# EQUATIONS FOR PYDATA BERLIN

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$$E[U] = u_{TP} * TPR * r_p \ + \ u_{FN} * (1 - TPR) * r_p + \\ u_{FP} * FPR * r_n \ + \ u_{TN} * (1 - FPR) * r_n$$

$$r_n = \frac{N}{N + P}$$

$$r_p = \frac{P}{N + P}$$

It makes a line
Maybe two

$$TPR = m * FPR + b$$

$$m = \frac{u_{TN} - u_{FP}}{u_{TP} - u_{FN}} * \frac{r_n}{r_p}$$

$$b = \frac{E[U] - u_{FN} * r_p - u_{TN} * r_n}{(u_{TP} - u_{FN}) * r_p}$$

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$$b = \frac{E[U] - u_{FN} * r_p - u_{TN} * r_n}{(u_{TP} - u_{FN}) * r_p}$$

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