

5. Clustering

Flat Clustering(K-Means):

To do flat clustering I chose K-means Clustering algorithm, K-means begins by randomly selecting K points from the dataset as initial centroids, representing the centers of the clusters. It then iterates through two main steps until convergence. In the first step, each data point is assigned to the nearest centroid based on a distance metric like Euclidean distance. This assignment forms initial clusters. In the second step, the centroids are updated by recalculating their positions as the mean of all data points assigned to each centroid.

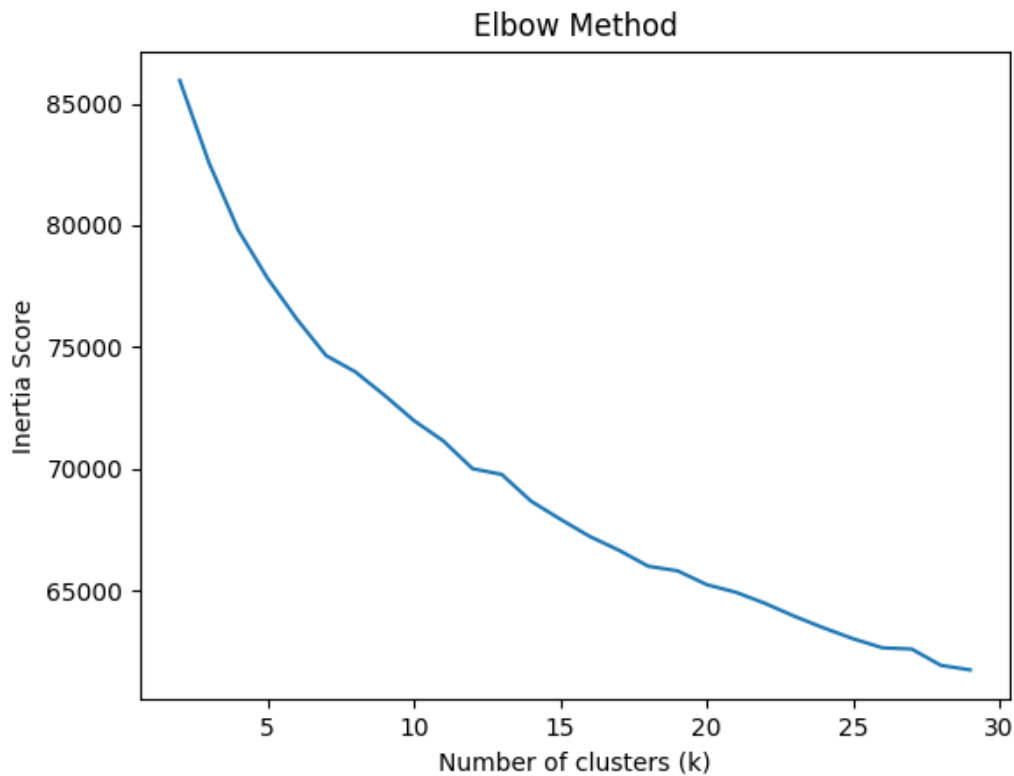
The algorithm continues these steps iteratively, reassigning data points and updating centroids, until the centroids stabilize (i.e., they no longer change significantly) or a maximum number of iterations is reached. The final clusters represent groups of data points that are close to each other in feature space, with the centroids serving as representative points for their respective clusters.

Preprocessing and Finding Optimal Clusters:

Initially Rakshitha crawled approximately 100k pages, and these pages were indexed by Zhang Yue. Using a Python script, I retrieved indexed data from Solr. Below are the steps that led to determining the optimal clusters:

1. Retrieved indexed data from Solr, including content, title, and URL, parsing them into lists.
2. Converted the content list into TF-IDF vectors using Python's Vectorizer.
3. Utilized a K-Means model to cluster the TF-IDF vectors, evaluating cluster quality via an elbow method.
4. Iterated through a range of clusters from 2 to 30 and plotted a graph of the number of clusters (K) against the inertia value.
5. Identified the elbow point on the graph, representing a significant drop in inertia, indicating the optimal number of clusters.

Elbow Graph Analysis: The plotted graph revealed that the optimal number of clusters for the given data was determined to be 7, as indicated by the elbow point where the inertia value sharply decreased."



Computing Clusters for 100K pages (Pre-Computed Clusters):

1. Choosing $K=7$ based on the above graph, I trained SK-learn K-means model with vectorized content (100k pages).
2. Then, the model predicted the clusters for the trained data, and it stored in a text file as precomputed clusters for visualization.
3. Later, the precomputed clusters are stored in a pickle file so that it can be used for predicting for new pages in the future.

Sample Set of Precomputed Clusters for 100k Pages:

<http://208.106.210.191/molissafenley/>,2
<http://achemicalhunger.com/>,2
<http://adagestudio.com/>,5
<http://adagestudio.com/adult-dance/>,5
<http://adagestudio.com/adult-fitness/>,5
<http://adagestudio.com/attire/>,2
<http://adagestudio.com/benefits-of-performing/>,5
<http://adagestudio.com/children-5/>,5
<http://adagestudio.com/contact-us/>,5
<http://adagestudio.com/day-program/>,5
<http://adagestudio.com/music/>,2
<http://adagestudio.com/policies-attendance/>,2
<http://adagestudio.com/registration/>,5
<http://adagestudio.com/studio-schedule/>,5
<http://adagestudio.com/studio/>,5
<http://adagestudio.com/summer-camps/>,5
<http://adagestudio.com/under-5/>,5
<http://adagestudio.com/videos/>,5
<http://adigitalkingdom.com/tag/web-design/page/2/>,2
<http://adigitalkingdom.com/tag/web-development/>,2
<http://batch.ba/datenschutzerklarung/>,2
<http://bblibraryland.blogspot.com/>,2
<http://beauty.indobase.com/index.html>,2
<http://beherenowmusic.com/>,2
<http://beherenowmusic.com/2016/08/10/afroman-2016/>,2
<http://beherenowmusic.com/comments/feed/>,2
<http://beherenowmusic.com/faq/>,2
<http://beherenowmusic.com/feed/>,2
<http://beherenowmusic.com/home/>,2
<http://beherenowmusic.com/past-events/>,2
<http://belly-dance.org/ghawazee.html>,5
<http://blo.gs/>,2
<http://blo.gs/cloud.php>,2
<http://blo.gs/news.php>,2
<http://blo.gs/ping.php>,2
<http://bossfm.net/>,2
<http://bossfm.net/About>,2
<http://bossfm.net/Advertising>,2
<http://bossfm.net/Contact>,2
<http://bossfm.net/Links>,2
<http://bossfm.net/On-Air-Talent>,2
<http://bossfm.net/On-Air-Talent.aspx>,2
<http://bossfm.net/Special-Pages/Terms.aspx>,2
<http://broadwaydancecenter.com/>,2
<http://broadwaydancecenter.com/events>,5
<http://broadwaydancecenter.com/faculty>,2
<http://broadwaydancecenter.com/summer-at-bdc>,5
<http://broadwaydancecenter.com/training/independent-training-program>,2
<http://broadwaydancecenter.com/training/professional-semester>,2
<http://brucekleppermusic.com/>,5
<http://brucekleppermusic.com/2019/05/16/1/>,2
<http://brucekleppermusic.com/2019/06/07/macht/>,2
<http://brucekleppermusic.com/about/>,2

<http://brucekleppermusic.com/comments/feed/>,2
<http://brucekleppermusic.com/download-music/>,2
<http://brucekleppermusic.com/feed/>,2
<http://brucekleppermusic.com/sign-out/>,2
<http://budapesttancfesztival.hu/>,2
<http://calmarchivecat.surrey.ac.uk/>,2
<http://cantiabavariandancers.blogspot.com/>,2
<http://changsfolkdancers.blogspot.com/>,2
<http://changsfolkdancers.blogspot.com/1970/>,2
<http://changsfolkdancers.blogspot.com/1970/02/>,2
<http://changsfolkdancers.blogspot.com/2008/>,2
<http://changsfolkdancers.blogspot.com/2008/01/>,2
<http://changsfolkdancers.blogspot.com/2008/01/directions.html>,2
<http://changsfolkdancers.blogspot.com/2008/01/family-folk-dance.html>,2
<http://changsfolkdancers.blogspot.com/2008/01/history-of-folk-dance-movement-in.html>,2
<http://changsfolkdancers.blogspot.com/2008/01/where.html>,2
<http://changsfolkdancers.blogspot.com/2008/02/>,2
<http://changsfolkdancers.blogspot.com/2008/02/carnaval-do-brazil-february-15.html>,2
<http://changsfolkdancers.blogspot.com/2008/02/family-folk-dance-night-with-greacian.html>,2
<http://changsfolkdancers.blogspot.com/2008/02/pictures-from-carnaval.html>,2
<http://changsfolkdancers.blogspot.com/2008/03/>,2
<http://changsfolkdancers.blogspot.com/2008/03/changs-turns-70.html>,2
<http://changsfolkdancers.blogspot.com/2008/03/march-party-friday-321.html>,2
<http://changsfolkdancers.blogspot.com/2008/03/pictures-from-march-28.html>,2
<http://changsfolkdancers.blogspot.com/2008/03/pictures-from-much-about-march-party.html>,2
<http://changsfolkdancers.blogspot.com/2008/04/>,2
<http://changsfolkdancers.blogspot.com/2008/04/dancing-on-april-25.html>,2
<http://changsfolkdancers.blogspot.com/2008/04/flowers-of-april-party-night-april-18.html>,2
<http://changsfolkdancers.blogspot.com/2008/05/>,2
<http://changsfolkdancers.blogspot.com/2008/05/maypole-2008.html>,2
<http://changsfolkdancers.blogspot.com/2008/05/swing-party-on-may-16th-with-carol-hom.html>,2
<http://changsfolkdancers.blogspot.com/2008/06/>,2
<http://changsfolkdancers.blogspot.com/2008/06/what-party.html>,2
<http://changsfolkdancers.blogspot.com/2008/10/>,2
<http://changsfolkdancers.blogspot.com/2008/11/>,2
<http://changsfolkdancers.blogspot.com/2008/11/great-italian-party.html>,2
<http://changsfolkdancers.blogspot.com/2008/11/more-pix-from-italian-party-night.html>,2
<http://changsfolkdancers.blogspot.com/2008/11/our-musicians-on-friday.html>,2
<http://changsfolkdancers.blogspot.com/2008/12/>,2
<http://changsfolkdancers.blogspot.com/2008/12/dickensvictorian-holiday-party-plus.html>,2
<http://changsfolkdancers.blogspot.com/2008/12/we-really-went-to-dickens-on-friday.html>,2
<http://changsfolkdancers.blogspot.com/2009/>,2
<http://changsfolkdancers.blogspot.com/2009/01/>,2
<http://changsfolkdancers.blogspot.com/2009/01/family-folk-dance-night.html>,2
<http://changsfolkdancers.blogspot.com/2009/01/israeli-party-night-dedicated-to-peace.html>,2
<http://changsfolkdancers.blogspot.com/2009/03/>,2
<http://changsfolkdancers.blogspot.com/2009/03/carnaval-2009.html>,2
<http://changsfolkdancers.blogspot.com/2009/03/coming-up-in-april-and-may-bay-area.html>,2
<http://changsfolkdancers.blogspot.com/2009/06/>,2
<http://changsfolkdancers.blogspot.com/2009/06/square-dance-party-this-friday-june-19.html>,2
<http://changsfolkdancers.blogspot.com/2009/06/square-dance-pix.html>,2
<http://changsfolkdancers.blogspot.com/2009/06/we-keep-dancing-over-summer-join-us.html>,2
<http://changsfolkdancers.blogspot.com/2009/07/>,5
<http://changsfolkdancers.blogspot.com/2009/07/bulgarian-party-this-friday.html>,2
<http://changsfolkdancers.blogspot.com/2009/07/dick-voyles-in-memori-am.html>,2
<http://changsfolkdancers.blogspot.com/2009/08/>,2

```
http://changsfolkdancers.blogspot.com/2009/08/caribbean-night-loud-joyful-and-fun.html,2
http://changsfolkdancers.blogspot.com/2009/11/,2
http://changsfolkdancers.blogspot.com/2009/11/join-us-for-harvest-dance-on-november.html,2
http://changsfolkdancers.blogspot.com/2009/11/shaking-it-at-changs.html,2
http://changsfolkdancers.blogspot.com/2009/12/,2
http://changsfolkdancers.blogspot.com/2009/12/russian-ice-snow-dance-party-on.html,2
http://changsfolkdancers.blogspot.com/2009/12/so-much-fun.html,2
http://changsfolkdancers.blogspot.com/2010/,2
http://changsfolkdancers.blogspot.com/2010/02/,2
http://changsfolkdancers.blogspot.com/2010/02/small-crowd-but-big-fun.html,2
http://changsfolkdancers.blogspot.com/2010/02/upcoming-special-dance-party-carnival.html,2
http://changsfolkdancers.blogspot.com/2010/04/,2
http://changsfolkdancers.blogspot.com/2010/04/april-festivities-right-around-corner.html,2
http://changsfolkdancers.blogspot.com/2010/04/march-madness-folk-dance-style.html,2
http://changsfolkdancers.blogspot.com/2010/05/,2
http://changsfolkdancers.blogspot.com/2010/05/celebrate-changs-72nd-birthday-with.html,2
http://changsfolkdancers.blogspot.com/2010/06/,2
http://changsfolkdancers.blogspot.com/2010/06/changs-72-and-still-dancing.html,2
http://changsfolkdancers.blogspot.com/2010/06/no-dancing-at-changs-on-friday-june-4th.html,2
http://changsfolkdancers.blogspot.com/2010/11/,2
http://changsfolkdancers.blogspot.com/2010/11/still-dancing-just-slow-to-post.html,2
http://changsfolkdancers.blogspot.com/2011/,2
http://changsfolkdancers.blogspot.com/2011/01/,2
http://changsfolkdancers.blogspot.com/2011/01/derek-maccormack-in-memori-am.html,2
http://changsfolkdancers.blogspot.com/2011/01/family-folk-dance-night-new-schedule.html,2
http://changsfolkdancers.blogspot.com/2011/03/,2
```

