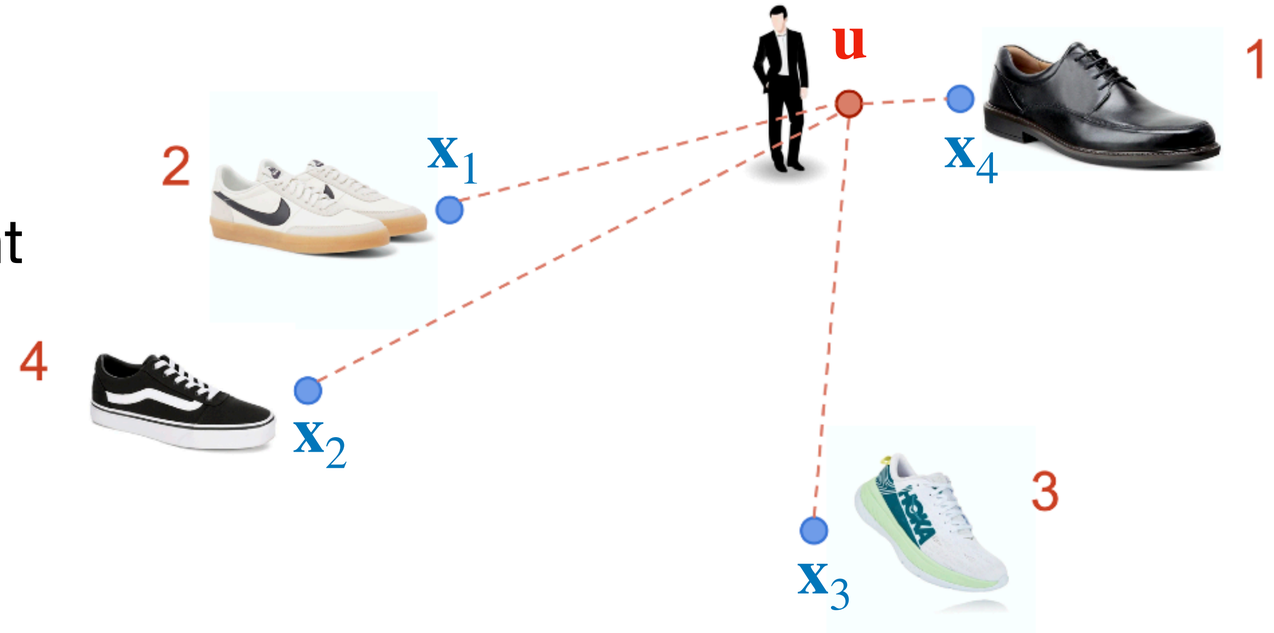
Distance-based preference models

- Items $\mathbf{x}_1, \ldots, \mathbf{x}_N \in \mathbb{R}^D$
- User's *ideal point* $\mathbf{u} \in \mathbb{R}^D$
- The closer an item $\mathbf{x}_i$ is to ideal point $\mathbf{u}$ under *some distance metric,* the more preferred $\mathbf{x}_i$ is.
- ***Goal:*** Estimate unknown $\mathbf{u}$
  - Existing work (e.g., [3, 4, 5]): ***standard Euclidean*** metric



Implicit assumptions of Euclidean distance

Features considered in isolation

Price vs. Price
Color vs. Color
Weight vs. Weight
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Feature importance equally weighted

Price and shoelace length are equally important to me