

# Finding new friends

A different kind of recommendation system



airbnb

What are Seattle hosts like?



[View Photos](#)



Elena & AJ

## Whimsical Studio in Prime Location

Seattle, WA, United States ★★★★★ 88



Entire home/apt



2 Guests



Studio



1 Bed

## Your Host

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### Elena & AJ

Seattle, Washington, United States · Joined in May 2011

I'm a local Leasing Agent in Seattle & run a leasing company in town with my partner AJ. We love to travel and host folks from all around the nation & world. I discovered the AirBnB community a few years ago and fell in love! We have hosted & met so many amazing people through this community - I'm always excited for our next guest or trip!

I grew up in Novosibirsk, Russia & Vancouver, BC. I used to do competitive Ballroom all through my childhood and teen years. I still love to dance but lately I have taken up capoeira & acro yoga.

[+ More](#)

Response rate: **100%**

Response time: **within an hour**

678

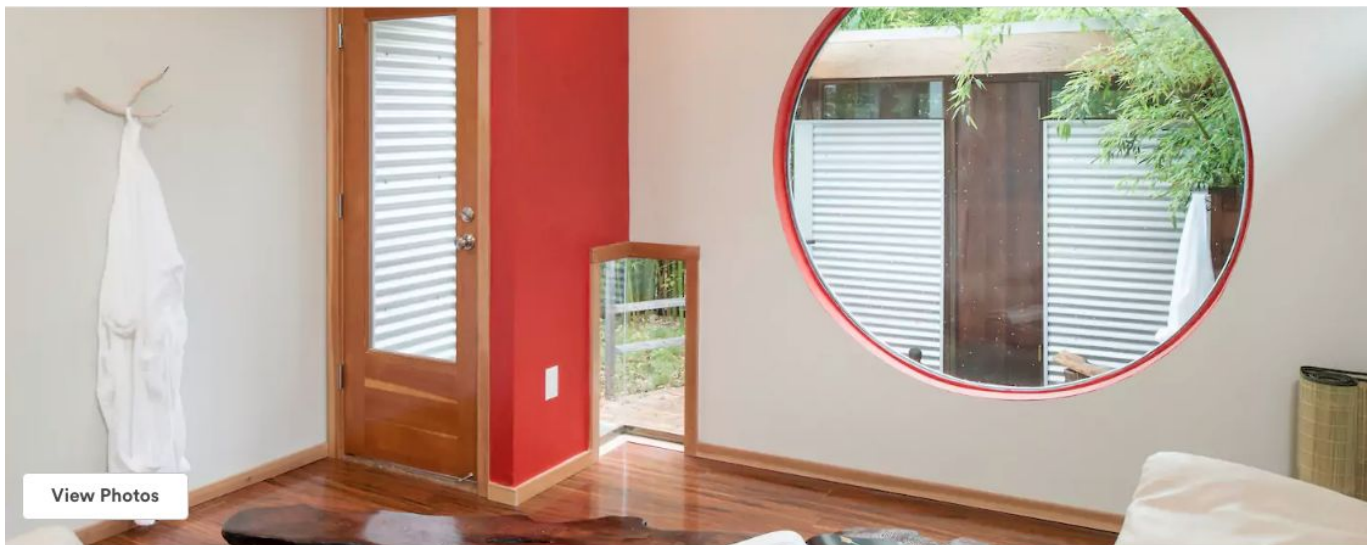
Reviews



Verified

Contact host

---



View Photos



Jeffrey

## Spa retreat in vibrant Greenwood

Seattle, WA, United States ★★★★★ 111



Entire home/apt



6 Guests



1 Bedroom



4 Beds

## Your Host

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### Jeffrey

Seattle, Washington, United States · Joined in July 2014

My wife Ellen and I moved to Seattle from Minneapolis in 1989--so we pretty much say we are from Seattle at this point. I am a residential architect and builder. We bought a tiny house in the early nineties and we have been developing into our dream home in the city.

We love to road trip in our vintage vw bus, ride horses, sail, and spend as much time as possible outdoors.

Response rate: **100%**

Response time: **within an hour**

115

Reviews



Verified

Contact host

---

Sounds like topic modeling.