Prediction and Clustering Results to Integrate with UI (Collaboration with Sushila):

- 1. Relevance Model Selection:** When the user selects a relevance model on the UI, a backend process triggers API's (Node) to retrieve a JSON object from Solr. This object contains an attribute called "docs" containing the top 30 results, ranked in descending order based on the chosen relevance model.
- 2. Preprocessing Top Results:** The top 30 pages from Solr are preprocessed, including converting them into TF-IDF vectors as mentioned earlier.
- 3. Clustering with K-Means Model:** user selects Flat Clustering in UI, preloaded K-Means model from a pickle file is chosen, the TF-IDF vectors are clustered using the predict method. This step assigns each page to a specific cluster based on its content similarity.
- 4. Ranking and Integration:** Post-clustering, the pages are ranked to align with the clustering structure. For instance, all relevant pages belonging to the same cluster as the top-ranked result are grouped together and ranked based on their relevance scores (Page rank or HITS scores). This process continues iteratively until the desired threshold, typically 30 urls, is reached.
- 5. Response to UI:** The URLs, which are reranked based on the clusters formed with respective clustering IDs, are then sent back as a response to the UI. This integration ensures that users receive a coherent and meaningful display of search results, grouped by content similarity within clusters and ranked by relevance based on the chosen model.

Agglomerative clustering:

Preprocessing for all agglomerative clustering:

Initially Rakshitha, crawled approximately 100k pages, and these pages were indexed by Zhang Yue. Using a Python script, I retrieved indexed data from Solr. Below are the steps that led to determining the optimal clusters:

1. Retrieved indexed data from Solr for approximately 100k pages, including content, title, and URL, and parsed them into lists.
2. Converted the content list into TF-IDF vectors using Python's Vectorizer.
3. Due to hardware limitations, considered 70k samples for clustering. (even 50gb ram wasn't enough)
4. Randomly chose samples from the dataset to meet computational constraints.
5. As the feature space was still too large, performed dimensionality reduction on the 70k samples.
6. Used TruncatedSVD from scikit-learn with n_components=3 to reduce the samples to a 3-dimensional feature space.

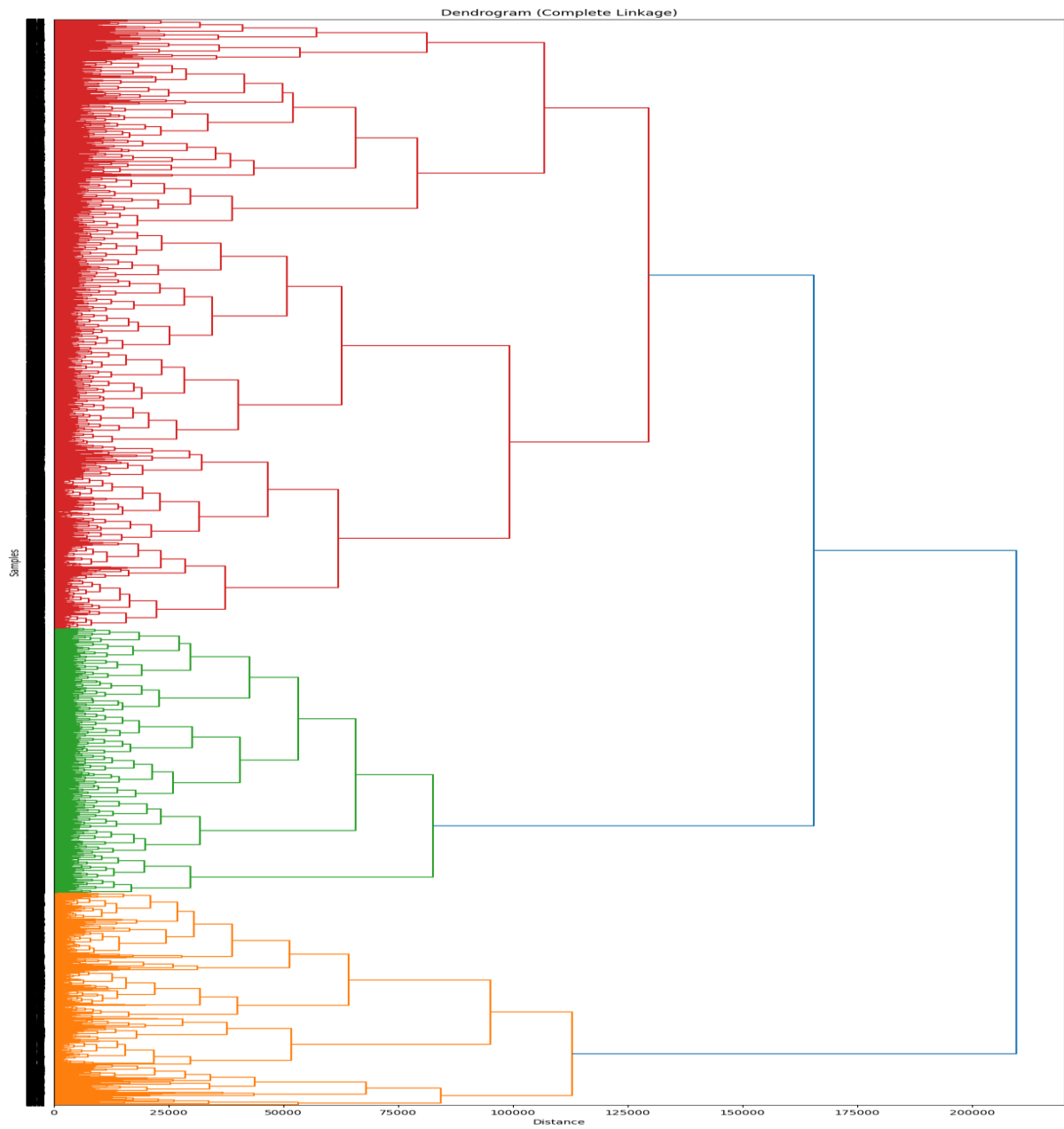
Finding Optimal Clusters for any linkage (Using Dendrogram and Elbow Graph):

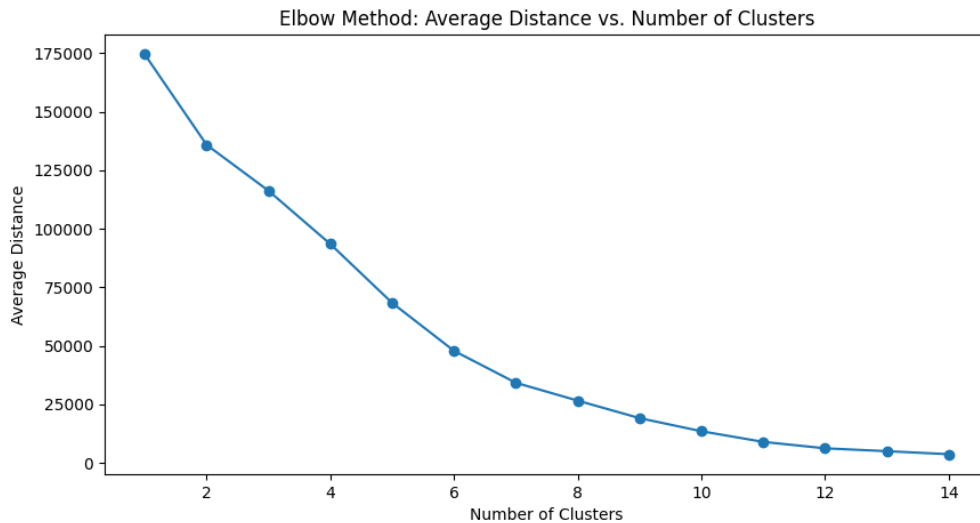
1. After reducing the vector space, feed the reduced vectors to the fastcluster library.
2. Use the linkage method in fastcluster with distance matrix to perform hierarchical clustering.
3. Choose the desired linkage method such as complete, single, average, or Ward's.
4. Plot a dendrogram based on the hierarchical clustering results.
5. Use the heights of the dendrogram to plot an elbow graph with k range from 2 to 14 clusters.
6. Determine the optimal height on the elbow graph to decide the number of clusters for the linkage method.

Dendrogram's and Elbow Graph's:

The dendrogram's plotted below are challenging to interpret due to the large number of samples, making it difficult to view the URLs properly. Therefore, I opted to plot the dendrogram against the corresponding index for each URL instead.

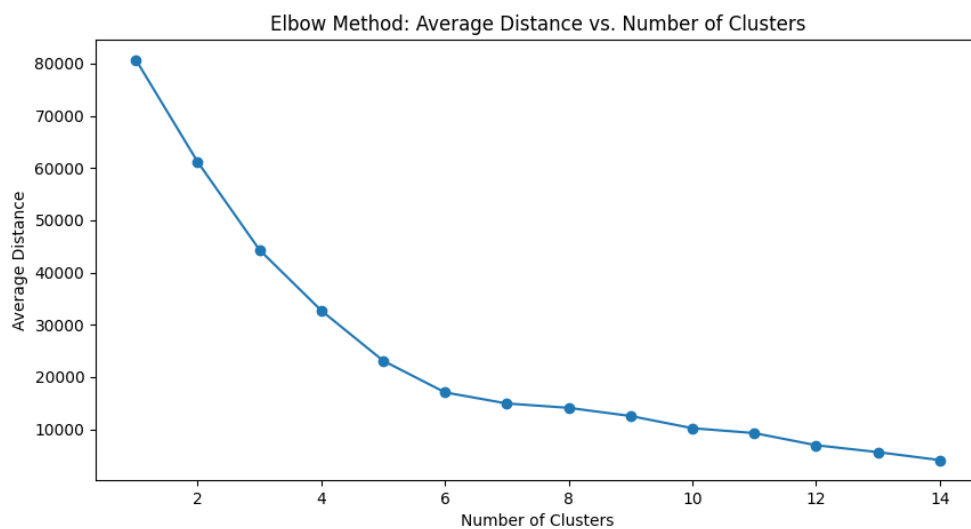
Complete Linkage: It is a hierarchical clustering technique that merges clusters based on the maximum distance between any two points in different clusters. In other words, it measures cluster similarity by the distance of the farthest points between clusters. This approach tends to create compact, spherical clusters with minimal internal variance but can be sensitive to outliers or noise in the data.



