Day 4: Text Analysis

Relevant Terms

using TF-IDF

Intuition

- Count # times each word is used **TF**

We are in the process of trying to arrange a conference call with you on either Tuesday or Wednesday of next week to discuss the paper which is attached

We will be doing this by conference call and once we set a time to talk with you, will give you the number to call.

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conference: 2

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to: 4

Intuition

- Count # times each word is used **TF**
- Penalize if most documents use word **IDF**

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to: 4 ← Want to penalize

IDF. How do they work?

log(total # emails / # emails with word)

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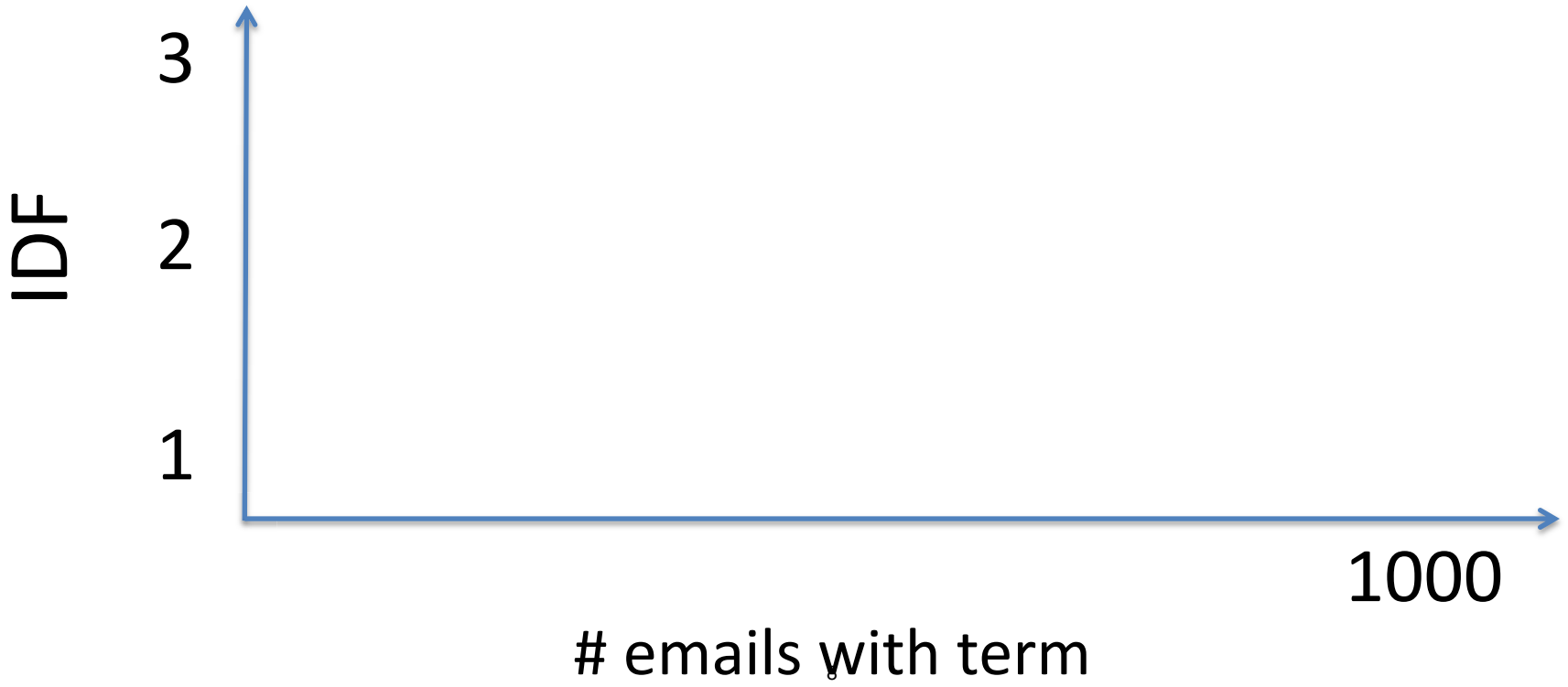

