

$$A \text{ } m \times n \quad \underline{b} \in \mathbb{R}^n$$

$$\underline{v} = A\underline{b} = \underline{b_1 a_{11}} + \underline{b_2 a_{12}} + \dots + \underline{b_n a_{1n}} \in \mathbb{R}^m$$

$$= \begin{bmatrix} b_1 a_{11} \\ b_1 a_{21} \\ \vdots \\ b_1 a_{m1} \end{bmatrix} + \begin{bmatrix} b_2 a_{12} \\ b_2 a_{22} \\ \vdots \\ b_2 a_{m2} \end{bmatrix} + \dots + \begin{bmatrix} b_n a_{1n} \\ b_n a_{2n} \\ \vdots \\ b_n a_{mn} \end{bmatrix}$$

$$= \begin{bmatrix} (1.\text{r\ddot{o}dke i } A) \cdot \underline{b} \\ (2.\text{r\ddot{o}dke i } A) \cdot \underline{b} \\ \vdots \\ (m.\text{r\ddot{o}dke i } A) \cdot \underline{b} \end{bmatrix}$$

$$\underline{v_j} = (\underline{j}.\text{r\ddot{o}dke i } A) \cdot \underline{b}$$

Exo

$$\begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 4 & 7 & 1 \end{pmatrix} \begin{pmatrix} -1 \\ 2 \\ -3 \\ 1 \end{pmatrix} = \begin{bmatrix} -1 + 4 - 9 + 1 \\ -3 + 8 - 21 + 1 \end{bmatrix} = \begin{bmatrix} -2 \\ -1 \end{bmatrix}$$

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$$= \begin{bmatrix} b_1 a_{11} \\ b_1 a_{21} \\ \vdots \\ b_1 a_{m1} \end{bmatrix} + \begin{bmatrix} b_2 a_{12} \\ b_2 a_{22} \\ \vdots \\ b_2 a_{m2} \end{bmatrix} + \dots + \begin{bmatrix} b_n a_{1n} \\ b_n a_{2n} \\ \vdots \\ b_n a_{mn} \end{bmatrix}$$

$$= \begin{bmatrix} (1.\text{række i } A) \cdot \underline{b} \\ (2.\text{række i } A) \cdot \underline{b} \\ \vdots \\ (m.\text{række i } A) \cdot \underline{b} \end{bmatrix}$$

$$v_j = (j.\text{række i } A) \cdot \underline{b}$$

Eks

$$\begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 4 & 7 & 1 \end{pmatrix} \begin{pmatrix} -1 \\ 2 \\ -3 \\ 1 \end{pmatrix} = \begin{bmatrix} -1 + 4 - 9 + 1 \\ -3 + 8 - 21 + 1 \end{bmatrix} = \begin{bmatrix} -2 \\ -14 \end{bmatrix}$$