# Chef Machina

By Jordan Fairbanks

# The Problem

- Constantly writing new menus is extremely difficult
- Taste is extremely personal, no single menu will satisfy everyone
- Coming up with new ingredient pairings can be precarious

# The Solution! (I hope)

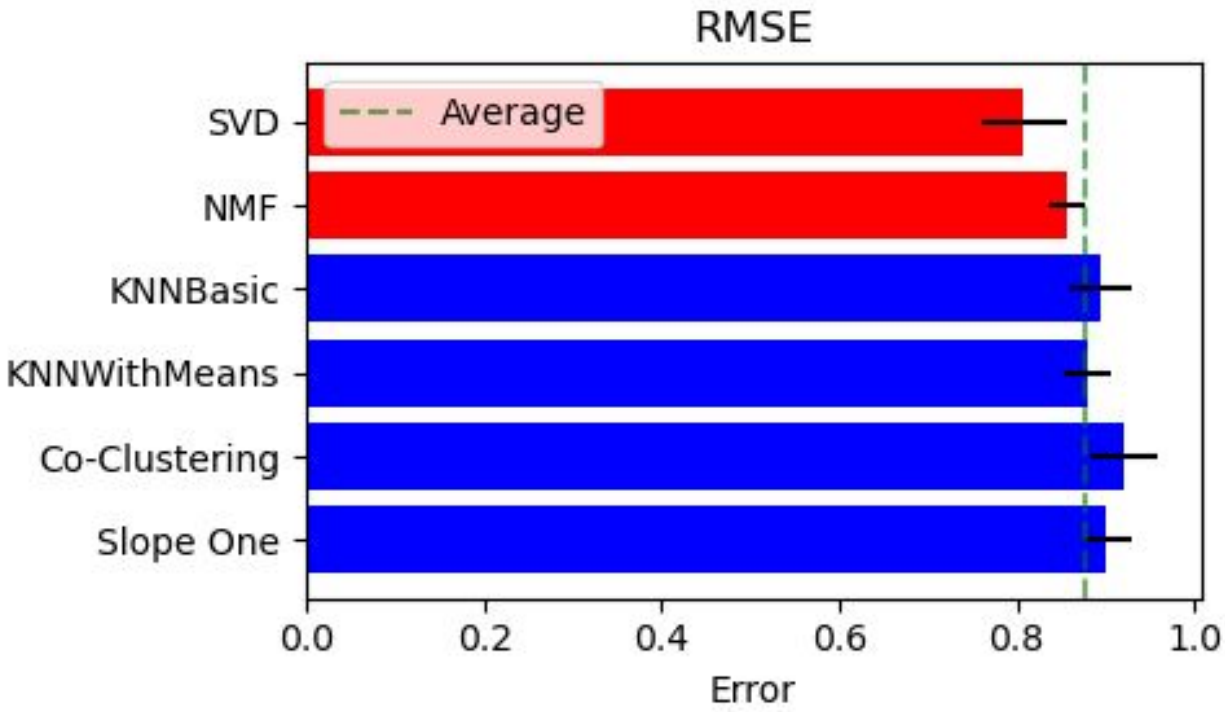
- Personalized recommendation algorithms have been implemented in many sectors already (Netflix, Amazon, Spotify)
- Ingredients from recipe recommendations could be dynamically analyzed and displayed

# How to Recommend

- Matrix Factorization (NMF, SVD)
  - Calculates the underlying relationships people have with food (i.e. vegetarians, meat lovers, cilantro-haters) as well as how each recipe fits into that relationship when making a prediction.
- K-Nearest Neighbors
  - Calculates which other user rated recipes similarly and makes a prediction based on the ratings from those users.
- Co-Clustering (natural groups)
  - Users and items are assigned some clusters, some are assigned to co-clusters and the average ratings for each cluster/co-cluster are factored into the prediction.
- Slope One
  - Only looks at the average difference between two items' ratings.