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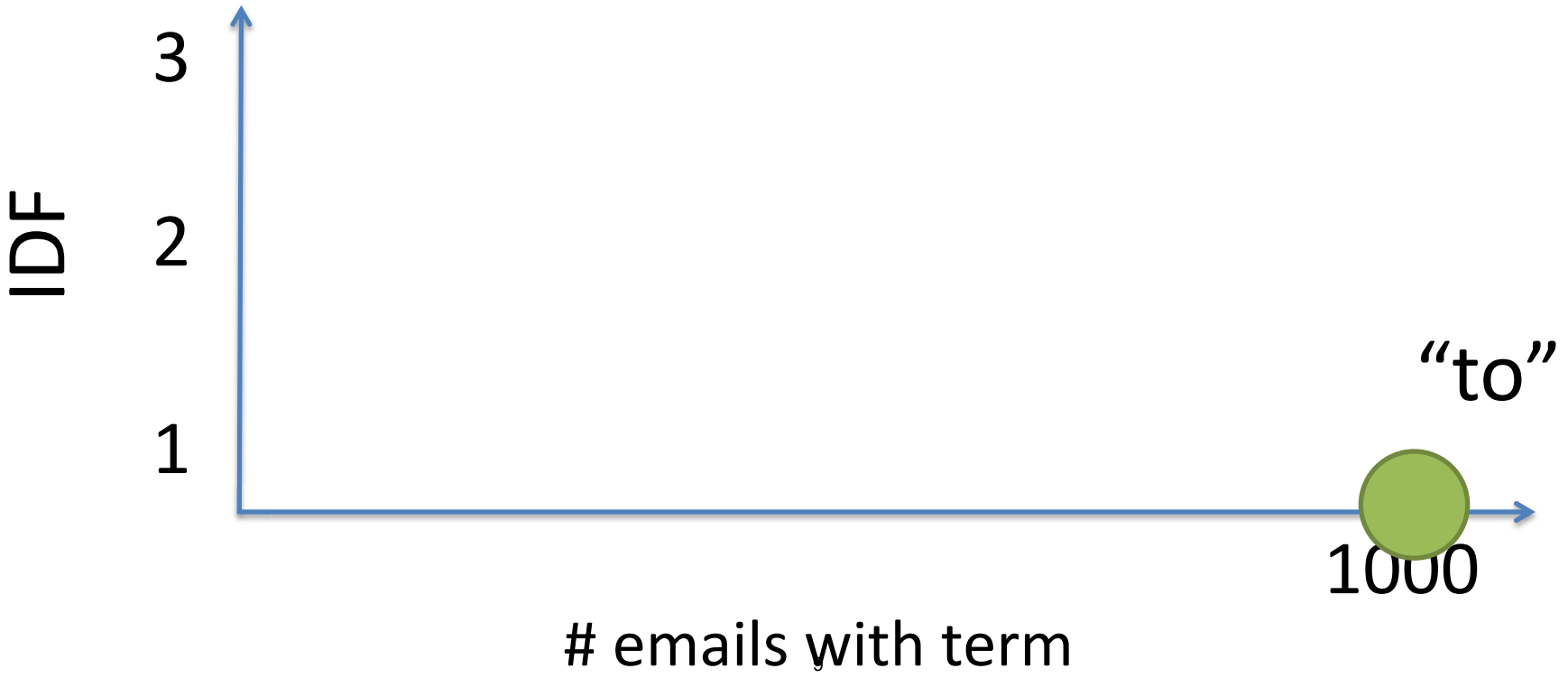

