



Online courses recommendation system

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Introduction and objectives

- Time spent in searching engine can be reduced if relevant recommendations were provided.

Objectives

- Helping students to select academic content shaped to their interests.
- Providing suggestion of online courses .

Contents

- I** What is a recommendation system?
- II** Recommendation system: Examples
- III** Types of recommendation systems
- IV** Specification of the proposed solution
- V** Tests and results
- VI** Conclusion and perspectives



(I) What is a recommendation system?

Recommendation systems are **active information filtering systems** which **personalize the information** provided to users based on their **interests** and **predict the preferences** or ratings a user would give to a particular Content.

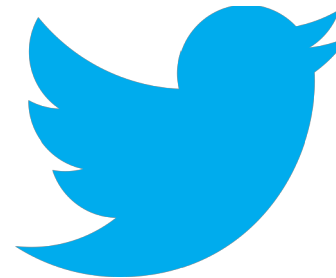
(II) Recommendation systems: Examples

amazon

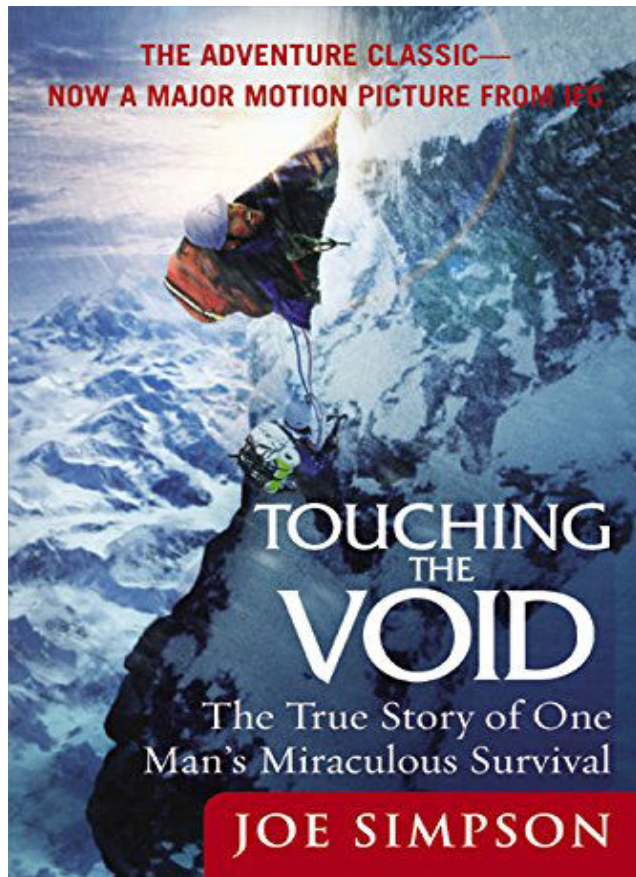


NETFLIX

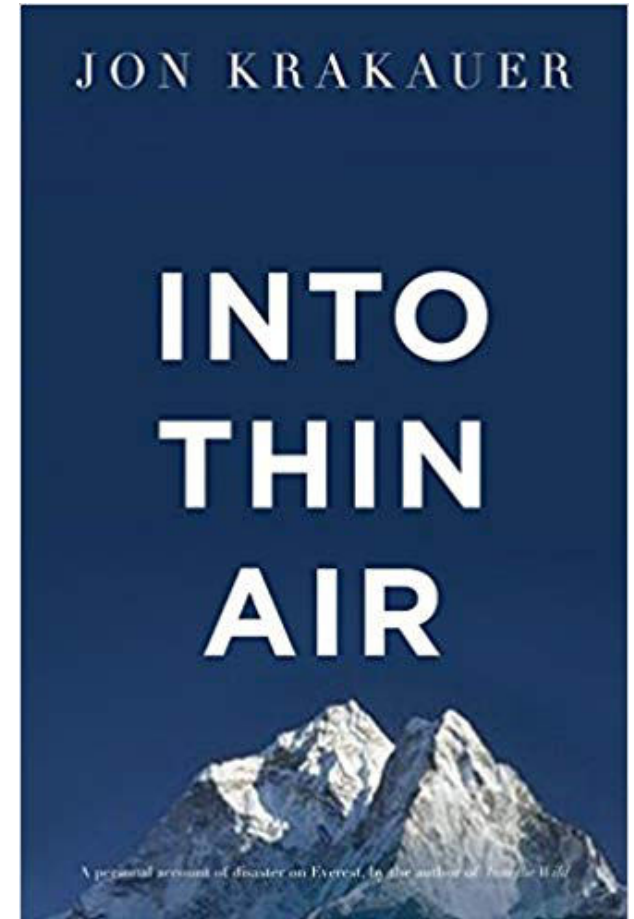
You Tube



(II) Recommendation systems: Examples



1988



1997



(III) Types of recommendation system

- 1- Popularity based recommendation
- 2- Collaborative bases recommendation
- 3- Content-bases recommendation

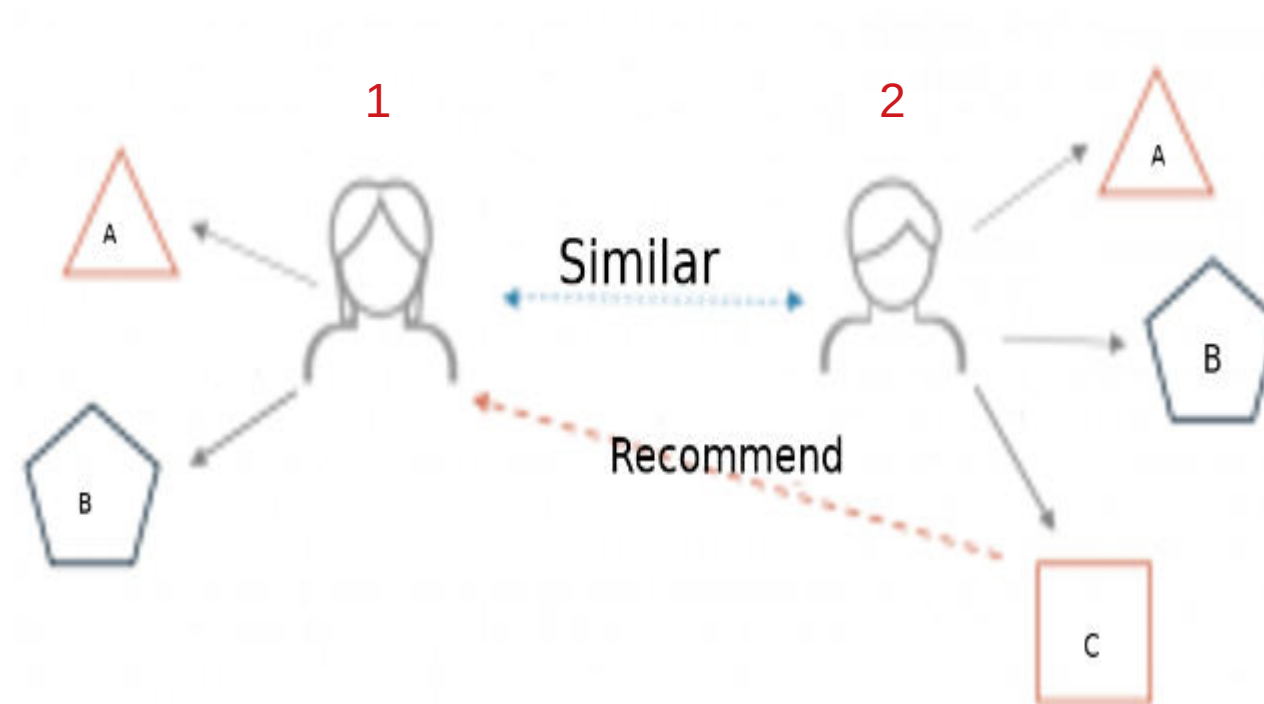


(III-1) Popularity based recommendation

- Most popular items will be recommended to the users.
- Popularity can be defined by:
 - Top rated products
 - Number of purchases/downloads..
 - ...

