Commendation System based on Price Evaluation

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Abstract : Recommender systems are meant for recommending products to customers according to their interests. Recommender system has several features namely, data collection and processing, recommender model, recommendation post processing and user interface etc. in order to recommend proper products to given user. The paper proposes a recommender system that will recommend the products that are relevant to user's interests in different domains. User interests are extracted with the help of his/her activities i.e based on the terms they are searching . Moreover ,the price comparison module in the system enables to compare the price of same product from two different sites. So, instead of navigating from one website to another ,same product with their respective prices is presented on a single web-based platform which will reduce navigation and hence the user is able to compare same product on single platform before purchasing it. The web-crawler will show the user most viewed sites or any articles related to the posted keyword/post. The user can also add the product to the cart and even place the order for that particular product for purchasing.

Keyword: web crawling algorithms , search algorithms.

Introduction:

There is a large amount of E-commerce websites with various products from many different categories. Although this provides wide range of products to surf through for user, user can find most of the products irrelevant to his/her interest. That's why recommender systems came into picture. Most of the recommender systems recommends the product to the user based on the domains the customer has surfed in the past. And based on it the system will recommend the product, text , articles, etc. related to the term they are looking for. When user want to purchase a product from any E-Commerce site ,then he/she looks for the price of the product from multiple sites . And each time he/she has to navigate through sites for comparing the product price and other details. Now-a-days ,most of the E-Commerce sites lack the feature of price comparison which makes them less productive . So the price comparison module enables the user to compare the product details on the same web-based platform . Moreover, the Chatbot will solve the user query related to the product.

Related Work:

Sometimes the users doesn't get the stuff recommendation from the system which they are looking for . At point, the text details related to the particular topic are least recommended to the users. Our recommender system leverages the existing publicly available data which is in the form of URLs or any keyword search ,which will help the user to get mostly viewed sites or trending topics related to topic of their interest. So that he/she can check the topic immediately by just visiting the given URL. In addition to this the system enables the user to add the keyword or URL of their interest. The price comparison module enables the user to compare product details available on two different sites, the product details on the same web-based

platform . The Chatbot module solves the user's query related to the product. The user is able to view the links which are mostly/top viewed by other users of similar interest.

Motivation:

The main Objective of the system is to compare prices from two different website on one single platform. It is same as Trivago which compares different hotel prices on a single web-based platform. As, Trivago recommends different hostels as per the user interest so as this recommendation system. The users of similar interest will be recommended same product .

Mathematical Model:

Mathematical model set theory S= {s, e, X, Y, Φ}
S= Start of the program
1. Register/Login into the system
2. Provide Website Data (i.e. Amazon and Flipkart)
3. Comparison
E= End of the program
Identify the product
X= input of the program= {P, R, Q}
P = Product Name
R = Product Price
W = Product Website
Y = Output of program = best Price Product
First, users provide Website product data for specific price
Let S be the set of Link
S={S1, S2, S3... Sn}
Let A be the set of Recommender Link
therefore,
A={A1, A2, A3..., Am}
E= {E1, E2, E3,..., Em}
Overall Recommender link is evaluated with the help of this User which basically represents quality of the product. Where m is number of overall Best Product.

System Architecture:

In our system we are using social networking as a source of data and according to user's interest system will recommend link by using crawler algorithm.
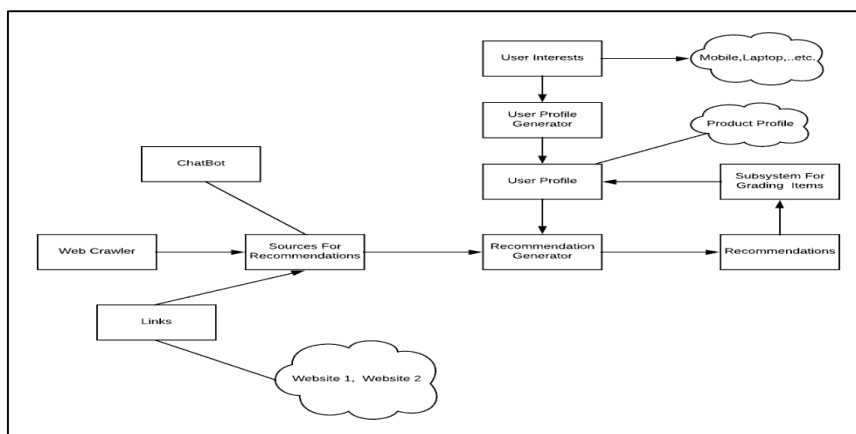
Fig. System Architecture

System overview:

Usually, the recommender systems like ecommerce sites predicts the rating or preference a user would give to an item. The proposed system is mainly focusing on price comparison and recommendation based on web crawler for the product or keyword entered by user. The working starts from the user registration which is followed by user's account credentials verification. As soon as the user registers, he will get two options, one is to search the product using keyword and other is to search the product using link. Application then recommends best products to the user with the help of web crawler algorithm which displays top rated and mostly fetched links to the user . User can also compare the price of the same product from two different shopping sites that he wants to buy using this application on a single screen. The main aim of using price comparison module is to reduce the time of user required to traverse through different sites to search the same product with the best features and in affordable price. Motive of web crawler is to recommend the top rated links to user which will provide more detailed information such as reviews, ratings about the product he/she wanted to buy, so that user is able to make a quick and better decision while purchasing a product with minimum time and efforts.