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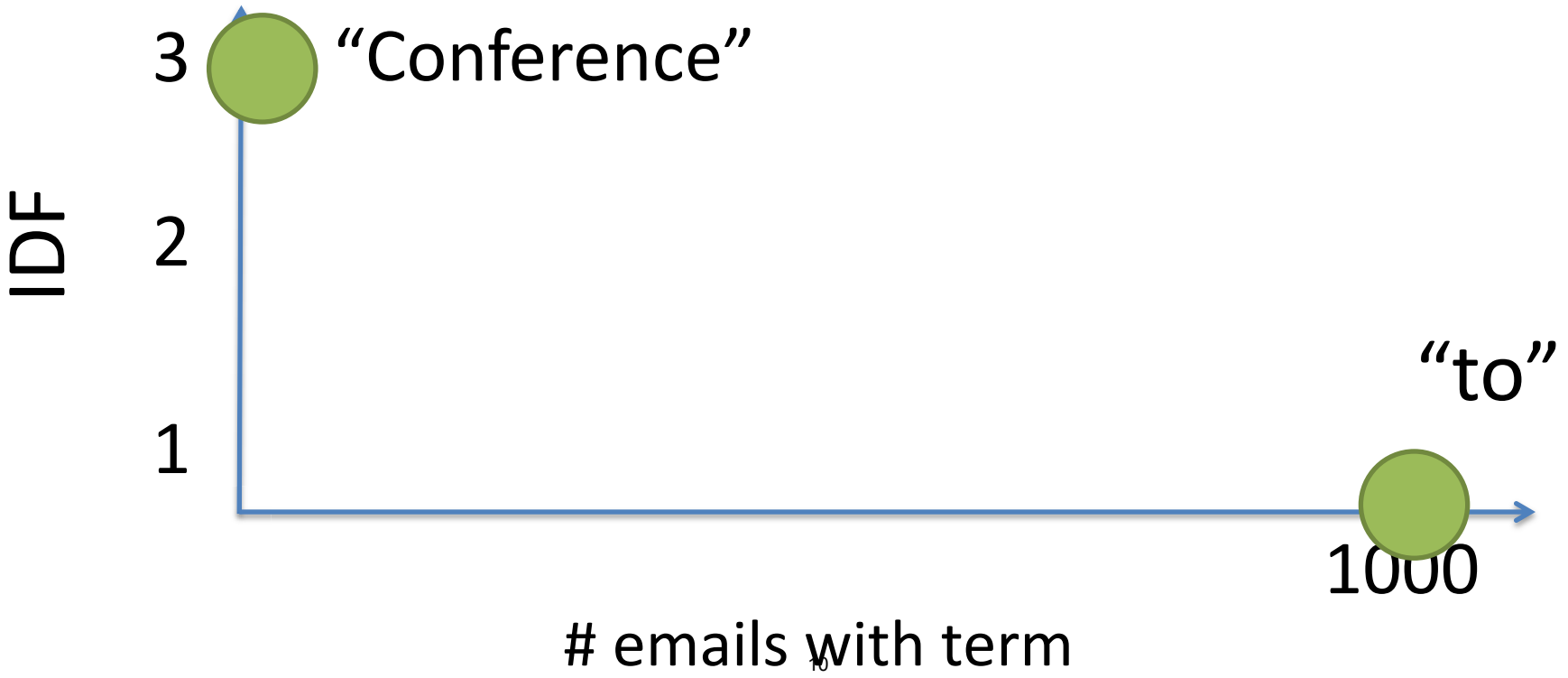

