Lecture 19: Data fitting

We want to find the best linear fit through the points $(1,0),(2,1),(3,3)$.

$$\begin{aligned} 1r + 1s &= 0 \\ 2r + 1s &= 1 \\ 3r + 1s &= 3 \end{aligned}$$

$\vec{x} = (a,b)$. The best solution $\vec{x}^*$ to $A\vec{x} = \vec{b}$. is $\vec{x}^* = (A^T A)^{-1} A^T \vec{b}$.

1 Write down A, A^T.

2 What is $\vec{b}$ and $A^T\vec{b}$.

3 Find $(A^T A)$ and its inverse.

4 Compute $\vec{x}^* = (A^T A)^{-1} A^T \vec{b}$

5 What line $rx + s$ fits best the data?