# Non-negative Matrix Factorization

$$V = W \times H$$

Non-negative Matrix Factorization

$$V = W \times H$$

$$V = W \times H$$

Word-document  
matrix

$$V = W \times H$$

Word-document  
matrix

Word-feature  
matrix

$$V = W \times H$$

Word-document  
matrix

Word-feature  
matrix

Feature-document  
matrix


Word-document  
matrix

$\approx$


Word-feature  
matrix

**X**


Feature-document  
matrix

# Latent Dirichlet Allocation



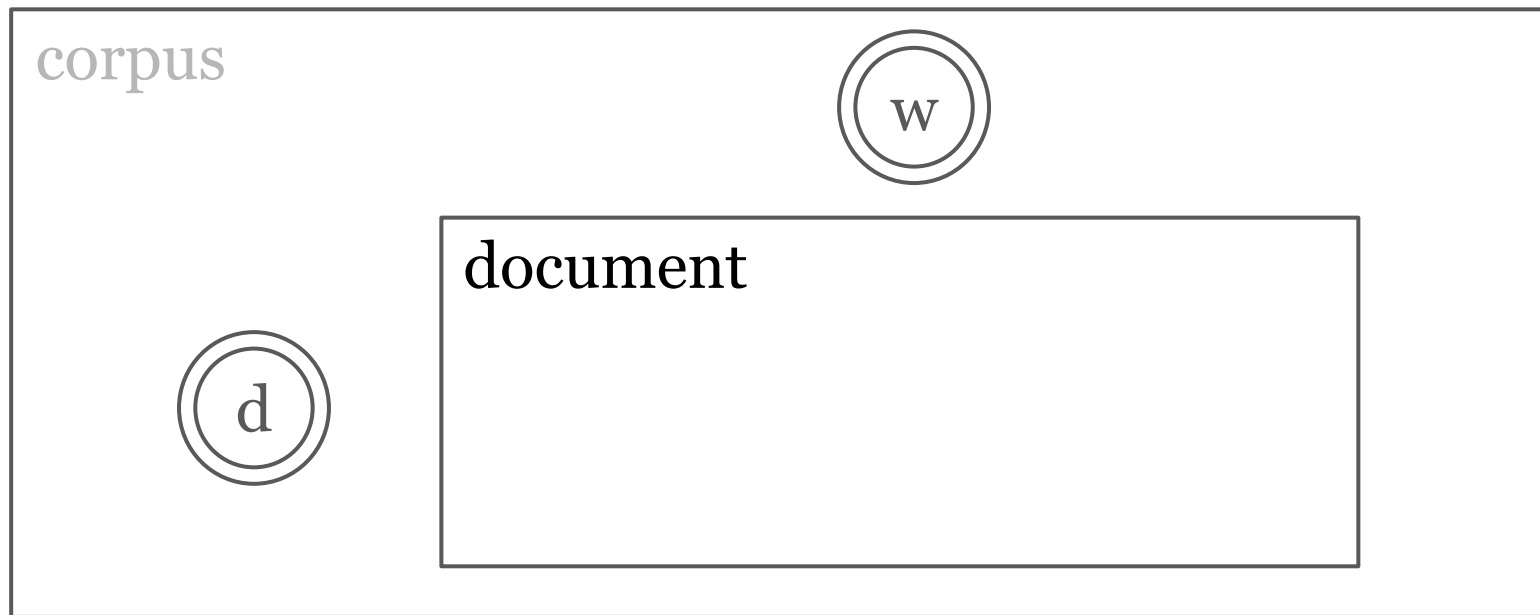
corpus

