

Modely

Cíle

- Lineární modelování
- Interpretace modelu
- Nelineární model

Lineární regrese

- Trocha teorie...

$$y_i = \beta_0 + \beta_1 x_{i1} + \dots + \beta_p x_{ip} + \epsilon_i$$

- V praxi:

```
lm(závislá ~ nezávislá, data = ... )
```

Práce s modelem

- Shrnutí modelu: `summary(model)`
- Přehled reziduálů: `residuals(model)`
- Uplatnění modelu na nová data:
`predict(model, newdata = ...)`

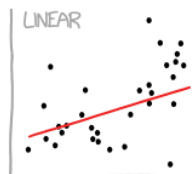
Nelineární model

- Když na základě dobré teorie vím, že závislost je jiná než lineární (tj. vím jaká, a vím proč)

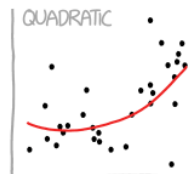
$$y_t = x_0(1+r)^t$$

```
nls(zavisla ~ pocatek * (1 + r)^t,  
    data = dataset,  
    start = list(a = 1, r = .01))
```

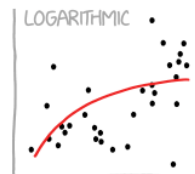
CURVE-FITTING METHODS AND THE MESSAGES THEY SEND



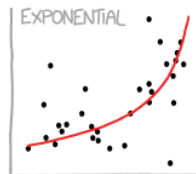
"HEY, I DID A
REGRESSION."



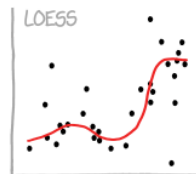
"I WANTED A CURVED
LINE, SO I MADE ONE
WITH MATH."



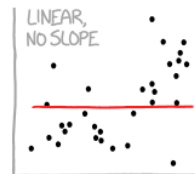
"LOOK, IT'S
TAPERING OFF!"



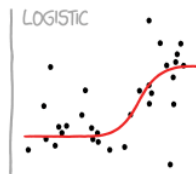
"LOOK, IT'S GROWING
UNCONTROLLABLY!"



"I'M SOPHISTICATED, NOT
LIKE THOSE BUMBLING
POLYNOMIAL PEOPLE."



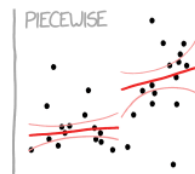
"I'M MAKING A
SCATTER PLOT BUT
I DON'T WANT TO."



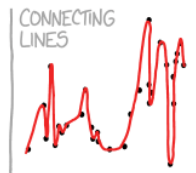
"I NEED TO CONNECT THESE
TWO LINES, BUT MY FIRST IDEA
DIDN'T HAVE ENOUGH MATH."



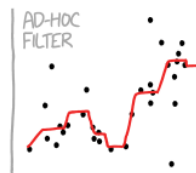
"LISTEN, SCIENCE IS HARD.
BUT I'M A SERIOUS
PERSON DOING MY BEST."



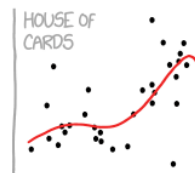
"I HAVE A THEORY,
AND THIS IS THE ONLY
DATA I COULD FIND"



"I CLICKED 'SMOOTH
LINES' IN EXCEL."



"I HAD AN IDEA FOR HOW
TO CLEAN UP THE DATA.
WHAT DO YOU THINK?"



"AS YOU CAN SEE, THIS
MODEL SMOOTHLY FITS
THE- WAIT NO NO DON'T
EXTEND IT AAAAAA!!"