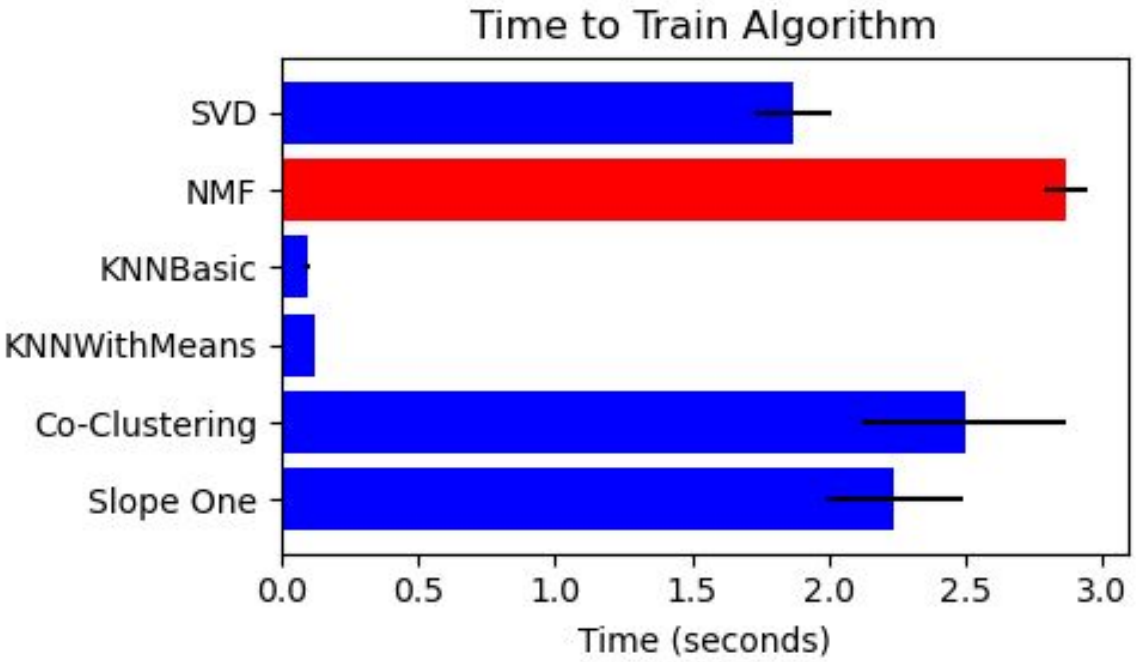
# How accurate are the predictions?

- Matrix factorization does a better job at predicting ratings
- Predictions were within .9 from actual ratings



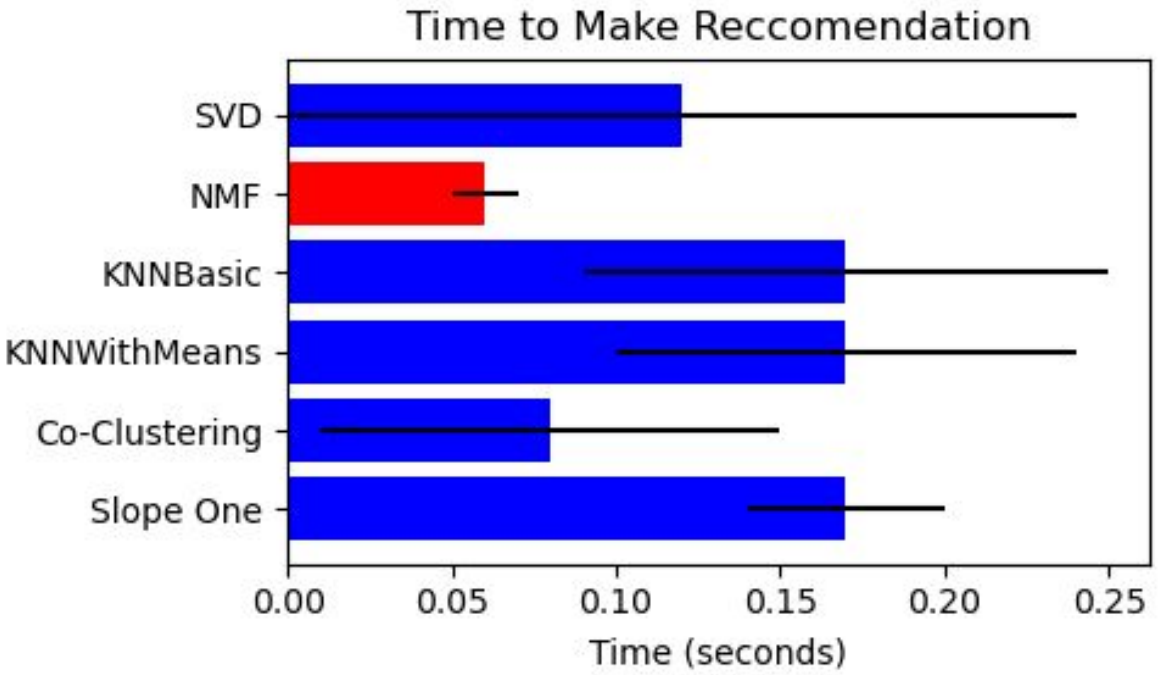
# Training Times

- Each Model has different advantages/disadvantages
- Matrix Factorization techniques take a longer time to train, **but...**