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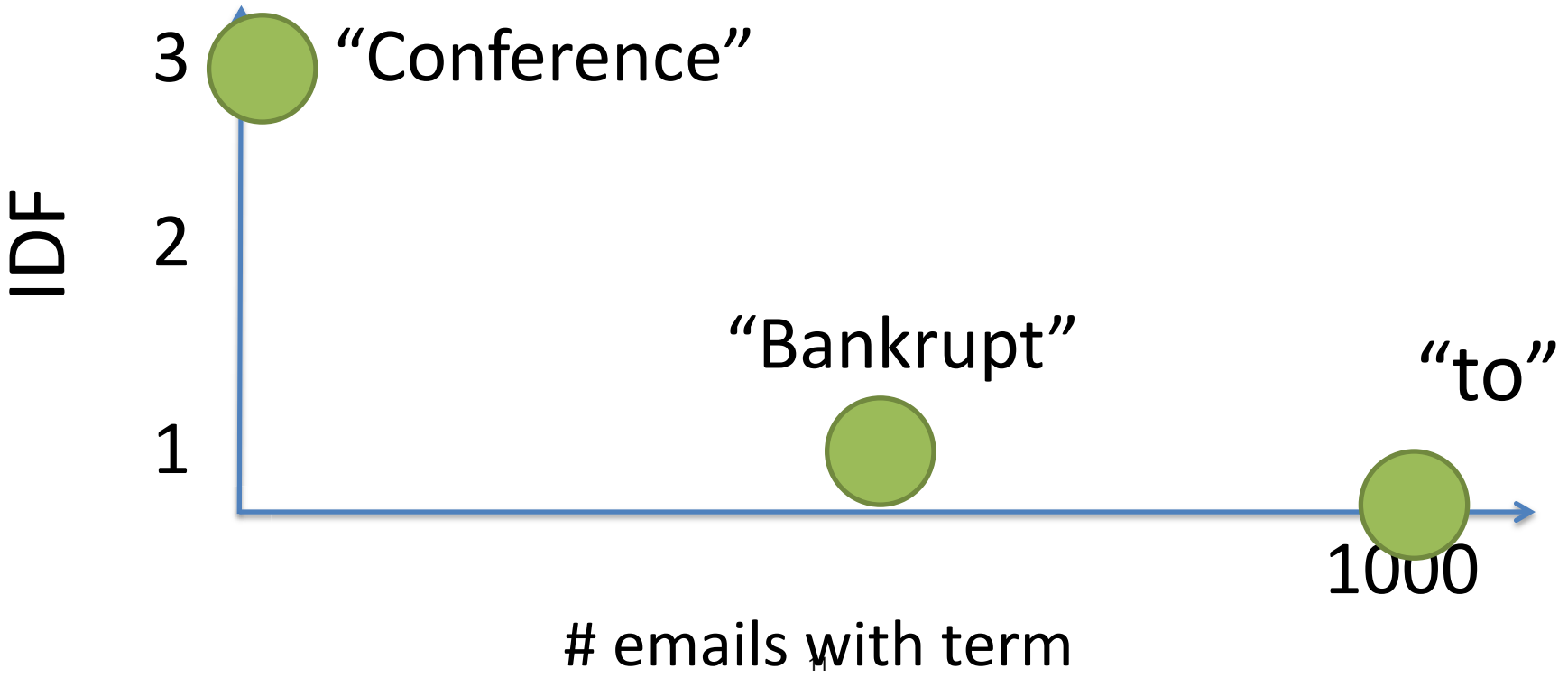

Relevant Terms

Frequent
Words in email

But not in all
emails

Relevant Terms

Frequent Words in email

But not in all emails

TF * IDF

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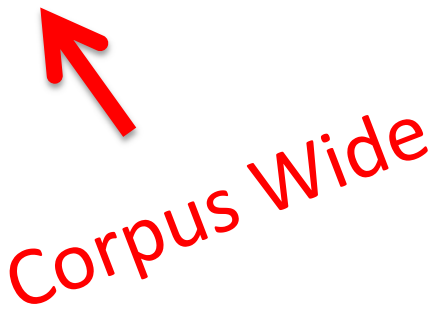

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	TFIDF
conference	4.1
call	3
…	
to	0.03
a	0.0012

How similar is email 1 to email 2?

Cosine Similarity

Email1 = conference, enron, donuts,…

Email2 = enron, call, appointment,…

Email1 = conference, **enron**, donuts,…

Email2 = **enron**, call, appointment,…

$$\text{Email1} \cap \text{Email2}$$

Email1 = conference, **enron**, donuts,…

Email2 = **enron**, call, appointment,…

$$\frac{\text{Email1} \cap \text{Email2}}{\#\text{ words in both emails}}$$

$$\frac{Email1 \bullet Email2}{||Email1|| * ||Email2||}$$

```
E1 = {‘conference’:4,  ‘enron’:3}
E2 = {‘enron’: 1,      ‘call’:2}
```

```
E1 = {‘conference’:4,  ‘enron’:3}
E2 = {‘enron’: 1,      ‘call’:2}

    E1[‘enron’] * E2[‘enron’] + …
```

E1 = {‘conference’:4, ‘enron’:3}

E2 = {‘enron’: 1, ‘call’:2}

$$\frac{E1[\text{‘enron’}] * E2[\text{‘enron’}] + \ldots}{\text{sqrt}(4^2+3^2) * \text{sqrt}(1^2+2^2)}$$

E1 E2

Resource: How to Process, Analyze and Visualize Data

Adam Marcus and Eugene Wu