(III-2) Collaborative filtering based recommendation

- The recommendation is based on the preferences of other users





(III-3) Content-based recommendation

- Works with data that the user provides, either explicitly (**rating**) or implicitly (**clicking on a link**)
- Based on that data (& its metadata), a user **profile is generated**, which is then used to make a content suggestions.

(IV) Online course content-based recommendation system (1/4)

1- Analyze **USER'S INTEREST**:

Create a basic HTML platform with some general IT topics and ask the users to select topics that interest them.

2- Define the **USER PROFILE**:

Based on this selection, define a **vector of terms** defining the user's interest.*

* we suppose that the user does not prefer certain topics among others.

(IV) Online course content-based recommendation system (2/4)

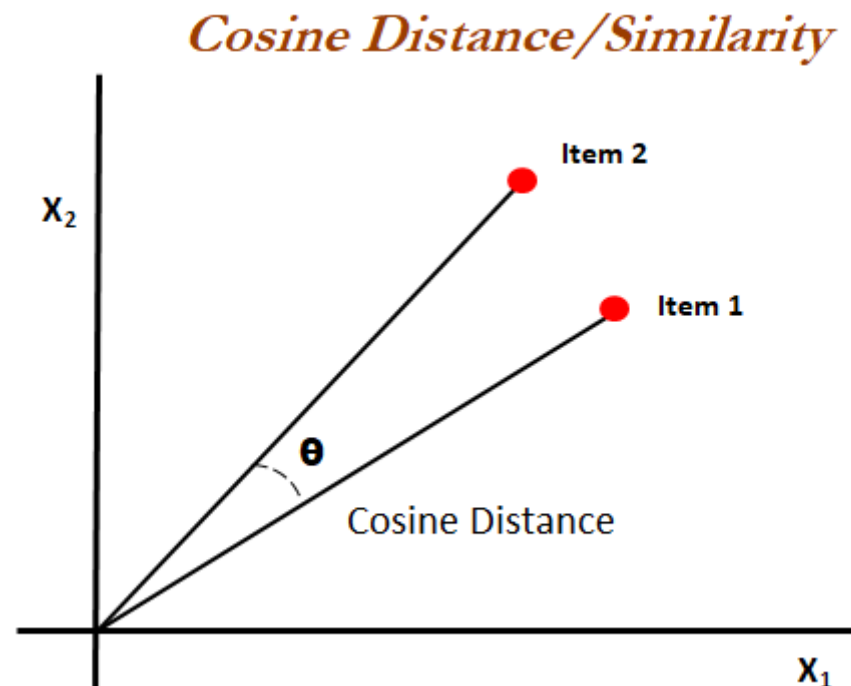
3- Define **COURSE PROFILE**

- **Courses selection:** from the website, crawl all the courses there and the link to each course. Crawled website: UDACITY
using: BeautifulSoup web crawler
- **Data Preprocessing:** remove irrelevant links, pick important words (filtering out stop words)
using: NLTK library
- **Information retrieval:**
Using TFIDF (Term Frequency-Inverse Term Frequency) heuristic, we **convert unstructured text into useful features** and generate the matrix that associates to each word in the data set a score.

(IV) Online course content-based recommendation system (3/4)

4- Determine **similarity**

- In this phase, we determine the **degree of similarity** between the **USER PROFILE** and the **COURSE PROFILE** using Cosine similarity to get a Similarity matrix





(IV) Online course content-based recommendation system (4/4)

5- Recommendation **result**:

- Sort the similarity matrix and return the top K similar courses (K=5)



(V) Tests and results

..Demo..

(VI) Conclusion and perspectives

- We have implemented a recommendation system using a small data set
- Although the similarity was not too high from 30%-71% for the tested scenarios, the recommended content was significantly related to the USER PROFILE

Improvements:

- To crawl much more websites and enlarge the used online courses data set.
- To improve the USER PROFILE creation by tracking the user's interest from different sides (not only the HTML platform)

References

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- Content-based Recommender Systems: State of the Art and Trends, Pasquale Lops, Marco de Gemmis, Giovanni Semeraro, Springer Link.
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Thanks for your attention!