$$\text{duration} = -\frac{1}{P}\frac{dP}{dy} = \frac{-\Delta P/P}{\Delta y}$$

P – price
y – yield

motivation: ~~bon~~ \$1000 in bond portfolio
3y duration, yield of 3%

what if yield/interest rates go down? (bad economy)
→ NPV / price ↗

if yield goes to 2%:

$$\Delta y = -1\%$$

$$\frac{\Delta P}{P} = -\text{duration} \cdot \Delta y = +3\%$$

⇒ ~~new~~ gain of \$30 value goes to \$1030

~~Zero coupon bond~~:

sense of size duration

zero coupon bond duration $\leq m$ (of maturity m)