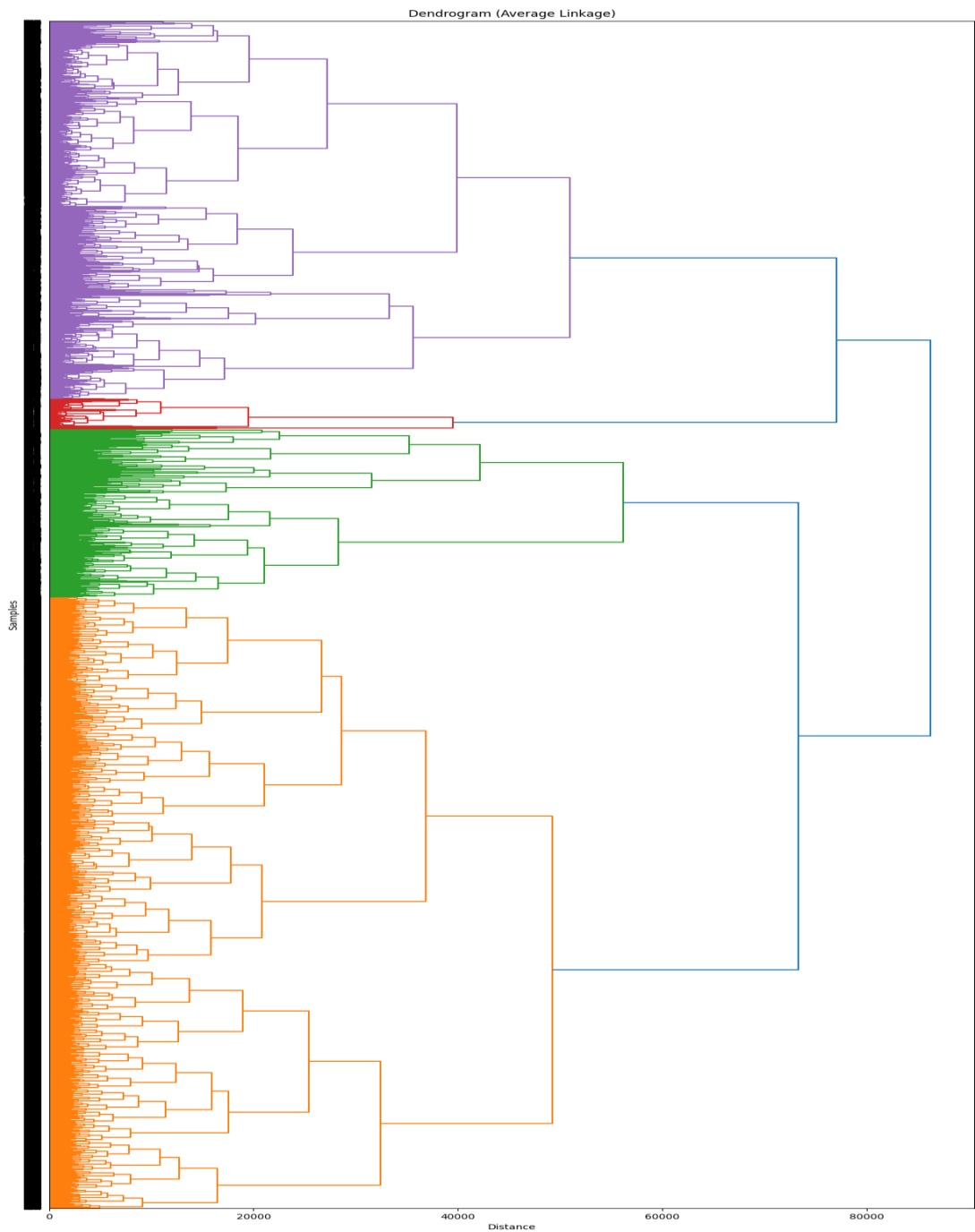


Observing the graph above, it's evident that $k=7$ is the most suitable choice for determining the optimal number of clusters, especially when considering complete linkage.

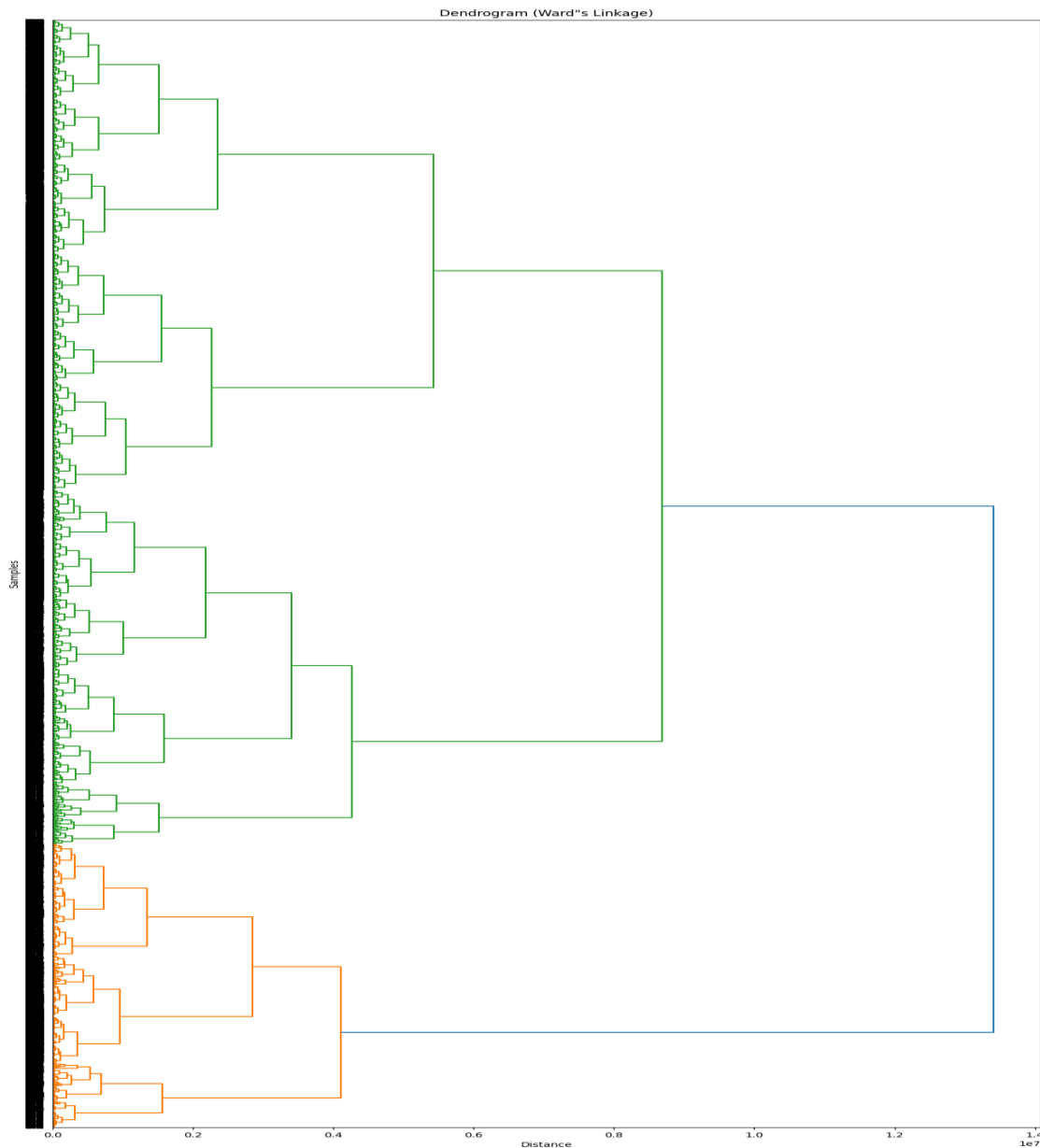
Average Linkage: It is a hierarchical clustering method that computes the average distance between all pairs of points in different clusters to determine cluster similarity. Unlike complete linkage, which considers the maximum distance, average linkage considers the average distance, making it more robust to outliers or noise in the data. This approach tends to produce clusters that are more balanced in size and shape, making it a popular choice for various clustering tasks.

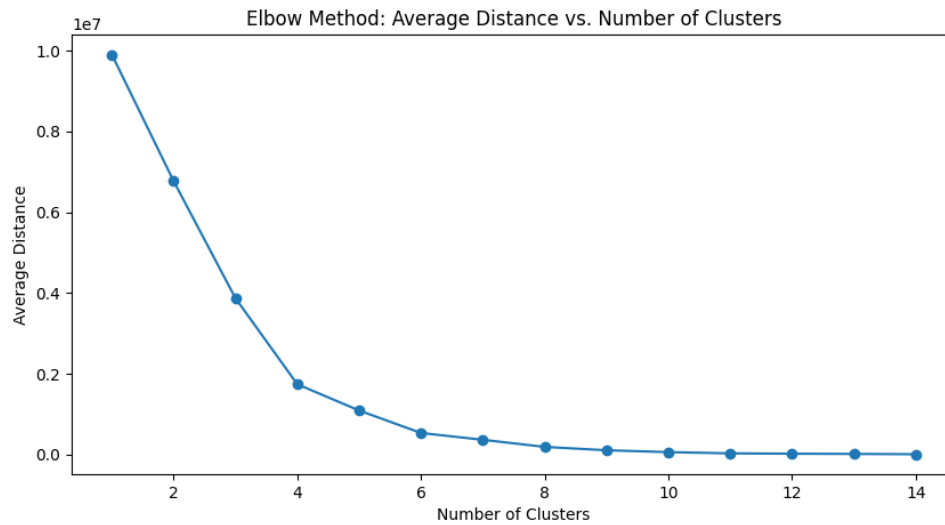


Observing the graph above, it's evident that $k=6$ is the most suitable choice for determining the optimal number of clusters, especially when considering average linkage.



Ward Linkage: It is a method that merges clusters based on minimizing the variance within clusters when they are combined. It calculates the increase in variance that occurs when two clusters are merged and aims to minimize this increase. Ward linkage is particularly effective for creating compact and evenly sized clusters, making it suitable for datasets with varying cluster densities. However, it can be sensitive to outliers and noise, and it may not perform as well in certain scenarios compared to other linkage methods like average or complete linkage.





Observing the graph above, it's evident that $k=5$ is the most suitable choice for determining the optimal number of clusters, especially when considering ward's linkage.

Computing Clusters for 70K pages (Pre-Computed Clusters) for any linkage:

1. Based on the previously calculated cluster values for different linkage methods (complete with $K=7$, Ward's with $K=6$, and average with $K=5$), I trained the scikit-learn Agglomerative Clustering model with appropriate linkage chosen, using vectorized content for 70K pages.
2. The model then predicted clusters for the trained data, which were stored in a text file as precomputed clusters for visualization purposes.
3. Subsequently, the precomputed clusters were saved in a pickle file to enable their use for predicting clusters for new pages in the future.
4. Repeat steps 1 to 3 for different linkage methods (complete with $K=7$, Ward's with $K=6$, and average with $K=5$ clusters) to compute clusters for 100K pages using precomputed clusters.

