

XCS224N Assignment #1 Extra Credit: Understanding SVD

Antoine Ledoux
antoine.ledoux45@gmail.com

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1 Question 1

Suppose we have a matrix $\mathbf{A} \in \mathbb{R}^{n \times d}$ with SVD $\mathbf{A} = \mathbf{U}\mathbf{D}\mathbf{V}^T$, where $\mathbf{U} \in \mathbb{R}^{n \times r}$, $\mathbf{D} \in \mathbb{R}^{r \times r}$, $\mathbf{A} \in \mathbb{V}^{d \times r}$

Let's express \mathbf{U} and \mathbf{V} in terms of their columns vectors \mathbf{u}_i and \mathbf{v}_i respectively.

We have $\mathbf{U} = [\mathbf{u}_1 \dots \mathbf{u}_n]$