# Latent Dirichlet Allocation

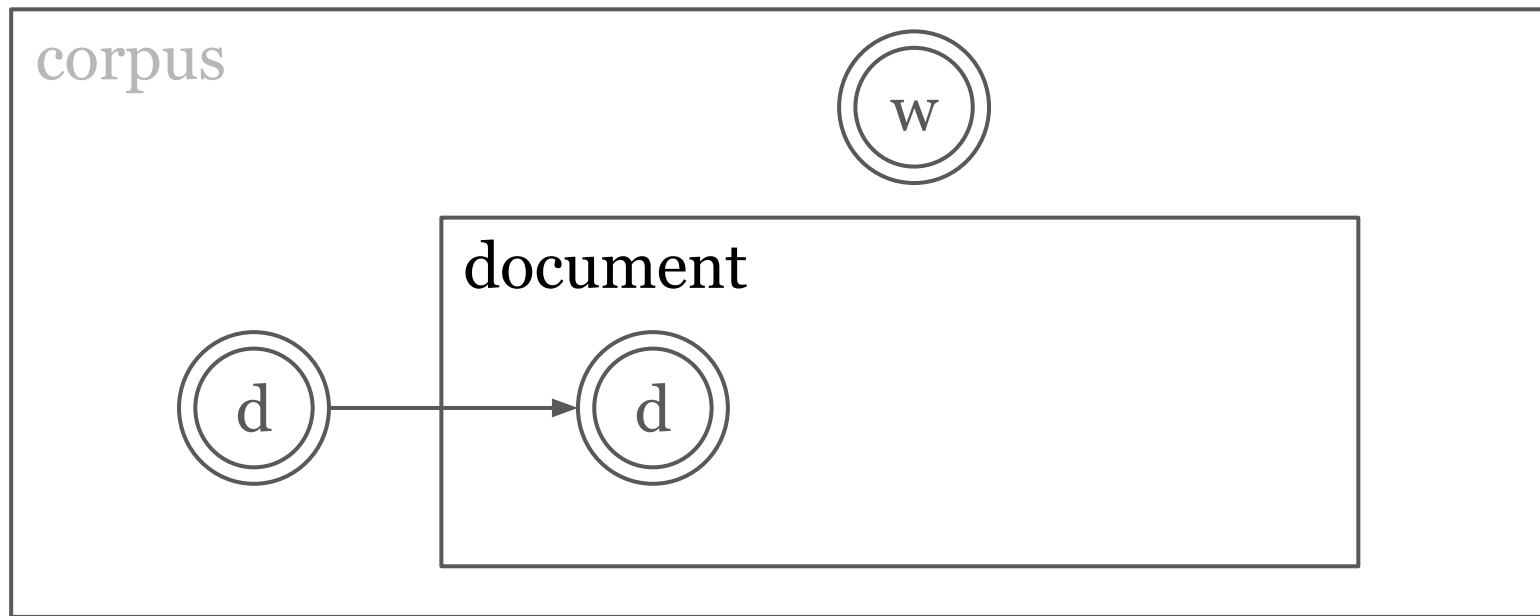
corpus



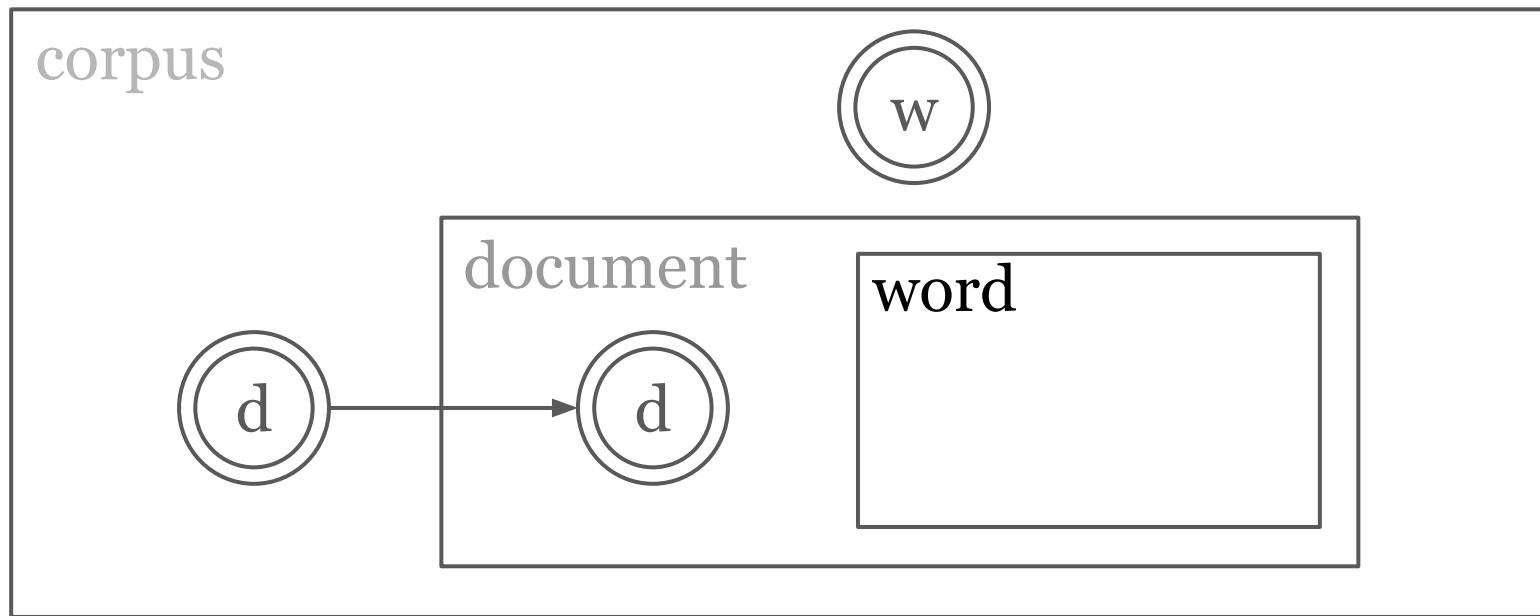
Latent Dirichlet Allocation



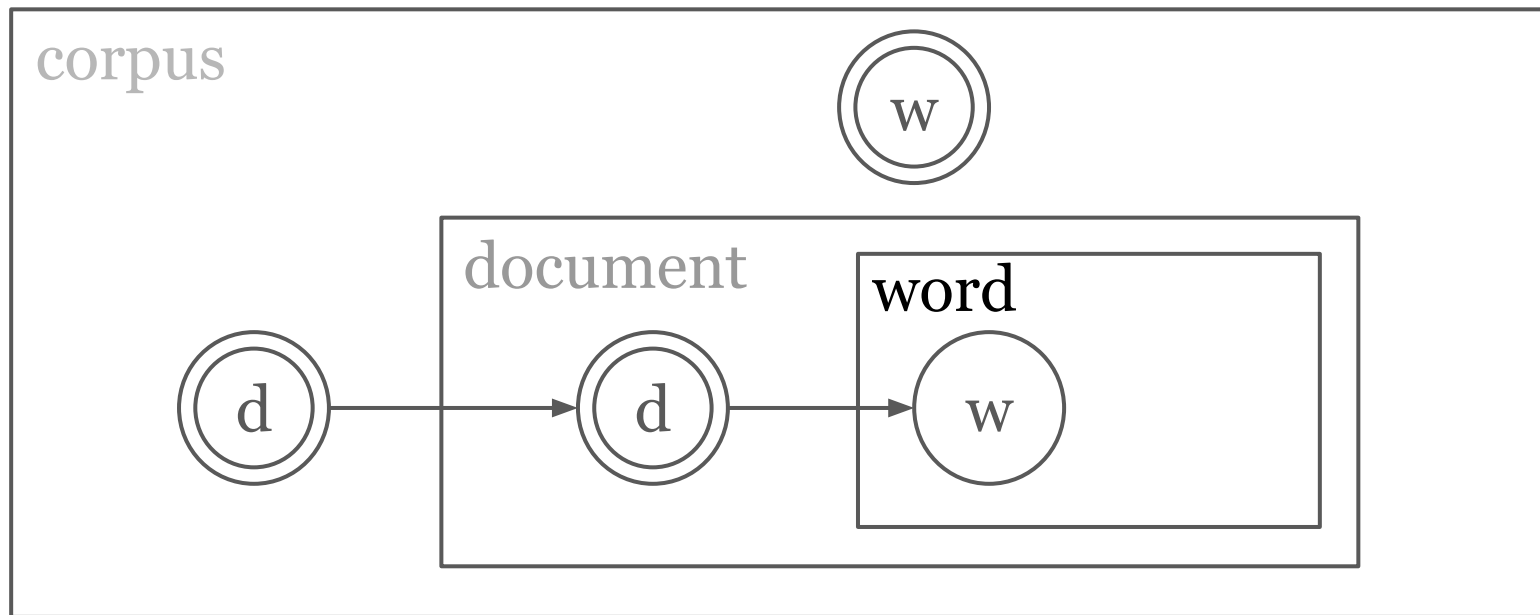
# Latent Dirichlet Allocation



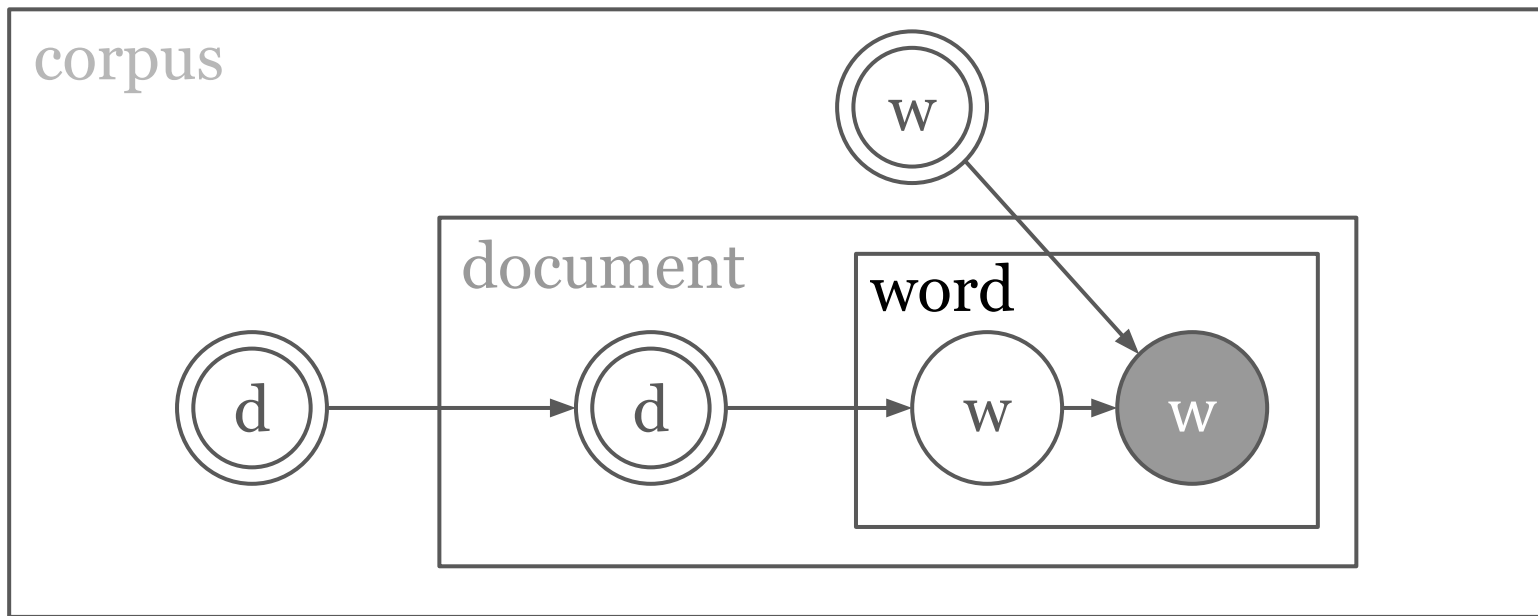
# Latent Dirichlet Allocation



# Latent Dirichlet Allocation



# Latent Dirichlet Allocation



# Latent Dirichlet Allocation

Deterministic

NMF

Stochastic

LDA



What is

NMF

What might be

LDA

The specifics.

2,000 documents, lemmatized

