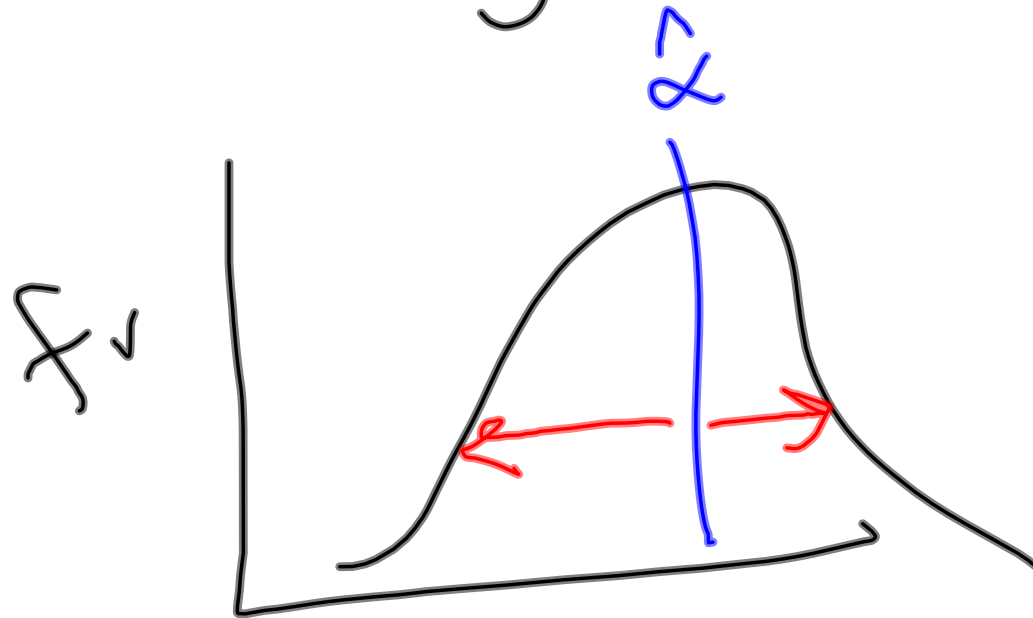
Fit point estimates

$\hat{\mu}$ $\hat{\sigma}$ $\hat{\alpha}$

5) Make histograms of

$\hat{\mu}$ $\hat{\sigma}$ $\hat{\alpha}$

a) Interpretation of histograms



" Bootstrap confidence interval
parametric bootstrap "

Non-parametric bootstrap

Resampling the actual data (with replacement)

Example:

Sample variance
is true variance