Sample Set of Precomputed Clusters for 70K Pages Using Complete Linkage:

<https://www.powells.com/post/lists/new-literature-in-translation-november-2023>,0
<https://www.givemn.org/help>,2
<https://www.cbsnews.com/news/bison-populations-fort-peck-montana-indian-reservation/>,2
<https://devowl.io/2022/wordpress-calendar-plugins/>,2
<https://www.encyclopedia.com/environment/science-magazines/bee-creek-cave-harvestman>,0
<https://www.britannica.com/question/How-did-Coco-Chanel-become-famous>,0
<https://nmaahc.si.edu/explore/initiatives/history-rebellion-and-reconciliation>,0
<https://www.nytimes.com/2023/11/14/health/long-term-care-resources-caregivers.html>,0
<https://www.britannica.com/topic/Federal-Bureau-of-Investigation>,0
<https://www.youtube.com/embed/CpXOBHDiFD8>,2
<https://code.org/about/2022>,2
<https://pantheon.world/profile/occupation/dancer/country/united-states>,2
<https://dancechanneltv.com/film/education>,4
<https://www.theguardian.com/sport/nba>,2
<http://www.lotusmusicanddance.org/caren-calder>,6
<https://www.youtube.com/channel/UCAuerig2N-RZWJT8x75V9yw>,2
<https://www.danceinforma.com/tag/dance-flooring/>,6
<http://www.hyderabad.org.uk/facts/index.html>,2
<https://www.soulbrazil.com.au/home/feed/>,2
<https://www.diggitmagazine.com/papers/deviantart-and-ai-showdown-between-manual-playbour-and-automated-playbour>,0
<https://www.cbsnews.com/boston/video/wayfair-is-laying-off-more-than-1600-workers/>,2
<https://dancingastronaut.com/2023/11/celebrating-10-years-of-iii-points-under-the-disco-ball-review/>,2
<https://archives.nysl.org/collection/digital>,2
<https://hiphopinternational.com/2016/08/page/2/>,4
https://pantheon.world/profile/person/Andrew_Carnegie,2
<https://seasia.co/2023/09/24/thailand-reverses-course-tightens-control-on-cannabis-use>,2
<https://www.dollsofindia.com/product/mohini-mural-poster-DR29.html>,3
<https://www.diggitmagazine.com/articles/sublime-cannibal-holocaust>,2
<https://www.dollsofindia.com/product/srinathji-krishna-and-sudama-poster-BD23.html>,3
<https://www.britannica.com/topic/The-Great-Gatsby>,0
<https://www.encyclopedia.com/people/science-and-technology/physics-biographies>,0
<https://www.danceadvantage.net/tag/rest-and-recovery/>,6
<https://www.cbsnews.com/team/tony-dokoupil/>,2
<https://www.pinterest.com/feiiatrapasueos/>,2
<https://www.britannica.com/money/home-equity>,0
<https://www.encyclopedia.com/arts/educational-magazines/elder-karl-1948>,0
<https://www.danceusa.org/jobsandauditions>,4
<https://www.dictionary.com/browse/deaf>,0
<https://www.encyclopedia.com/humanities/dictionaries-thesauruses-pictures-and-press-releases/foley>,0
<https://www.health.vic.gov.au/public-health>,2
<https://thedemostop.com/blogs/instruments/drums/types-of-snare-drums/>,2
<https://www.learntodance.com/sell-your-product-on-learntodance-com/>,6
<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/age-and-fertility>,2
<https://hotjazzjubilee.com/wp-content/uploads/2024/02/HJJ-Sponsorship-Opportunitites-2024.pdf>,2
<https://informatika20.sk/>,2
https://pantheon.world/profile/person/Paul_Tergat,2
https://pantheon.world/profile/person/Jan_Twardowski,2
<https://www.dollsofindia.com/product/murlidhar-krishna-stone-dust-statue-PT24.html>,3
<https://ballroomdanceacademy.com/news/this-inspiring-woman-competed-in-the-olympics-after-being-diagnosed-with-cancer/>,6
<https://code.org/educate/weblab>,2
<https://www.divyakasturi.com/press>,2

<https://www.loc.gov/item/05039056/>,4
<https://www.danceshoesstore.com/SERA7030%2032%20Coffee%20Brown%20Crocodile,2>
<https://github.com/premium-support,2>
<https://www.dancemagazine.com/category/news/breaking-stereotypes/page/3/,6>
<https://www.britannica.com/money/Federal-Trade-Commission,0>
<https://www.dollsofindia.com/product/jagannath-balaram-subhadra-with-chariot-wheel-SH55.html,3>
<https://www.pinterest.com/ideas/pop-culture/931853262094/,2>
<https://www.dollsofindia.com/product/2-beaded-small-garlands-for-deity-UK71.html,3>
<https://www.unpublishedzine.com/sex-intimacy/and-just-like-that-sex-and-the-city-taught-me-some-things-about-sex-and-relationships,2>
<https://www.disneyplus.com/es-cz/series/growing-up/4pPvFiXmJMse,2>
<https://www.dictionary.com/browse/ahoy,0>
<https://www.worldatlas.com/maps/sao-tome-and-principe,2>
https://www.thebetterindia.com/wp-content/plugins/thebetterindia-manager/build/img/icons/close_icon.svg,2
<https://www.bluepencilpublishers.com/product/incomparable-sachin-dev-burman/,2>
[https://www.chickasaw.net/Our-Nation/Locations/Arts-Humanities-\(Abney\),2](https://www.chickasaw.net/Our-Nation/Locations/Arts-Humanities-(Abney),2)
<https://www.danceadvantage.net/tag/dancing-with-cancer/,6>
<https://www.gotquestions.org/Polski/sluzbie.html,2>
<https://www.britannica.com/story/five-years-later-the-great-sendai-earthquake,0>
<https://www.lotusmusicanddance.org/elissaveta-iordanova,6>
<https://pantheon.world/profile/person/Duwa,2>
<https://www.dollsofindia.com/product/apsara-patta-painting-on-palm-leaf-bookmark-SJ88.html,3>
<https://docs.flutter.dev/get-started/install,2>
<https://www.worldatlas.com/articles/what-languages-are-spoken-in-kuwait.html,0>
<https://www.buddhistdoor.net/features/little-did-they-know/,0>
<https://www.feldenkraiswithjen.com/tienda,2>
<https://seasia.co/2022/07/03/top-3-best-selling-cars-2021-in-each-asean-country,0>
https://pantheon.world/profile/person/Ninette_de_Valois,2
<https://www.dollsofindia.com/posters/pictures-with-stands/large/,3>
<https://www.dollsofindia.com/product/wood-sculpture/pen-and-pencil-holder-HC76.html,3>
<https://www.accartbooks.com/us/book/thierry-mugler/,2>
<http://gmpg.org/xfn/creator-fr,2>
<https://www.balletdancersguide.com/career-development-plan-can-i-still-be-a-professional-ballet-dancer.html,2>
<https://www.worldatlas.com/maps/lebanon,2>
<https://lcn.loc.gov/15008911/marcxml,4>
<https://onlinebharatanatyam.com/tag/indian-classical-dance/feed/,2>
https://pantheon.world/profile/person/Karla_Souza,2
https://pantheon.world/profile/person/Edward_VII,2
<https://creativecommons.org/licenses/by-nc-nd/4.0/,2>
<https://listverse.com/fact-fiction/books/feed/,2>
<https://www.dancemagazine.com/tag/lou-conte/,6>
<https://www.nytimes.com/sitemap/1989/,2>
<https://github.com/orgs/LibraryOfCongress/people,2>
<https://bucketlistjourney.net/eating-a-century-egg-at-a-thai-market/,2>
https://public.websites.umich.edu/~ac213/student_projects06/dorir/plena.html,4
<https://music.apple.com/gm/browse,2>
<https://kalkbuckmedi21.s3.ap-south-1.amazonaws.com/pdf/regulations/Regulations-Draft.pdf,2>
<https://www.britannica.com/science/malachite-green,0>
<https://www.danceinforma.com/2020/09/30/boston-ballet-reimagines-2020-21-season/,6>
<https://www.diggitmagazine.com/articles/playing-cultural-identity-through-art,0>
<https://danceinforma.us/articles/tag/smuin-contemporary-ballet/,6>
<https://www.culturalindia.net/indian-art/paintings/index.html,2>
https://pantheon.world/profile/person/Phyllis_Coates,2
<https://www.worldchampionproductions.com/event/bronze-class-with-chris-foxtrot/2024-05-07/,6>
<https://www.razzmajazz.com/what-we-do/marching-band/,2>
<https://www.conted.ox.ac.uk/about/pgdip-in-paediatric-infectious-diseases,2>

https://pantheon.world/profile/person/Ella_Maillart,2
<https://nmaahc.si.edu/about/news/national-museum-african-american-history-and-culture-celebrates-black-history-month,0>
<https://www.contemporary-dance.org/choreographic-analysis-from-the-perspective-of-aesthetics.html,2>
<https://www.dollsofindia.com/product/cute-miniature-dolls/ram-bhakt-hanuman-clay-KN59.html,3>
<https://pantheon.world/profile/person/Patanjali,1>
<https://www.dollsofindia.com/read/mahatma-gandhi-pictures.htm,1>
https://pantheon.world/profile/person/Filippo_Taglioni,2
<https://www.fredastaire.com/about/,6>
<https://www.accartbooks.com/us/book/car-racing-1965/,0>
https://pantheon.world/profile/person/Alberto_Santos-Dumont,2
<https://www.dictionary.com/e/famous-people/yoko/,0>
<https://culturallyyours.com/2024/03/31/voileipakakku-scandinavian-sandwich-cake/feed/,2>

Sample Set of Precomputed Clusters for 70K Pages Using Average Linkage:

<https://www.powells.com/post/lists/new-literature-in-translation-november-2023,0>
<https://www.givemn.org/help,0>
<https://www.cbsnews.com/news/bison-populations-fort-peck-montana-indian-reservation/,0>
<https://devowl.io/2022/wordpress-calendar-plugins/,0>
<https://www.encyclopedia.com/environment/science-magazines/bee-creek-cave-harvestman,4>
<https://www.britannica.com/question/How-did-Coco-Chanel-become-famous,4>
<https://nmaahc.si.edu/explore/initiatives/history-rebellion-and-reconciliation,0>
<https://www.nytimes.com/2023/11/14/health/long-term-care-resources-caregivers.html,0>
<https://www.britannica.com/topic/Federal-Bureau-of-Investigation,4>
<https://www.youtube.com/embed/CpXOBHDiFD8,0>
<https://code.org/about/2022,0>
<https://pantheon.world/profile/occupation/dancer/country/united-states,0>
<https://dancechanneltv.com/film/education,0>
<https://www.theguardian.com/sport/nba,0>
<http://www.lotusmusicanddance.org/caren-calder,2>
<https://www.youtube.com/channel/UCAuerig2N-RZWT8x75V9yw,0>
<https://www.danceinforma.com/tag/dance-flooring/,2>
<http://www.hyderabad.org.uk/facts/index.html,0>
<https://www.soulbrazil.com.au/home/feed/,0>
<https://www.diggitmagazine.com/papers/deviantart-and-ai-showdown-between-manual-playbour-and-automated-playbour,0>
<https://www.cbsnews.com/boston/video/wayfair-is-laying-off-more-than-1600-workers/,0>
<https://dancingastronaut.com/2023/11/celebrating-10-years-of-iii-points-under-the-disco-ball-review/,0>
<https://archives.nypl.org/collection/digital,0>
<https://hiphopinternational.com/2016/08/page/2/,0>
https://pantheon.world/profile/person/Andrew_Carnegie,0
<https://seasia.co/2023/09/24/thailand-reverses-course-tightens-control-on-cannabis-use,0>
<https://www.dollsofindia.com/product/mohini-mural-poster-DR29.html,1>
<https://www.diggitmagazine.com/articles/sublime-cannibal-holocaust,0>
<https://www.dollsofindia.com/product/srinathji-krishna-and-sudama-poster-BD23.html,1>
<https://www.britannica.com/topic/The-Great-Gatsby,4>
<https://www.encyclopedia.com/people/science-and-technology/physics-biographies,4>
<https://www.danceadvantage.net/tag/rest-and-recovery/,2>
<https://www.cbsnews.com/team/tony-dokoupil/,0>
<https://www.pinterest.com/feiatrapasueos/,0>
<https://www.britannica.com/money/home-equity,0>
<https://www.encyclopedia.com/arts/educational-magazines/elder-karl-1948,4>
<https://www.danceusa.org/jobsandauditions,2>
<https://www.dictionary.com/browse/deaf,0>