2,000 documents, lemmatized  
Unigrams

2,000 documents, lemmatized  
Unigrams  
Bigrams

2,000 documents, lemmatized

Unigrams

Bigrams

At least 3 documents

2,000 documents, lemmatized  
Unigrams  
Bigrams  
+ At least 3 documents

---

$$\begin{array}{r} 2,000 \text{ documents, lemmatized} \\ \text{Unigrams} \\ \text{Bigrams} \\ + \text{ At least 3 documents} \\ \hline 4,300 \text{ unique tokens} \end{array}$$



12 topics\*

12 topics\*

*\*Some assembly required*

food  
music  
art  
dance  
wine  
yoga

NMF

LDA

artsy

NMF

LDA

NMF

yoga  
artist  
practice  
cup  
respectful  
earth  
mother

LDA

hippies

NMF

LDA

NMF

anywhere  
found  
locate  
bar  
restaurant  
bustle

LDA

NMF

?

LDA



Outdoorsy

NMF

Outdoorsy

LDA

hike  
outdoors  
ski  
bike  
sport  
camp  
run

NMF

hike  
bike  
art  
play  
music  
ski  
camp

LDA

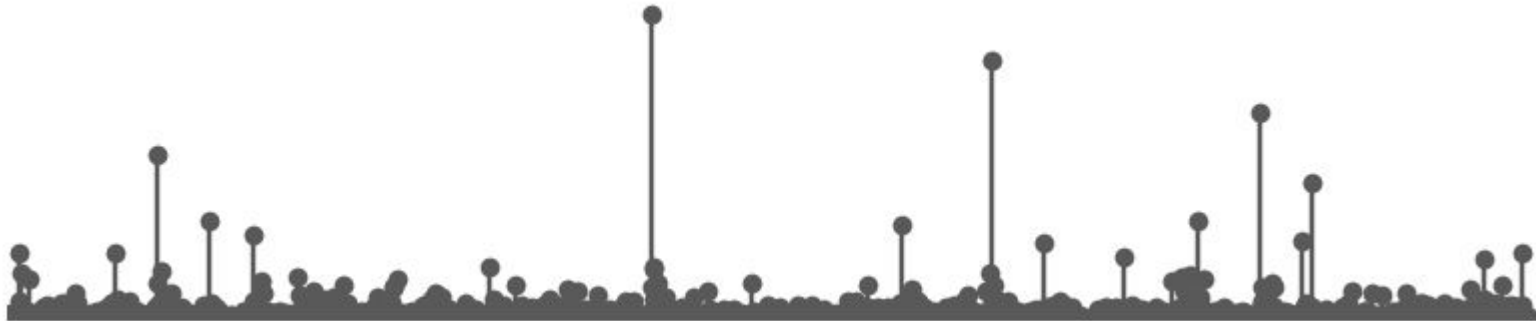
hike  
outdoors  
ski  
bike  
sport  
camp  
run

NMF

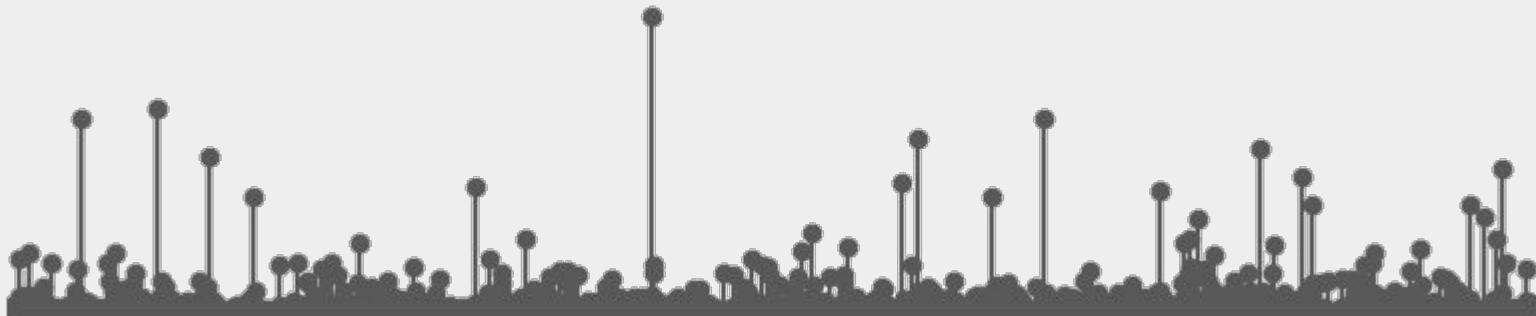
hike  
bike  
art  
play  
music  
ski  
camp

