week 7 ⟹ C.A

Non-Parametric Estimation

→ Only use the data to come up with the model

Data Driven Modelling

for a pdf

To learn about a
variable w/o making
assumptions on it

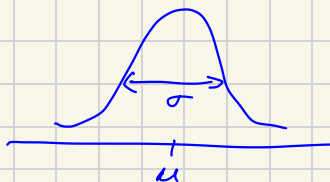for a model
$g(x,y)$

Section 4

To learn about a
pattern w/o making
assumptions on it

"Parametric" vs "Non-Parametric"

"Parametric" means we assume a shape or
structure to describe the data, up to a
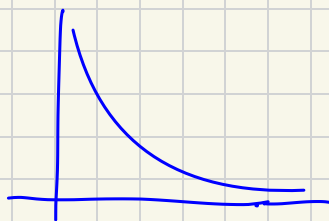finite number of parameters
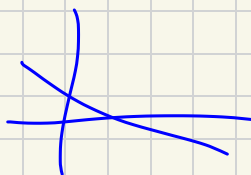
Ex1
$$x \sim N(\mu, \sigma^2)$$

Ex2
$$x \sim Exp(\mu)$$

<u>Ex 3</u>

Regression (= pattern) $\quad V = B_0 + B_1 X$

N.B $\quad$ In MLE: $\quad \hat{B} = \arg\max\limits_{B} \sum\limits_{i=1}^{N} \log L(r_i(B))$

$\quad$ Residuals $r_i(B) = y_i - Bx_i \quad$ (ex)

$\quad f(r) = N(0, \sigma^2) \quad \longrightarrow$ pdf of ε

<u>KDE'S</u>

Sample points $\rightarrow$ kernels $\quad (x_i)$

Scaling factor $\rightarrow$ h $\quad$ (bandwidth) (bw in R

$K\left(\dfrac{x - x_i}{h}\right) \quad \rightarrow$ K is the template dist^n

$\quad \hookrightarrow$ (i.e) normal, uniform etc