

Search Results Evaluation

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Overview

- Search Results Evaluation
 - Given the input and resulting product descriptions from e-commerce sites, build a model to evaluate the relevance of search results
 - Relevance is measured by 1-4
 - 1: Lowest relevance
 - 4: Highest relevance
- Workflow
 - Preprocessing
 - EDA
 - Feature Extraction: Count Vectorizer, TF-IDF Vectorizer
 - Model Selection: Random Forest, Support Vector Machine

Data Preprocessing

	id	query	product_title	product_description	median_relevance	relevance_variance
0	1	bridal shower decorations	Accent Pillow with Heart Design - Red/Black	Red satin accent pillow embroidered with a hea...	1	0.000
1	2	led christmas lights	Set of 10 Battery Operated Multi LED Train Chr...	Set of 10 Battery Operated Train Christmas Lig...	4	0.000
2	4	projector	ViewSonic Pro8200 DLP Multimedia Projector	NaN	4	0.471
3	5	wine rack	Concept Housewares WR-44526 Solid-Wood Ceiling...	Like a silent and sturdy tree, the Southern En...	4	0.000
4	7	light bulb	Wintergreen Lighting Christmas LED Light Bulb ...	WTGR1011\nFeatures\nNickel base, 60,000 averag...	2	0.471

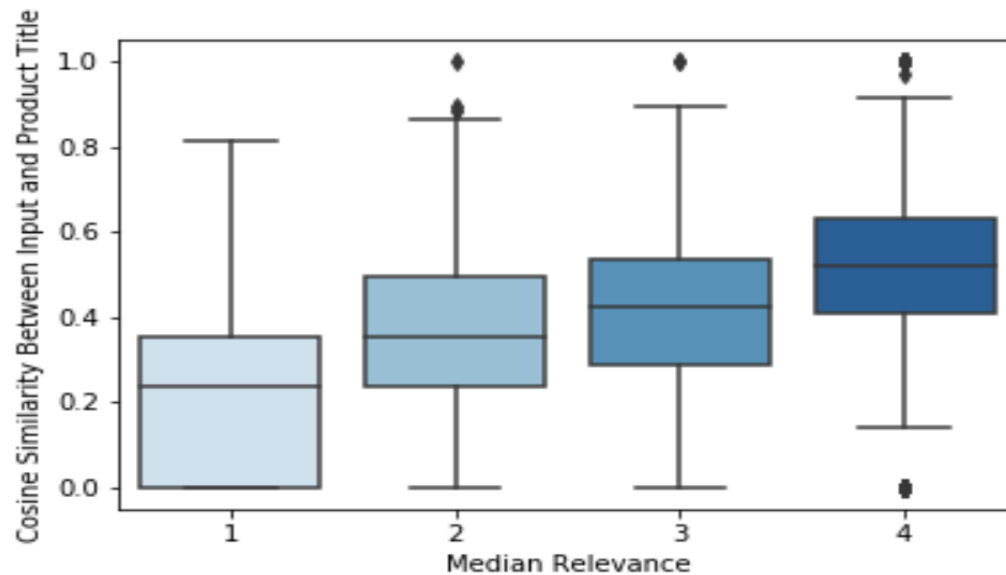
		query	product_title	product_description	median_relevance
0		bridal shower decoration	accent pillow heart design red black	red satin accent pillow embroider heart black ...	1
1		lead christmas light	set battery operate multi lead train christmas...	set battery operate train christmas light item...	4
2		projector	viewsonic pro dlp multimedia projector		4
3		wine rack	concept housewares wr solid wood ceiling wall ...	like silent sturdy tree southern enterprise bi...	4
4		light bulb	wintergreen light christmas lead light bulb pack	wtgr feature nickel base average hour acrylic ...	2

Drop HTML format
Drop non-letters
Remove stop words
Lemmatize

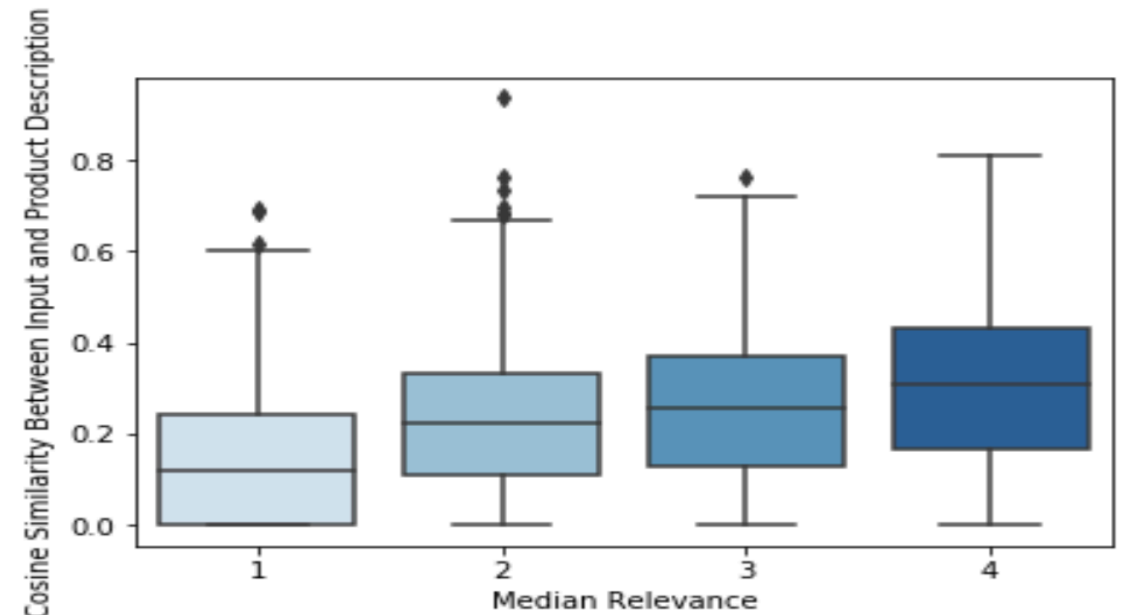
Early Exploratory Analysis

- Cosine similarity between columns

Input vs. Product Title



Input vs. Product Description



Modeling

- Ideas

- For each observation, combine "input", and "product_title" to create a long text, then vectorize it. By doing so we can capture the similarities between these two columns

- Example

- Input: "projector"; Product_title: "viewsonic pro dlp multimedia projector"
 - Vectorized text will be longer in the dimension of "projector"
- Input: "projector"; Product_title: "pillow with heart design"
 - Vectorized text will not be particularly longer in any dimension

Modeling

- Result
 - Metric: Quadratic Weighted Kappa
 - Measures the agreement between two ratings
 - Typically varies from 0 to 1
 - 0: Random agreement between raters
 - 1: Complete agreement between raters

	Count Vectorizer	TF-IDF Vectorizer
Random Forest	0.43416	0.45534
SVM	0.60345 😊	0.59078