LDA

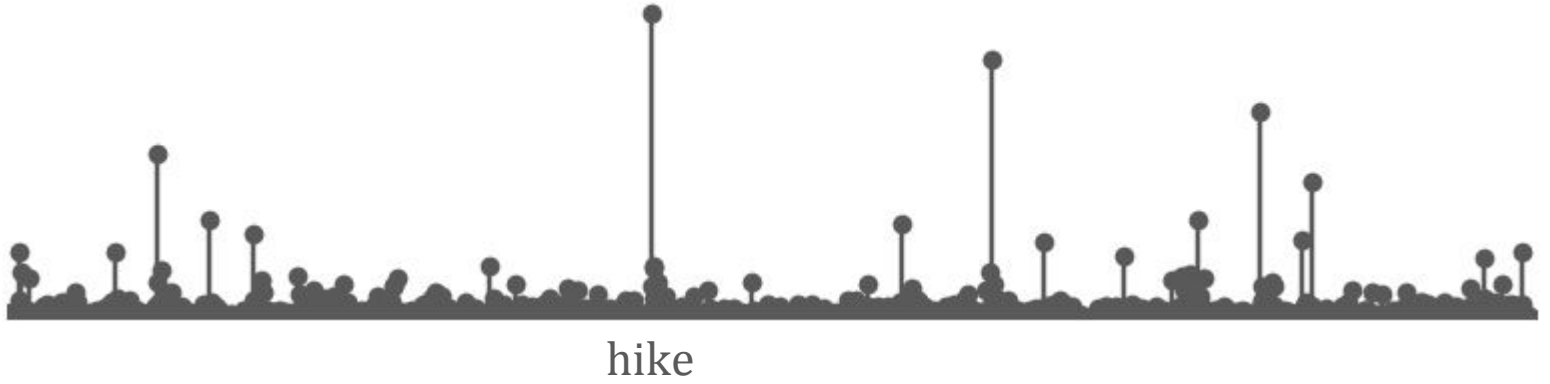
NMF



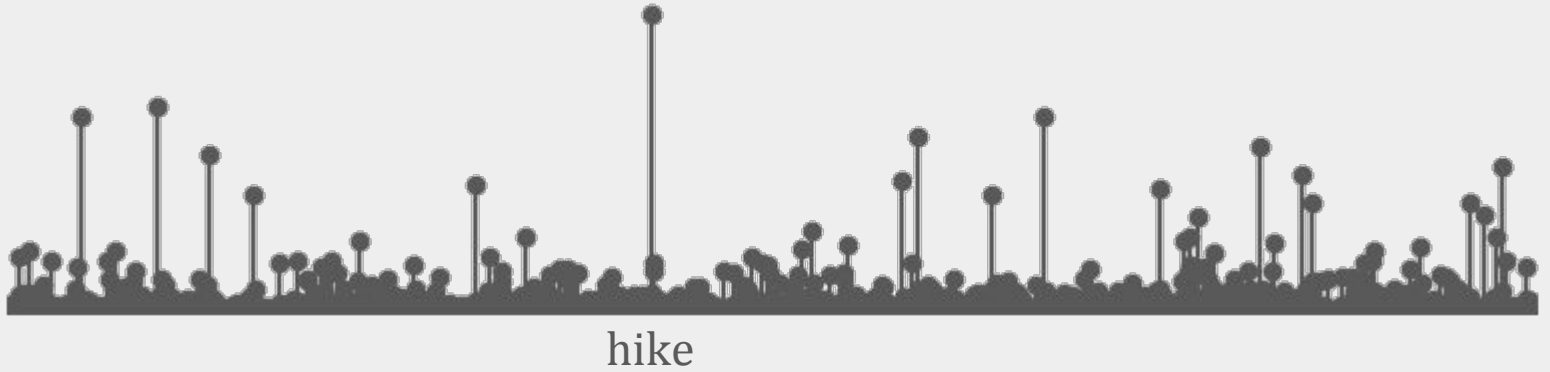
LDA



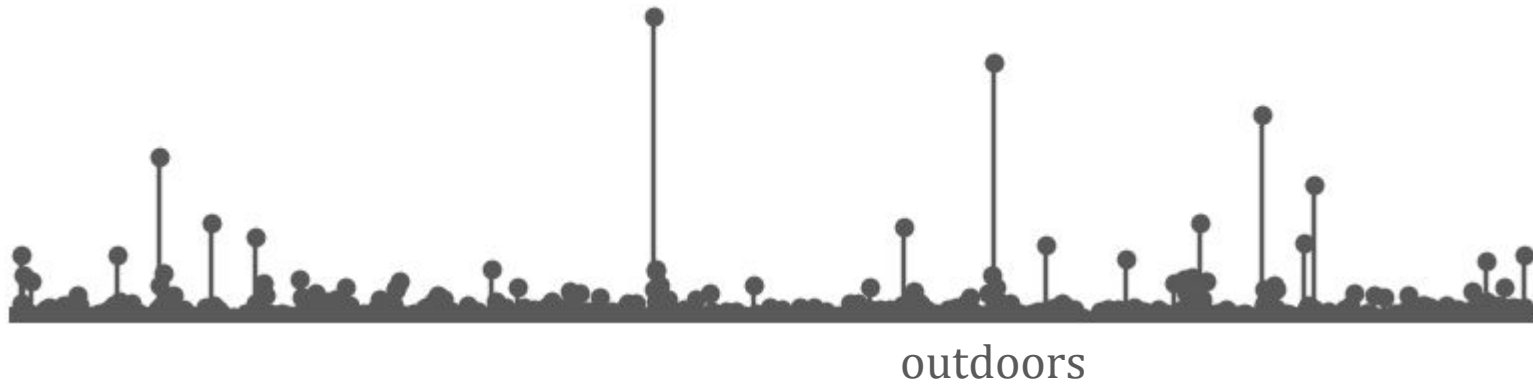
# NMF



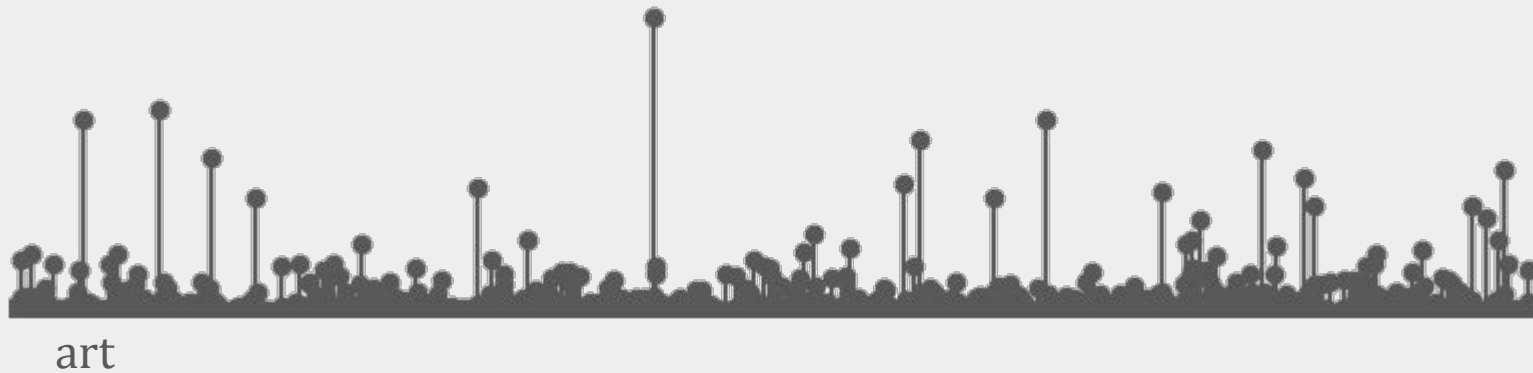
# LDA



# NMF



# LDA



Professional

NMF

Professional

LDA

young professional  
business  
meeting  
company  