<https://www.encyclopedia.com/humanities/dictionaries-thesauruses-pictures-and-press-releases/foley>,4
<https://www.health.vic.gov.au/public-health>,0
<https://thedemostop.com/blogs/instruments/drums/types-of-snare-drums/>,0
<https://www.learntodance.com/sell-your-product-on-learntodance-com/>,2
<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/age-and-fertility>,0
<https://hotjazzjubilee.com/wp-content/uploads/2024/02/HJJ-Sponsorship-Opportunitites-2024.pdf>,0
<https://informatika20.sk/>,0
https://pantheon.world/profile/person/Paul_Tergat,0
https://pantheon.world/profile/person/Jan_Twardowski,0
<https://www.dollsofindia.com/product/murlidhar-krishna-stone-dust-statue-PT24.html>,1
<https://ballroomdanceacademya.com/news/this-inspiring-woman-competed-in-the-olympics-after-being-diagnosed-with-cancer/>,2
<https://code.org/educate/weblab>,0
<https://www.divyakasturi.com/press>,0
<https://www.loc.gov/item/05039056/>,2
<https://www.danceshoesstore.com/SERA7030%20232%20Coffee%20Brown%20Crocodile>,0
<https://github.com/premium-support>,0
<https://www.dancemagazine.com/category/news/breaking-stereotypes/page/3/>,2
<https://www.britannica.com/money/Federal-Trade-Commission>,4
<https://www.dollsofindia.com/product/jagannath-balaram-subhadra-with-chariot-wheel-SH55.html>,1
<https://www.pinterest.com/ideas/pop-culture/931853262094/>,0
<https://www.dollsofindia.com/product/2-beaded-small-garlands-for-deity-UK71.html>,1
<https://www.unpublishedzine.com/sex-intimacy/and-just-like-that-sex-and-the-city-taught-me-some-things-about-sex-and-relationships>,0
<https://www.disneyplus.com/cs-cz/series/growing-up/4pPvFiXmJMse>,0
<https://www.dictionary.com/browse/ahoy>,0
<https://www.worldatlas.com/maps/sao-tome-and-principe>,0
https://www.thebetterindia.com/wp-content/plugins/thebetterindia-manager/build/img/icons/close_icon.svg,0
<https://www.bluepencilpublishers.com/product/incomparable-sachin-dev-burman/>,0
[https://www.chickasaw.net/Our-Nation/Locations/Arts-Humanities-\(Abney\)](https://www.chickasaw.net/Our-Nation/Locations/Arts-Humanities-(Abney)),0
<https://www.danceadvantage.net/tag/dancing-with-cancer/>,2
<https://www.gotquestions.org/Polski/sluzbie.html>,0
<https://www.britannica.com/story/five-years-later-the-great-sendai-earthquake>,4
<https://www.lotusmusicanddance.org/elissaveta-iordanova>,2
<https://pantheon.world/profile/person/Duwa>,0
<https://www.dollsofindia.com/product/apsara-patta-painting-on-palm-leaf-bookmark-SJ88.html>,1
<https://docs.flutter.dev/get-started/install>,0
<https://www.worldatlas.com/articles/what-languages-are-spoken-in-kuwait.html>,0
<https://www.buddhistdoor.net/features/little-did-they-know/>,0
<https://www.feldenkraiswithjen.com/tienda>,0
<https://seasia.co/2022/07/03/top-3-best-selling-cars-2021-in-each-asean-country>,0
https://pantheon.world/profile/person/Ninette_de_Valois,0
<https://www.dollsofindia.com/posters/pictures-with-stands/large/>,1
<https://www.dollsofindia.com/product/wood-sculpture/pen-and-pencil-holder-HC76.html>,1
<https://www.accartbooks.com/us/book/thierry-mugler/>,0
<http://gmpg.org/xfn/creator-fr>,0
<https://www.balletdancersguide.com/career-development-plan-can-i-still-be-a-professional-ballet-dancer.html>,0
<https://www.worldatlas.com/maps/lebanon>,0
<https://lcn.loc.gov/15008911/marxml>,2
<https://onlinebharatanatyam.com/tag/indian-classical-dance/feed/>,0
https://pantheon.world/profile/person/Karla_Souza,0
https://pantheon.world/profile/person/Edward_VII,0
<https://creativecommons.org/licenses/by-nc-nd/4.0/>,0
<https://listverse.com/fact-fiction/books/feed/>,0
<https://www.dancemagazine.com/tag/lou-conte/>,2
<https://www.nytimes.com/sitemap/1989/>,0

<https://github.com/orgs/LibraryOfCongress/people>,0
<https://bucketlistjourney.net/eating-a-century-egg-at-a-thai-market/>,0
https://public.websites.umich.edu/~ac213/student_projects06/dorir/plena.html,0
<https://music.apple.com/gm/browse>,0
<https://kalkbuckmedi21.s3.ap-south-1.amazonaws.com/pdf/regulations/Regulations-Draft.pdf>,0
<https://www.britannica.com/science/malachite-green>,4
<https://www.danceinforma.com/2020/09/30/boston-ballet-reimagines-2020-21-season/>,2
<https://www.diggitmagazine.com/articles/playing-cultural-identity-through-art>,0
<https://danceinforma.us/articles/tag/smuin-contemporary-ballet/>,2
<https://www.culturalindia.net/indian-art/paintings/index.html>,0
https://pantheon.world/profile/person/Phyllis_Coates,0
<https://www.worldchampionproductions.com/event/bronze-class-with-chris-foxtrot/2024-05-07/>,2
<https://www.razzmajazz.com/what-we-do/marching-band/>,0
<https://www.conted.ox.ac.uk/about/pgdip-in-paediatric-infectious-diseases>,0
https://pantheon.world/profile/person/Ella_Maillart,0
<https://nmaahc.si.edu/about/news/national-museum-african-american-history-and-culture-celebrates-black-history-month>,0
<https://www.contemporary-dance.org/choreographic-analysis-from-the-perspective-of-aesthetics.html>,0
<https://www.dollsofindia.com/product/cute-miniature-dolls/ram-bhakt-hanuman-clay-KN59.html>,1
<https://pantheon.world/profile/person/Patanjali>,0
<https://www.dollsofindia.com/read/mahatma-gandhi-pictures.htm>,1
https://pantheon.world/profile/person/Filippo_Taglioni,0
<https://www.fredastaire.com/about/>,2
<https://www.accartbooks.com/us/book/car-racing-1965/>,0
https://pantheon.world/profile/person/Alberto_Santos-Dumont,0
<https://www.britannica.com/browse/Religious-Beliefs/2>,0

Sample Set of Precomputed Clusters for 70K Pages Using Ward's Linkage:

<https://www.powells.com/post/lists/new-literature-in-translation-november-2023>,4
<https://www.givemn.org/help>,1
<https://www.cbsnews.com/news/bison-populations-fort-peck-montana-indian-reservation/>,4
<https://devowl.io/2022/wordpress-calendar-plugins/>,1
<https://www.encyclopedia.com/environment/science-magazines/bee-creek-cave-harvestman>,3
<https://www.britannica.com/question/How-did-Coco-Chanel-become-famous>,3
<https://nmaahc.si.edu/explore/initiatives/history-rebellion-and-reconciliation>,4
<https://www.nytimes.com/2023/11/14/health/long-term-care-resources-caregivers.html>,4
<https://www.britannica.com/topic/Federal-Bureau-of-Investigation>,3
<https://www.youtube.com/embed/CpXOBHDiFD8>,1
<https://code.org/about/2022>,4
<https://pantheon.world/profile/occupation/dancer/country/united-states>,0
<https://dancechanneltv.com/film/education>,1
<https://www.theguardian.com/sport/nba>,1
<http://www.lotusmusicanddance.org/caren-calder>,0
<https://www.youtube.com/channel/UCAuerig2N-RZWJT8x75V9yw>,1
<https://www.danceinforma.com/tag/dance-flooring/>,0
<http://www.hyderabad.org.uk/facts/index.html>,1
<https://www.soulbrazil.com.au/home/feed/>,1
<https://www.diggitmagazine.com/papers/deviantart-and-ai-showdown-between-manual-playbour-and-automated-playbour>,4
<https://www.cbsnews.com/boston/video/wayfair-is-laying-off-more-than-1600-workers/>,4
<https://dancingastronaut.com/2023/11/celebrating-10-years-of-iii-points-under-the-disco-ball-review/>,1
<https://archives.nypl.org/collection/digital>,1

<https://hiphopinternational.com/2016/08/page/2/>,1
https://pantheon.world/profile/person/Andrew_Carnegie,1
<https://seasia.co/2023/09/24/thailand-reverses-course-tightens-control-on-cannabis-use>,4
<https://www.dollsofindia.com/product/mohini-mural-poster-DR29.html>,2
<https://www.diggitmagazine.com/articles/sublime-cannibal-holocaust>,1
<https://www.dollsofindia.com/product/srinathji-krishna-and-sudama-poster-BD23.html>,2
<https://www.britannica.com/topic/The-Great-Gatsby>,3
<https://www.encyclopedia.com/people/science-and-technology/physics-biographies>,3
<https://www.danceadventure.net/tag/rest-and-recovery/>,0
<https://www.cbsnews.com/team/tony-dokoupil/>,4
<https://www.pinterest.com/feiiatrapasueos/>,1
<https://www.britannica.com/money/home-equity>,4
<https://www.encyclopedia.com/arts/educational-magazines/elder-karl-1948>,3
<https://www.danceusa.org/jobsandauditions>,0
<https://www.dictionary.com/browse/deaf>,4
<https://www.encyclopedia.com/humanities/dictionaries-thesauruses-pictures-and-press-releases/foley>,3
<https://www.health.vic.gov.au/public-health>,1
<https://thedemostop.com/blogs/instruments/drums/types-of-snare-drums/>,1
<https://www.learn2dance.com/sell-your-product-on-learn2dance-com/>,0
<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/age-and-fertility>,1
<https://hotjazzjubilee.com/wp-content/uploads/2024/02/HJJ-Sponsorship-Opportunities-2024.pdf>,1
<https://informatika20.sk/>,1
https://pantheon.world/profile/person/Paul_Tergat,1
https://pantheon.world/profile/person/Jan_Twardowski,1
<https://www.dollsofindia.com/product/murlidhar-krishna-stone-dust-statue-PT24.html>,2
<https://ballroomdanceacademy.com/news/this-inspiring-woman-competed-in-the-olympics-after-being-diagnosed-with-cancer/>,0
<https://code.org/educate/weblab>,1
<https://www.divyakasturi.com/press>,1
<https://www.loc.gov/item/05039056/>,0
<https://www.danceshoesstore.com/SERA7030%20232%20Coffee%20Brown%20Crocodile>,1
<https://github.com/premium-support>,1
<https://www.dancemagazine.com/category/news/breaking-stereotypes/page/3/>,0
<https://www.britannica.com/money/Federal-Trade-Commission>,4
<https://www.dollsofindia.com/product/jagannath-balaram-subhadra-with-chariot-wheel-SH55.html>,2
<https://www.pinterest.com/ideas/pop-culture/931853262094/>,1
<https://www.dollsofindia.com/product/2-beaded-small-garlands-for-deity-UK71.html>,2
<https://www.unpublishedzine.com/sex-intimacy-and-just-like-that-sex-and-the-city-taught-me-some-things-about-sex-and-relationships>,4
<https://www.disneyplus.com/cs-cz/series/growing-up/4pPvFiXmJMse>,1
<https://www.dictionary.com/browse/ahoy>,4
<https://www.worldatlas.com/maps/sao-tome-and-principe>,4
https://www.thebetterindia.com/wp-content/plugins/thebetterindia-manager/build/img/icons/close_icon.svg,1
<https://www.bluepencilpublishers.com/product/incomparable-sachin-dev-burman/>,4
[https://www.chickasaw.net/Our-Nation/Locations/Arts-Humanities-\(Abney\)](https://www.chickasaw.net/Our-Nation/Locations/Arts-Humanities-(Abney)),4
<https://www.danceadventure.net/tag/dancing-with-cancer/>,0
<https://www.gotquestions.org/Polski/sluzbie.html>,1
<https://www.britannica.com/story/five-years-later-the-great-sendai-earthquake>,3
<https://www.lotusmusicanddance.org/elissaveta-iordanova>,0
<https://pantheon.world/profile/person/Duwa>,1
<https://www.dollsofindia.com/product/apsara-patta-painting-on-palm-leaf-bookmark-SJ88.html>,2
<https://docs.flutter.dev/get-started/install>,1
<https://www.worldatlas.com/articles/what-languages-are-spoken-in-kuwait.html>,4
<https://www.buddhistdoor.net/features/little-did-they-know/>,4
<https://www.feldenkraiswithjen.com/tienda>,1
<https://seasia.co/2022/07/03/top-3-best-selling-cars-2021-in-each-asean-country>,4