Algorithms used:

1. Web Crawler:

The size of the content on Internet is growing rapidly today and the user wants fast and accurate results for the search. This is now possible with the search engines provided to get accurate results for search. The web crawler technique in the proposed system is to recommend products related to their choice. The web crawler technique in our project suggest URLs related to customer search and recommends products to them. A crawler is a program that visits Web sites and reads their pages and other information in order to create entries for a search engine index. The search engines which we are using today all have a program named "spider" or "bot" which selects entire site or particular WebPages by visiting them and indexing them. The

name of the algorithm is Web Crawler because it crawls through the links and its sub links until all the WebPages are read.

2. POS Tagging and Chunking:

POS tagging is a supervised learning solution that reads text in some language and assigns parts of speech to each word such as noun, verb, adjective ,etc. The process of extracting phrases from unstructured text is termed as Chunking. In POS tagging, the chunking lies on the topmost layer as it uses pos-tags as input and provides chunks as output. There is a standard set of POS-tags similar there is standard set of Chunk-tags namely Noun Phrase(NP), Verb Phrase(VP),etc. Extracting useful information from the text such as location, name of a person is the important task of chunking process. As a supervised learning solution POS tagging uses features of considering previous word, next word , is first letter capitalized etc. NTLK works after tokenization process to get the POS-tags.

Example

In proposed system, if user enter "I would like to buy the blue jeans" , then POS tagging and chunking algorithm will get applied in this sentence and categorization will be performed on it. There are eight main parts of speech - nouns, pronouns, adjectives, verbs, adverbs, prepositions, conjunctions and interjections. So our example will get labeled according to their appropriate part of speech such as :PRO(Pronoun): I, V(Verb): like V(Verb): buy, optional determiner (DT):the, ADJ(Adjective):blue ,N(Noun): jeans

We have used Noun Phrase Chunking and we search for chunks corresponding to an individual noun phrase. A chunk grammar needs to be defines using POS-tags for creating NP chunk. This can be defines using a single expression rule. The rule states that whenever the chunk finds an optional determiner (DT) followed by any number of adjectives (JJ) and then a noun (NN) then the Noun Phrase(NP) chunk should be formed.

grammar = ('" NP: {<DT>?<JJ>*<NN>} # NP '")

Output:

[('I', 'PRO'), ('like', 'V'), ('buy', 'V'), ('the', 'DT'), ('blue', 'JJ'), ('jeans', 'NN'),]

Hence as the result of POS tagging and chunking ,recommendation will be performed on noun jeans followed by blue which is an adjective.

Conclusion:

Recommender systems are a powerful technology for the entertainment industry and social networks. To determine the user's area of interest we are using Natural Language Processing where we are successfully able to extract user's area of interest using POS tagging and chunking. Benefit of this system is there is no need to search the same product from different website. On this single platform, user can get the details of the same product available on different sites. Web crawling algorithm is used to display the top rated links to the user so that it will be helpful to him to take a appropriate decision while purchasing a product.

Chatbot using in-built AIML library is implemented which will help the user in case of any queries or doubts.

Future Work:

In future we can take the real data set of E-Commerce application and we can host this application on any E-Commerce platform. In future we will add more reviews for product which will help user to take a better decision while buying any product. Also the small-scale shop keepers and retailers can add their products in this site which will help them to grow their business dynamically. 3-D effect to the product is also added so that user can check the product from different angles, from top view, side view and can feel the look and structure of product.

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References:

[1] T. Pinckney, "eBay NYC - Graph-based Recommendation Engine on Cassandra," 30 July 2013. [Online]. Available:
https://www.hakkalabs.co/articles/tom-pickney-discusses-ebaysrecommendation-engine.

[2] G. Linden, B. Smith i J. York, »Amazon.com Recommendations Item-to-Item Collaborative Filtering,« 2003.

[3] C. A. Gomez i N. Hunt, »The Netflix Recommender System: Algorithms, Business Value, and Innovation,« ACM Trans. Manage. Inf. Syst., 2016.

[4] C. Mims, "MIT Technology Review - How iTunes Genius Really Works," 2010.[Online]. Available:
https://www.technologyreview.com/s/419198/how-itunes-geniusreally-works/.

[5] L. Xiang, "Hulu Tech blog - Hulu's Recommendation System," 19 September 2011. [Online]. Available:
http://tech.hulu.com/blog/2011/09/19/recommendationsystem.html.

[6] L. Wu, "Browsemap: Collaborative Filtering At LinkedIn," 23 October 2014. [Online]. Available:
https://engineering.linkedin.com/recommendersystems/browsemap-collaborative-filtering-linkedin