Lesson Plan 3/1

Wednesday, February 28, 2018 11:12 PM

Admin:
- We'll go over midterm on Tuesday
- Project 1 released (discussed shortly) Due 3/14

HDSC:
- Another podcast (via Marine C.): http://www.thetalkingmachines.com/episodes

Project 1
- Go over project description
- Questions and comments

Entity Resolution and Record Linkage

Exploratory Data Analysis (via visualization)

Record Linkage

Given: Entity sets E_1, E_2

Goal: Match linked entities (e_1, e_2)

$e_1 \in E_1$, $e_2 \in E_2$

1) Define a similarity function $s(e_1, e_2)$

→ additive function

$$S(e_1, e_2) = \sum_{j \in A} s_j(e_{1j}, e_{2j})$$

A: set of shared attributes

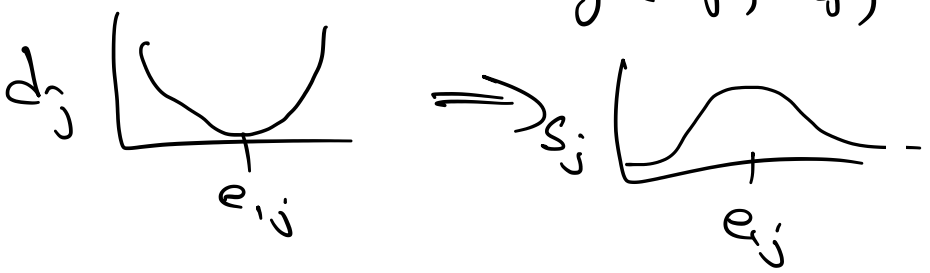
- Categorical variable:

$$s_j(e_{1j}, e_{2j}) = \begin{cases} 1 & \text{if } e_{1j} = e_{2j} \\ 0 & \text{o.w.} \end{cases}$$

- Numerical variables:

$$d_j(e_{1j}, e_{2j}) = (e_{1j} - e_{2j})^2$$

$$S_j(e_{1j}, e_{2j}) = e^{-d_j}$$



2) Compute $S_j(e_1, e_2)$ $\forall$ $e_1 \in E_1$, $e_2 \in E_2$

3) Match e_1, e_2 based on similarity $S_j(e_1, e_2)$

Assumption 1) each e_1 matches to a single e_2, e_2 can match to multiple e_1

Match e_1 to

$\underset{e_2}{\text{argmax}}\ s(e_1, e_2)$

Assumption 2) One-to-one mapping

Matching problem (451)

4) (optional) Don't match e_1 if

$\max_{e_2} s(e_1, e_2)$ is too small

Exploratory Data Analysis

→ Visualization
→ Summary statistics

Understanding the distribution of attribute values in an entity set

- Central tendency
- spread
- skew
- outliers