Prediction and Agglomerative Clustering (For any Linkage) Results to Integrate with UI (Collaboration with Sushila):

1. **Relevance Model Selection:** When the user selects a relevance model on the UI, a backend process triggers API's(Node) to retrieve a JSON object from Solr. This object contains an attribute called "docs" containing the top 30 results, ranked in descending order based on the chosen relevance model.
2. **Preprocessing Top Results:** The top 30 pages from Solr are preprocessed, including converting them into TF-IDF vectors as mentioned earlier.
3. **Clustering with Agglomerative Model:** When a user selects Agglomerative clustering with a specific linkage method in the UI, then the relevant Agglomerative model is loaded from a pickle file. The TF-IDF vectors are then clustered using the fit_predict method, which assigns each page to a specific cluster based on content similarity, distance metrics, and the selected linkage method.
4. **Ranking and Integration:** Post-clustering, the pages are ranked to align with the clustering structure. For instance, all relevant pages belonging to the same cluster as the top-ranked result are grouped together and ranked based on their relevance scores (Page rank or HITS scores). This process continues iteratively until the desired threshold, typically 30 pages, is reached.
5. **Response to UI:** The URLs, which are reranked based on the clusters formed with respective clustering IDs, are then sent back as a response to the UI. This integration ensures that users receive a coherent and meaningful display of search results, grouped by content similarity within clusters and ranked by relevance based on the chosen model.

Query Experimentation, Selection, and Result Evaluation Through Clustering

In my experimentation with clustering and query selection, I found that clustering methods significantly enhance result relevance. After testing each clustering method with 50 queries, it became evident that clustering effectively groups relevant data together, leading to reordered ranks that amplify the impact of relevance models like page rank and hits. Interestingly, applying clustering to relevance models resulted in even more pertinent results compared to using relevance models alone.

When comparing flat and agglomerative clustering, I observed distinct differences, particularly in how data is grouped. However, varying the types of linkages in agglomerative clustering did not lead to major changes; only minor adjustments in rankings were noted.

For query selection, I adopted a strategy based on observed clusters in plotted graphs. Notably, I observed that different dance forms clustered together, indicating potential for topic-based searching. Additionally, hits revealed clusters of top or notable dancers, showcasing the effectiveness of clustering in query relevance and topic identification.

In addition to my observations, I manually checked the URLs before and after clustering. It was evident that clustering significantly improved the relevance of the results, making them more meaningful and sensible.

Results of three different Queries:

For every query the initial image would be related to relevance model, then the subsequent images are related to clustering (Flat, Complete, Average, Ward's)

1. Top dancers

Hits Relevance

Dancing Search Engine

Dancing Search

Google

Bing

Relevance Model
☐ Page Rank ☒ HITS

Clustering Option

Query Expansion Option

Top 10 Best Indian Dancers in Bollywood To Follow
<https://www.ipassio.com/blog/indian-dancers>
Top 10 Best Indian Dancers in Bollywood To Follow Explore Courses Search Sign Up Student Sign Up Teacher Sign Up Log In Explore Courses Learn...

Salsa Dancers Perform for NBA Halftime Shows - Salsa Vida
<https://www.salsavida.com/salsa-news/salsa-dancers-perform-for-nba-halftime-shows/>
Salsa Dancers Perform for NBA Halftime Shows - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop News Salsa Dancers Perform for NBA Halftime Shows Takeshi Young April 15,...

Top 13 Salsa Dancing Movies - Salsa Vida
<https://www.salsavida.com/articles/salsa-dancing-movies/>
Top 13 Salsa Dancing Movies - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Articles Top 13 Salsa Dancing Movies By Takeshi Young Salsa dancing has caught the attention...

History of Salsa Dance: Origins of Salsa - Salsa Vida
<https://www.salsavida.com/articles/history-of-salsa-dance/>
History of Salsa Dance: Origins of Salsa - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Articles History of Salsa Dance By Takeshi Young Origins of Salsa Dance Salsa dancing...

Top 11 Salsa Competitions in the World - Salsa Vida
<https://www.salsavida.com/articles/top-international-salsa-competitions/>
Top 11 Salsa Competitions in the World - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Articles Top 11 Salsa Competitions in the World By Shakun Jain So you...

SPONSORS & MEDIA – world dance movement
<https://worlddancemovement.com/sponsors/>
SPONSORS & MEDIA – world dance movement Skip to content +1 212.582.1090 | +39 380 4962634 — info@worlddancemovement.com Main Menu About Us Menu Toggle About...

Dancer Jaycee Wilkins Diagnosed with Perthes Disease
<https://www.danceinforma.com/2015/11/18/dance-prodigy-jaycee-wilkins-diagnosed-with-perthes-disease/comment-page-1/>
Dancer Jaycee Wilkins Diagnosed with Perthes Disease AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips...

FLAT CLUSTERING

Dancing Search Engine

Relevance Model
☐ Page Rank ☒ HITS

Clustering Option

Query Expansion Option

Top 10 Best Indian Dancers in Bollywood To Follow
<https://www.ipassio.com/blog/indian-dancers> | Cluster ID: 5
Top 10 Best Indian Dancers in Bollywood To Follow Explore Courses Search Sign Up Student Sign Up Teacher Sign Up Log In Explore Courses Learn...

Salsa Dancers Perform for NBA Halftime Shows - Salsa Vida
<https://www.salsavida.com/salsa-news/salsa-dancers-perform-for-nba-halftime-shows/> | Cluster ID: 5
Salsa Dancers Perform for NBA Halftime Shows - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop News Salsa Dancers Perform for NBA Halftime Shows Takeshi Young April 15,...

Top 13 Salsa Dancing Movies - Salsa Vida
<https://www.salsavida.com/articles/salsa-dancing-movies/> | Cluster ID: 5
Top 13 Salsa Dancing Movies - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Articles Top 13 Salsa Dancing Movies By Takeshi Young Salsa dancing has caught the attention...

History of Salsa Dance: Origins of Salsa - Salsa Vida
<https://www.salsavida.com/articles/history-of-salsa-dance/> | Cluster ID: 5
History of Salsa Dance: Origins of Salsa - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Articles History of Salsa Dance By Takeshi Young Origins of Salsa Dance Salsa dancing...

SPONSORS & MEDIA – world dance movement
<https://worlddancemovement.com/sponsors/> | Cluster ID: 5
SPONSORS & MEDIA – world dance movement Skip to content +1 212.582.1090 | +39 380 4962634 — info@worlddancemovement.com Main Menu About Us Menu Toggle About...

Dancer Jaycee Wilkins Diagnosed with Perthes Disease
<https://www.danceinforma.com/2015/11/18/dance-prodigy-jaycee-wilkins-diagnosed-with-perthes-disease/comment-page-1/> | Cluster ID: 5
Dancer Jaycee Wilkins Diagnosed with Perthes Disease AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips...

McDonald Selznick Associates young dancers - Dance Informa Magazine
<https://www.danceinforma.com/2020/09/12/mcdonald-selznick-associates-creates-an-online-lifeline-for-young-dancers/> | Cluster ID: 5
McDonald Selznick Associates young dancers - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance...

@modelsdoingballet on misrepresenting ballet - Dance Informa Magazine
<https://www.danceinforma.com/2022/05/26/modelsdoingballet-on-misrepresenting-ballet-in-media-and-how-easy-it-is-not-to/> | Cluster ID: 5

The image reveals clusters where similar results are grouped together, each displaying its cluster ID in the UI.

Agglomerative Clustering (Complete):

Dancing Search Engine

Relevance Model
☐ Page Rank ☒ HITS

Clustering Option

Query Expansion Option

[Top 10 Best Indian Dancers in Bollywood To Follow](#)
<https://www.ipassio.com/blog/indian-dancers> | Cluster ID: 2
Top 10 Best Indian Dancers in Bollywood To Follow Explore Courses Search Sign Up Student Sign Up Teacher Sign Up Log In Explore Courses Learn...

[Dancer Jaycee Wilkins Diagnosed with Perthes Disease](#)
<https://www.danceinforma.com/2015/11/18/dance-prodigy-jaycee-wilkins-diagnosed-with-perthes-disease/comment-page-1/> | Cluster ID: 2
Dancer Jaycee Wilkins Diagnosed with Perthes Disease AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips...

[McDonald Selznick Associates young dancers - Dance Informa Magazine](#)
<https://www.danceinforma.com/2020/09/12/mcdonald-selznick-associates-creates-an-online-lifeline-for-young-dancers/> | Cluster ID: 2
McDonald Selznick Associates young dancers - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance...

[The Winners of the Inaugural Open Call Nationals - Dance Informa Magazine](#)
<https://www.danceinforma.com/2013/09/04/the-winners-of-the-inaugural-open-call-nationals/> | Cluster ID: 2
The Winners of the Inaugural Open Call Nationals - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact...

[All Roads Lead to Dance for Billy Mustapha - Dance Advantage](#)
<https://www.danceadvantage.net/billy-mustapha/> | Cluster ID: 2
All Roads Lead to Dance for Billy Mustapha - Dance Advantage Skip to primary navigation Skip to main content Skip to primary sidebar Dance...

[12 Traits of Terrific Dance Teachers - Dance Advantage](#)
<https://www.danceadvantage.net/great-dance-teachers/> | Cluster ID: 2
12 Traits of Terrific Dance Teachers - Dance Advantage Skip to primary navigation Skip to main content Skip to primary sidebar Dance Advantage Solutions For...

[Salsa Dancers Perform for NBA Halftime Shows - Salsa Vida](#)
<https://www.salsavida.com/salsa-news/salsa-dancers-perform-for-nba-halftime-shows/> | Cluster ID: 1
Salsa Dancers Perform for NBA Halftime Shows - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop News Salsa Dancers Perform for NBA Halftime Shows Takeshi Young April 15,...

[Top 13 Salsa Dancing Movies - Salsa Vida](#)
<https://www.salsavida.com/articles/salsa-dancing-movies/> | Cluster ID: 1
Top 13 Salsa Dancing Movies - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Articles Top 13 Salsa Dancing Movies By Takeshi Young Salsa dancing has caught the attention...

It's noticeable that certain URLs, which are closely related, are prioritized and moved to the top of the results. Specifically, when searching for top dancers, we obtained names of prominent dancers, and their corresponding cluster IDs were noted.