working  
technology

NMF

young professional  
northwest  
business  
trail  
beauty  
Puget Sound

LDA



young professional  
business  
meeting  
company  
working  
technology

NMF

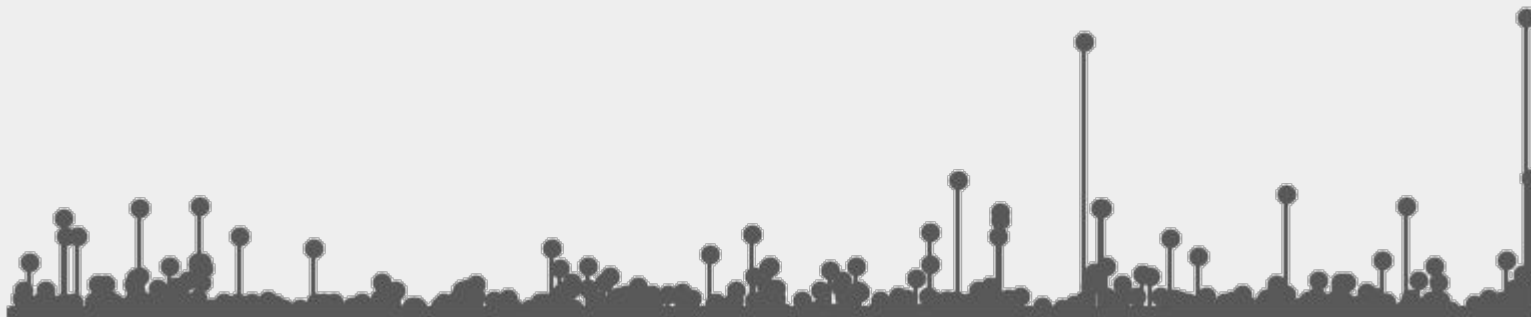
young professional  
**northwest**  
business  
**trail**  
beauty  
**Puget Sound**

