8b

$$A = \begin{bmatrix} 1 & 20 \\ 1 & 30 \\ 1 & 40 \\ 1 & 60 \\ 1 & 70 \\ 1 & 90 \\ 1 & 100 \\ 1 & 120 \\ 1 & 150 \\ 1 & 180 \end{bmatrix}, \quad \vec{b} = \begin{bmatrix} 3.5 \\ 7.4 \\ 7.1 \\ 15.6 \\ 11.1 \\ 14.9 \\ 23.5 \\ 27.1 \\ 22.1 \\ 32.9 \end{bmatrix}, \quad \vec{z} = \begin{bmatrix} a_0 \\ a_1 \end{bmatrix}$$

$$y = a_0 + a_1 x$$

$$A^T A = \begin{bmatrix} 10 & 860 \\ 860 & 98800 \end{bmatrix} \qquad A^T \vec{b} = \begin{bmatrix} 165.80 \\ 19469 \end{bmatrix}$$

$$A\vec{z} = \vec{b} \longrightarrow \cdots$$

$$A^T A \vec{z} = A^T \vec{b}$$

$$\cdots \longrightarrow \vec{z} = (A^T A)^{-1} A^T \vec{b} = \begin{bmatrix} 1.7650 \\ 0.17157 \end{bmatrix}$$

$$\boxed{y = 1.7650 + 0.17157\,x}$$

EVERYTHING COMPUTED IN MATLAB