Agglomerative Clustering (Average):

Dancing Search Engine

Relevance Model
☐ Page Rank
☒ HITS

Clustering Option

Agglomerative Average Link Clustering

Query Expansion Option

None

[Top 10 Best Indian Dancers in Bollywood To Follow](#)
<https://www.ipassio.com/blog/indian-dancers> | Cluster ID: 0
Top 10 Best Indian Dancers in Bollywood To Follow Explore Courses Search Sign Up Student Sign Up Teacher Sign Up Log In Explore Courses Learn...

[Dancer Jaycee Wilkins Diagnosed with Perthes Disease](#)
<https://www.danceinforma.com/2015/11/18/dance-prodigy-jaycee-wilkins-diagnosed-with-perthes-disease/comment-page-1/> | Cluster ID: 0
Dancer Jaycee Wilkins Diagnosed with Perthes Disease AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips...

[McDonald Selznick Associates young dancers - Dance Informa Magazine](#)
<https://www.danceinforma.com/2020/09/12/mcdonald-selznick-associates-creates-an-online-lifeline-for-young-dancers/> | Cluster ID: 0
McDonald Selznick Associates young dancers - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance...

[The Winners of the Inaugural Open Call Nationals - Dance Informa Magazine](#)
<https://www.danceinforma.com/2013/09/04/the-winners-of-the-inaugural-open-call-nationals/> | Cluster ID: 0
The Winners of the Inaugural Open Call Nationals - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact...

[Martha Graham Dance Company Archives - Dance Informa Magazine](#)
<https://www.danceinforma.com/tag/martha-graham-dance-company/> | Cluster ID: 0
Martha Graham Dance Company Archives - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance...

[Capezio Archives - Dance Informa Magazine](#)
<https://www.danceinforma.com/tag/capezio/> | Cluster ID: 0
Capezio Archives - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips &...

[All Roads Lead to Dance for Billy Mustapha - Dance Advantage](#)
<https://www.danceadvantage.net/billy-mustapha/> | Cluster ID: 0
All Roads Lead to Dance for Billy Mustapha - Dance Advantage Skip to primary navigation Skip to main content Skip to primary sidebar Dance...

[12 Traits of Terrific Dance Teachers - Dance Advantage](#)
<https://www.danceadvantage.net/great-dance-teachers/> | Cluster ID: 0
12 Traits of Terrific Dance Teachers - Dance Advantage Skip to primary navigation Skip to main content Skip to primary sidebar Dance Advantage Solutions For...

In comparison to the previous clustering, the rankings of two additional URLs, Martha and Capezio, have been elevated to the top, and their cluster IDs were noted.

Agglomerative Clustering (Ward's):

Dancing Search Engine

top dancers

Search

Dancing Search

Google

Bing

Relevance Model

☐ Page Rank

☒ HITS

Clustering Option

Agglomerative Ward Link Clustering

Query Expansion Option

None

[Top 10 Best Indian Dancers in Bollywood To Follow](#)

https://www.ipassio.com/blog/indian-dancers | Cluster ID: 0

Top 10 Best Indian Dancers in Bollywood To Follow Explore Courses Search Sign Up Student Sign Up Teacher Sign Up Log In Explore Courses Learn...

[SPONSORS & MEDIA – world dance movement](#)

https://worlddancemovement.com/sponsors/ | Cluster ID: 0

SPONSORS & MEDIA – world dance movement Skip to content +1 212.582.1090 | +39 380 4962634 — info@worlddancemovement.com Main Menu About Us Menu Toggle About...

[Dancer Jaycee Wilkins Diagnosed with Perthes Disease](#)

https://www.danceinforma.com/2015/11/18/dance-prodigy-jaycee-wilkins-diagnosed-with-perthes-disease/comment-page-1/ | Cluster ID: 0

Dancer Jaycee Wilkins Diagnosed with Perthes Disease AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips...

[McDonald Selznick Associates young dancers - Dance Informa Magazine](#)

https://www.danceinforma.com/2020/09/12/mcdonald-selznick-associates-creates-an-online-lifeline-for-young-dancers/ | Cluster ID: 0

McDonald Selznick Associates young dancers - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance...

[The Winners of the Inaugural Open Call Nationals - Dance Informa Magazine](#)

https://www.danceinforma.com/2013/09/04/the-winners-of-the-inaugural-open-call-nationals/ | Cluster ID: 0

The Winners of the Inaugural Open Call Nationals - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact...

[Martha Graham Dance Company Archives - Dance Informa Magazine](#)

https://www.danceinforma.com/tag/martha-graham-dance-company/ | Cluster ID: 0

Martha Graham Dance Company Archives - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance...

[Capezio Archives - Dance Informa Magazine](#)

https://www.danceinforma.com/tag/capezio/ | Cluster ID: 0

Capezio Archives - Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips & Advice Dance Health Teacher Tips & Resources Dance Studio Owner Contact Us About Disclaimer Advertise Directories AUS Magazine UK Magazine Dance Informa Magazine AUDITIONS EVENTS Giveaways! Tips &...

[All Roads Lead to Dance for Billy Mustapha - Dance Advantage](#)

https://www.danceadvantage.net/billy-mustapha/ | Cluster ID: 0

All Roads Lead to Dance for Billy Mustapha - Dance Advantage Skip to primary navigation Skip to main content Skip to primary sidebar Dance...

In contrast to previous results, another URL, Sponsors and Media, has been promoted to the top rank. Upon clicking, it was discovered to be related to world dancers. These observations strongly indicate that clustering has significantly enhanced the quality of results.

2. Topic Based (Salsa Dance):

Page Rank

Dancing Search Engine

Relevance Model

☒ Page Rank ☐ HITS

Clustering Option

Query Expansion Option

Salsa Dance Videos - Salsa Vida

<https://www.salsavida.com/category/videos/>

Salsa Dance Videos - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida team Videos Salsa Dancing Robot Read More 0 Videos Obi-Wan...

About Salsa Dance

https://www.danceshoesstore.com/About-Salsa-Dance_ep_55-1.html

About Salsa Dance Home Contact Us My Account Policies About Us Login or Register Shopping Cart home Toggle navigation Search 0 Items Items Qty. Price Subtotal: View Cart Checkout Ladies' Shoes Ladies' Latin, Rhythm & Salsa Ladies' Standard & Smooth Ladies'...

Salsa Dance Terms - Salsa Vida

<https://www.salsavida.com/salsa-dance-terms/>

Salsa Dance Terms - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Salsa Dance Terms Learning how to dance salsa is challenging enough, and when you...

Salsa Dance Videos - Salsa Vida

<https://www.salsavida.com/category/videos/feed/>

Salsa Dance Videos - Salsa Vida Salsa Dance Videos - Salsa Vida Your guide to the salsa dancing lifestyle Salsa Dancing Robot Song:...

Comments on: Salsa Dance Terms

<https://www.salsavida.com/salsa-dance-terms/feed/>

Comments on: Salsa Dance Terms Comments on: Salsa Dance Terms Your guide to the salsa dancing lifestyle

Comments on: History of Salsa Dance

<https://www.worldchampionproductions.com/2021/11/22/history-of-salsa-dance/feed/>

Comments on: History of Salsa Dance Comments on: History of Salsa Dance Nashville Dance Lessons for Beginners and Salsa Dance Lessons

History of Salsa Dance | World Champion Productions

<https://www.worldchampionproductions.com/2021/11/22/history-of-salsa-dance/>

History of Salsa Dance | World Champion Productions Gift Certificates Dance Lessons Private Dance Lessons Group Dance Lessons Ballroom Dance Lessons Salsa Dance Lessons Wedding Dance Lessons Parties...

After applying pagerank we can see we got urls based on pagerank score and similarity score.

Flat Clustering

Dancing Search Engine

salsa dance

Search

Dancing Search

Google

Bing

Relevance Model

☒ Page Rank

☐ HITS

Clustering Option

Flat Clustering

Query Expansion Option

None

[Salsa Dance Videos - Salsa Vida](#)

https://www.salsavida.com/category/videos/ | Cluster ID: 2

Salsa Dance Videos - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida team Videos Salsa Dancing Robot Read More 0 Videos Obi-Wan...

[Salsa Dance Videos - Salsa Vida](#)

https://www.salsavida.com/category/videos/feed/ | Cluster ID: 2

Salsa Dance Videos - Salsa Vida Salsa Dance Videos - Salsa Vida Your guide to the salsa dancing lifestyle Salsa Dancing Robot Song:...

[SJSU Spartan Mambo - Collegiate Salsa Dance Team](#)

https://www.spartanmambo.com/ | Cluster ID: 2

SJSU Spartan Mambo - Collegiate Salsa Dance Team Spartan Mambo San José State University's Performance Salsa Team Search Main menu Skip to primary content Skip to...

[About Salsa Dance](#)

https://www.danceshoesstore.com/About-Salsa-Dance_ep_55-1.html | Cluster ID: 5

About Salsa Dance Home Contact Us My Account Policies About Us Login or Register Shopping Cart home Toggle navigation Search 0 Items Items Qty. Price Subtotal: View Cart Checkout Ladies' Shoes Ladies' Latin, Rhythm & Salsa Ladies' Standard & Smooth Ladies'...

[Salsa Dance Terms - Salsa Vida](#)

https://www.salsavida.com/salsa-dance-terms/ | Cluster ID: 5

Salsa Dance Terms - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Salsa Dance Terms Learning how to dance salsa is challenging enough, and when you...

[Comments on: Salsa Dance Terms](#)

https://www.salsavida.com/salsa-dance-terms/feed/ | Cluster ID: 5

Comments on: Salsa Dance Terms Comments on: Salsa Dance Terms Your guide to the salsa dancing lifestyle

[Comments on: History of Salsa Dance](#)

https://www.worldchampionproductions.com/2021/11/22/history-of-salsa-dance/feed/ | Cluster ID: 5

Comments on: History of Salsa Dance Comments on: History of Salsa Dance Nashville Dance Lessons for Beginners and Salsa Dance Lessons

Upon applying flat clustering, noticeable improvements were observed in certain URLs' rankings. For example, relevant URLs related to salsa, such as Salsa Vida and Salsa Dance Team, were pushed up in rank as they were associated with the same clusters.

Agglomerative Clustering (Average):

Dancing Search Engine

Relevance Model
☒ Page Rank ☐ HITS

Clustering Option

Query Expansion Option

Salsa Dance Videos - Salsa Vida
<https://www.salsavida.com/category/videos/> | Cluster ID: 3
Salsa Dance Videos - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida team Videos Salsa Dancing Robot Read More 0 Videos Obi-Wan...

Amazing Salsa Dance on a Cliff - Salsa Vida
<https://www.salsavida.com/videos/amazing-salsa-dance-cliff-vente-negra/> | Cluster ID: 3
Amazing Salsa Dance on a Cliff - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Amazing Salsa Dance on a Cliff Takeshi Young August 11, 2020 <https://www.youtube.com/watch?v=pbvdMvs8FRY> Video can't...

Unidad | July 4th Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/unidad-july-4th-salsa-dance-video/> | Cluster ID: 3
Unidad | July 4th Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Unidad | July 4th Salsa Dance Video Takeshi Young July 4,...

Salsa Dance Videos- Page 2 of 2 - Salsa Vida
<https://www.salsavida.com/category/videos/page/2/> | Cluster ID: 3
Salsa Dance Videos- Page 2 of 2 - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida...

Oh Qué Será? - Willie Colón | Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/oh-que-sera-willie-colon-salsa-dance-video/> | Cluster ID: 3
Oh Qué Será? - Willie Colón | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Oh Qué Será? - Willie Colón...

Salsa Dancing in San Francisco | Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/salsa-dancing-in-san-francisco-salsa-dance-video/> | Cluster ID: 3
Salsa Dancing in San Francisco | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Salsa Dancing in San Francisco | Salsa...

Sin Tecnica No Hay Tecnica | Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/sin-tecnica-no-hay-tecnica-salsa-dance-video/> | Cluster ID: 3
Sin Tecnica No Hay Tecnica | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Sin Tecnica No Hay Tecnica | Salsa...