LDA

NMF



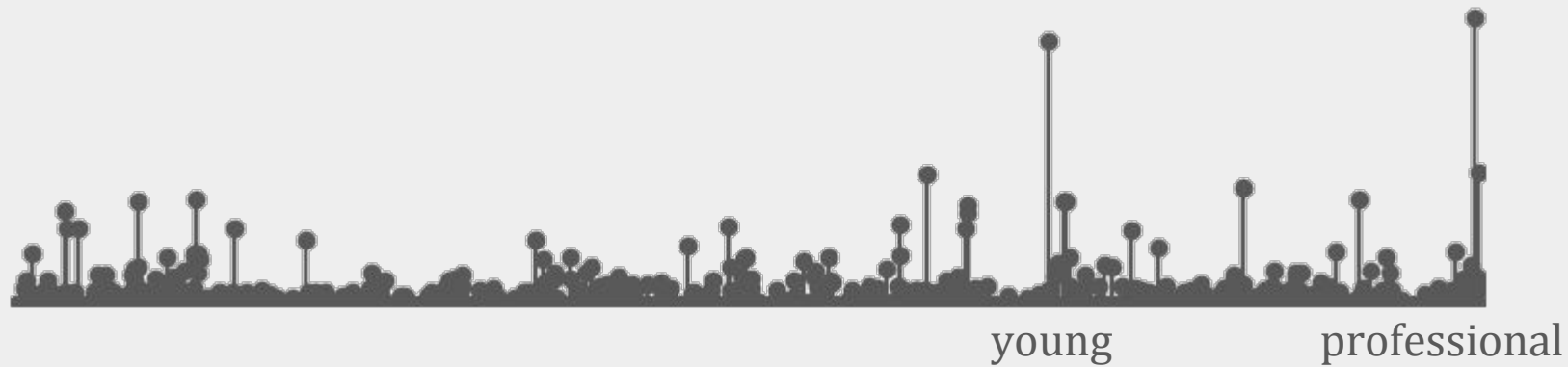
LDA



NMF



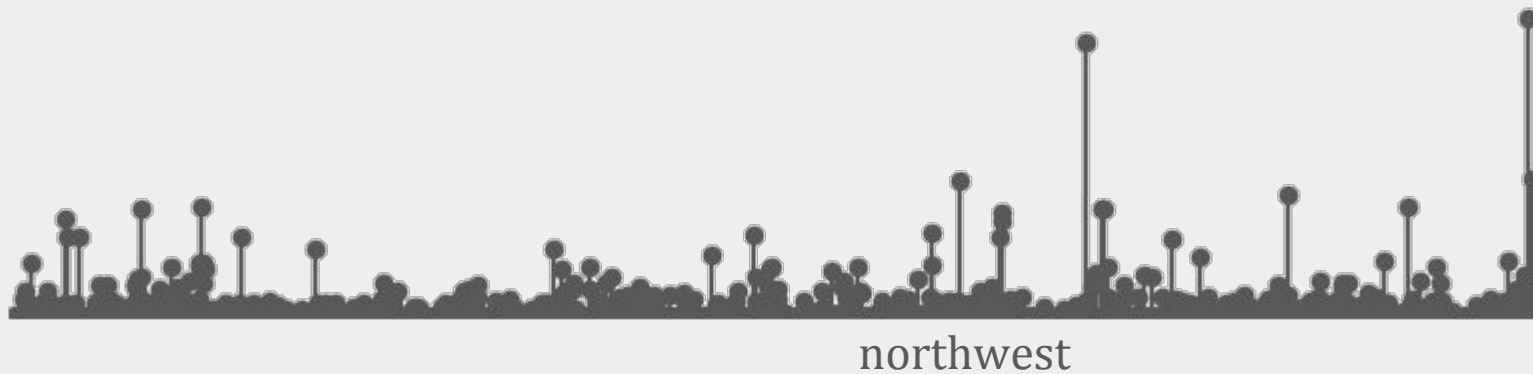
LDA



# NMF



# LDA



Let's find a host.