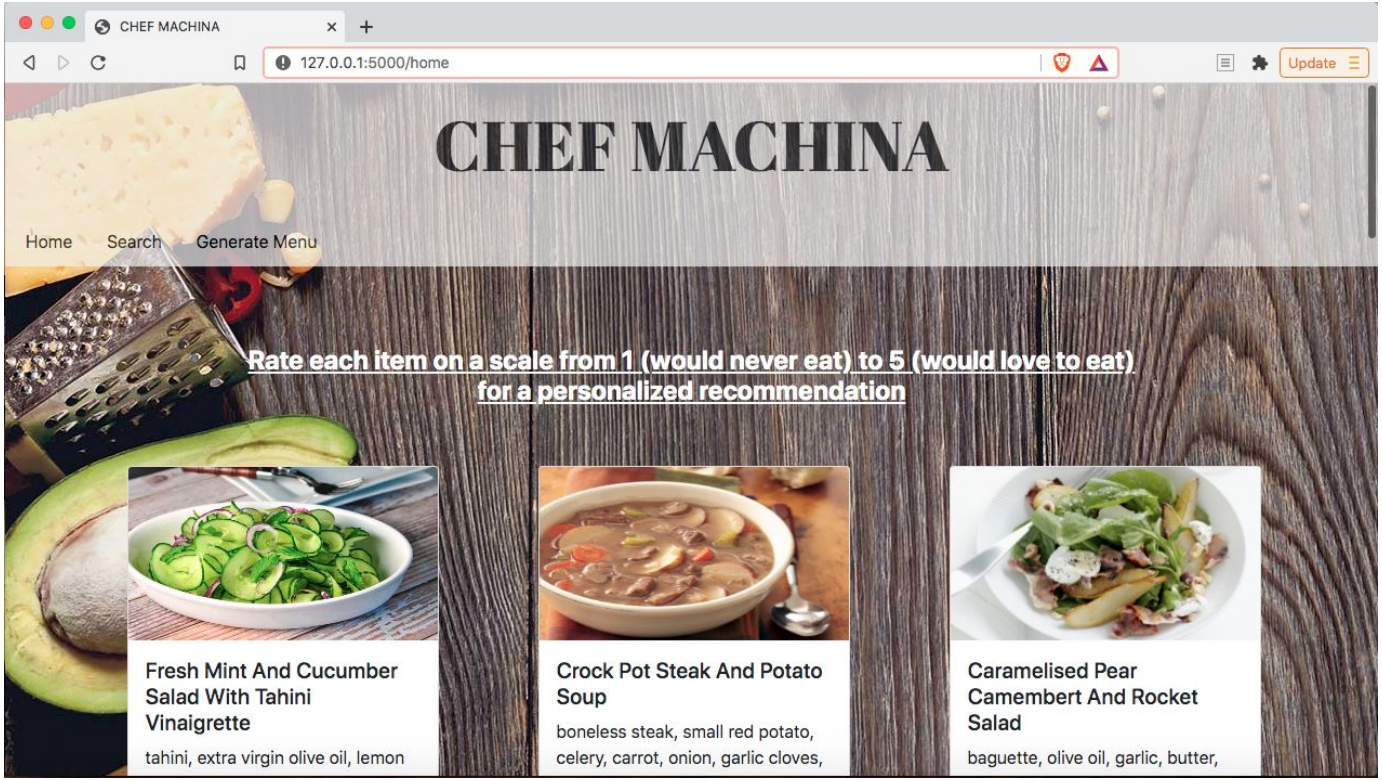


# Recommendation Times

- They can make recommendations much faster
- Faster recommendations opens up possibilities to build an API and sell it as a service



# Demo


CHEF MACHINA
127.0.0.1:5000/home
Update
CHEF MACHINA
Home
Search
Generate Menu
Rate each item on a scale from 1 (would never eat) to 5 (would love to eat)
for a personalized recommendation
Fresh Mint And Cucumber Salad With Tahini Vinaigrette
tahini, extra virgin olive oil, lemon
Crock Pot Steak And Potato Soup
boneless steak, small red potato, celery, carrot, onion, garlic cloves,
Caramelised Pear Camembert And Rocket Salad
baguette, olive oil, garlic, butter,

## Workflow/Tools:

# Conclusion/Next Steps

- Recommendation algorithms are powerful tools that can be used to assist chefs and other food professionals with everyday tasks.
- The tools I built can be expanded/applied problems faced by meal prep companies like Blue Apron, HomeChef, Fresh Direct

Next Steps:

- Incorporate a classifier model to classify recipes
- Keep track of cooking techniques and previous meals for each user
- Add ways to keep track of inventory when making suggestions


github.com/Jordan-Fairbanks


linkedin.com/in/jordanfairbanks