Some more urls are rank pushed again and their respective cluster id is shown.

Agglomerative Clustering (Ward's):

Relevance Model
☒ Page Rank ☐ HITS

Clustering Option

Query Expansion Option

Salsa Dance Videos - Salsa Vida
<https://www.salsavida.com/category/videos/> | Cluster ID: 1
Salsa Dance Videos - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida team Videos Salsa Dancing Robot Read More 0 Videos Obi-Wan...

Amazing Salsa Dance on a Cliff - Salsa Vida
<https://www.salsavida.com/videos/amazing-salsa-dance-cliff-vente-negra/> | Cluster ID: 1
Amazing Salsa Dance on a Cliff - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Amazing Salsa Dance on a Cliff Takeshi Young August 11, 2020 <https://www.youtube.com/watch?v=pbvdMvs8FRY> Video can't...

Unidad | July 4th Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/unidad-july-4th-salsa-dance-video/> | Cluster ID: 1
Unidad | July 4th Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Unidad | July 4th Salsa Dance Video Takeshi Young July 4,...

Salsa Dance Videos- Page 2 of 2 - Salsa Vida
<https://www.salsavida.com/category/videos/page/2/> | Cluster ID: 1
Salsa Dance Videos- Page 2 of 2 - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida...

Oh Qué Será? - Willie Colón | Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/oh-que-sera-willie-colon-salsa-dance-video/> | Cluster ID: 1
Oh Qué Será? - Willie Colón | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Oh Qué Será? - Willie Colón...

Salsa Dancing in San Francisco | Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/salsa-dancing-in-san-francisco-salsa-dance-video/> | Cluster ID: 1
Salsa Dancing in San Francisco | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Salsa Dancing in San Francisco | Salsa...

Sin Tecnica No Hay Tecnica | Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/sin-tecnica-no-hay-tecnica-salsa-dance-video/> | Cluster ID: 1
Sin Tecnica No Hay Tecnica | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Sin Tecnica No Hay Tecnica | Salsa...

Justicia - Eddie Palmieri & Ismael Quintana | Salsa Dance Video - Salsa Vida
<https://www.salsavida.com/videos/justicia-eddie-palmieri-ismael-quintana-salsa-dance-video/> | Cluster ID: 1
Justicia - Eddie Palmieri & Ismael Quintana | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Justicia - Eddie Palmieri &...

There is not much difference between previous linkage and this linkage because they are clustered similarly but their difference is seen in lower ranked pages.

Agglomerative Clustering (Complete):

salsa dance

Search

Dancing Search

Google

Bing

Relevance Model

☒ Page Rank

☐ HITS

Clustering Option

Agglomerative Complete Link Clustering

Query Expansion Option

None

Salsa Dance Videos - Salsa Vida

https://www.salsavida.com/category/videos/ | Cluster ID: 3

Salsa Dance Videos - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida team Videos Salsa Dancing Robot Read More 0 Videos Obi-Wan...

Amazing Salsa Dance on a Cliff - Salsa Vida

https://www.salsavida.com/videos/amazing-salsa-dance-cliff-vente-negra/ | Cluster ID: 3

Amazing Salsa Dance on a Cliff - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Amazing Salsa Dance on a Cliff Takeshi Young August 11, 2020 https://www.youtube.com/watch?v=pbvdMvs8FRY Video can't...

Unidad | July 4th Salsa Dance Video - Salsa Vida

https://www.salsavida.com/videos/unidad-july-4th-salsa-dance-video/ | Cluster ID: 3

Unidad | July 4th Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Unidad | July 4th Salsa Dance Video Takeshi Young July 4,...

Salsa Dance Videos- Page 2 of 2 - Salsa Vida

https://www.salsavida.com/category/videos/page/2/ | Cluster ID: 3

Salsa Dance Videos- Page 2 of 2 - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Posts in category Videos Salsa dance videos from the Salsa Vida...

Oh Qué Será? - Willie Colón | Salsa Dance Video - Salsa Vida

https://www.salsavida.com/videos/oh-que-sera-willie-colon-salsa-dance-video/ | Cluster ID: 3

Oh Qué Será? - Willie Colón | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Oh Qué Será? - Willie Colón...

Salsa Dancing in San Francisco | Salsa Dance Video - Salsa Vida

https://www.salsavida.com/videos/salsa-dancing-in-san-francisco-salsa-dance-video/ | Cluster ID: 3

Salsa Dancing in San Francisco | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Salsa Dancing in San Francisco | Salsa...

Sin Tecnica No Hay Tecnica | Salsa Dance Video - Salsa Vida

https://www.salsavida.com/videos/sin-tecnica-no-hay-tecnica-salsa-dance-video/ | Cluster ID: 3

Sin Tecnica No Hay Tecnica | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Sin Tecnica No Hay Tecnica | Salsa...

Justicia - Eddie Palmieri & Ismael Quintana | Salsa Dance Video - Salsa Vida

https://www.salsavida.com/videos/justicia-eddie-palmieri-ismael-quintana-salsa-dance-video/ | Cluster ID: 3

Justicia - Eddie Palmieri & Ismael Quintana | Salsa Dance Video - Salsa Vida Home News Articles Videos Salsa Dance Terms Shop Videos Justicia - Eddie Palmieri &...

It is observed that compared to flat clustering, agglomerative clustering methods are providing even more prominent results.

3. Asian Dance

Page Rank

Dancing Search Engine

Relevance Model
☒ Page Rank ☐ HITS

Clustering Option

Query Expansion Option

[South Asian Dance Equity \(SADE\)](#)
<https://royalholloway.ac.uk/research-and-teaching/departments-and-schools/drama-theatre-and-dance/research/sade/>
South Asian Dance Equity (SADE) Skip to main content Menu Toggle Royal Holloway University of London Studying Here Student Life Research & Teaching About us Studying Here Find your...

[What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/akademi-resources/what-is-south-asian-dance/>
What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects News +...

[Akademi - South Asian Dance in the UK](#)
<https://www.akademi.co.uk/>
Akademi - South Asian Dance in the UK Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects News...

[Bollywood - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/bollywood/>
Bollywood - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Kalaripayattu - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/kalaripayattu/>
Kalaripayattu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Garba - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/garba/>
Garba - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Bihu - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/bihu/>
Bihu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Bharatanatyam - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/bharatanatyam/>
Bharatanatyam - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

We can see got results related to Asian dances, when PageRank relevance is used.

Flat Clustering

Dancing Search Engine

Relevance Model
☒ Page Rank ☐ HITS

Clustering Option

Query Expansion Option

[South Asian Dance Equity \(SADE\)](#)
<https://royalholloway.ac.uk/research-and-teaching/departments-and-schools/drama-theatre-and-dance/research/sade/> | Cluster ID: 5
South Asian Dance Equity (SADE) Skip to main content Menu Toggle Royal Holloway University of London Studying Here Student Life Research & Teaching About us Studying Here Find your...

[What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/akademi-resources/what-is-south-asian-dance/> | Cluster ID: 5
What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects News +...

[Akademi - South Asian Dance in the UK](#)
<https://www.akademi.co.uk/> | Cluster ID: 5
Akademi - South Asian Dance in the UK Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects News...

[Bollywood - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/bollywood/> | Cluster ID: 5
Bollywood - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Kalaripayattu - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/kalaripayattu/> | Cluster ID: 5
Kalaripayattu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Garba - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/garba/> | Cluster ID: 5
Garba - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Bihu - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/bihu/> | Cluster ID: 5
Bihu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

[Bharatanatyam - What is South Asian Dance? - Akademi](#)
<https://www.akademi.co.uk/bharatanatyam/> | Cluster ID: 5
Bharatanatyam - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

We don't see order change of results in top pages but, the lower pages are reranked based on similar clusters.

Agglomerative Clustering (Average):

Dancing Search Engine

asian dance

Search

Dancing Search

Google

Bing

Relevance Model

Page Rank

HITS

Clustering Option

Agglomerative Average Link Clustering

Query Expansion Option

None

South Asian Dance Equity (SADE)

https://royalholloway.ac.uk/research-and-teaching/departments-and-schools/drama-theatre-and-dance/research/sade/ | Cluster ID: 1

South Asian Dance Equity (SADE) Skip to main content Menu Toggle Royal Holloway University of London Studying Here Student Life Research & Teaching About us Studying Here Find your...

Akademi presents: A Journey Through South Asian Dance with Holborn Community Association - Special e

https://www.vam.ac.uk/event/O6qJgPBVoPG/akademi-a-journey-through-south-asian-dance-may-2022 | Cluster ID: 1

Akademi presents: A Journey Through South Asian Dance with Holborn Community Association - Special event at V&A South Kensington ...

What is South Asian Dance? - Akademi

https://www.akademi.co.uk/akademi-resources/what-is-south-asian-dance/ | Cluster ID: 5

What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects News +...

Bollywood - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/bollywood/ | Cluster ID: 5

Bollywood - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Kalaripayattu - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/kalaripayattu/ | Cluster ID: 5

Kalaripayattu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Garba - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/garba/ | Cluster ID: 5

Garba - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Bihu - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/bihu/ | Cluster ID: 5

Bihu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Bharatanatyam - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/bharatanatyam/ | Cluster ID: 5

Bharatanatyam - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Certain URLs have been pushed up in rank, and upon manual observation, it is evident that they are clustered correctly.

Agglomerative Clustering (Ward's):

Dancing Search Engine

asian dance

Search

Dancing Search

Google

Bing

Relevance Model

Page Rank

HITS

Clustering Option

Agglomerative Ward Link Clustering

Query Expansion Option

None

South Asian Dance Equity (SADE)

https://royalholloway.ac.uk/research-and-teaching/departments-and-schools/drama-theatre-and-dance/research/sade/ | Cluster ID: 0

South Asian Dance Equity (SADE) Skip to main content Menu Toggle Royal Holloway University of London Studying Here Student Life Research & Teaching About us Studying Here Find your...

Sadler's Wells partners with Akademi for their South Asian Dance Development Programme - Opportuniti

https://www.akademi.co.uk/sadlers-wells-south-asian-dance-development-programme/ | Cluster ID: 0

Sadler's Wells partners with Akademi for their South Asian Dance Development Programme - Opportunities, Projects - Akademi Navigation Skip to content Akademi Quick links Latest What...

#AkademiSupported | South Asian Dance in Britain: Decentring India and Hinducentrism, 19 Jan 2024 -

https://www.akademi.co.uk/sade-project-launch/ | Cluster ID: 0

#AkademiSupported | South Asian Dance in Britain: Decentring India and Hinducentrism, 19 Jan 2024 - Events - Akademi Navigation Skip to content Akademi Quick...

A deep dive into benefits of South Asian Dance in Education and Community settings - Heritage Projec

https://www.akademi.co.uk/benefits-of-sa-dance-in-edcom-settings/ | Cluster ID: 0

A deep dive into benefits of South Asian Dance in Education and Community settings - Heritage Project Blog - Akademi Navigation Skip...

Akademi presents: A Journey Through South Asian Dance with Holborn Community Association - Special e

https://www.vam.ac.uk/event/O6qJgPBVoPG/akademi-a-journey-through-south-asian-dance-may-2022 | Cluster ID: 0

Akademi presents: A Journey Through South Asian Dance with Holborn Community Association - Special event at V&A South Kensington ...

What is South Asian Dance? - Akademi

https://www.akademi.co.uk/akademi-resources/what-is-south-asian-dance/ | Cluster ID: 1

What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects News +...

Bollywood - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/bollywood/ | Cluster ID: 1

Bollywood - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Kalaripayattu - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/kalaripayattu/ | Cluster ID: 1

Kalaripayattu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Garba - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/garba/ | Cluster ID: 1

Garba - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

The use of Ward's linkage has further improved the results, with even more related URLs being pushed up in rank based on variance minimization.

Agglomerative Clustering (Complete):

Dancing Search Engine

asian dance

Search

Dancing Search

Google

Bing

Relevance Model

☒ Page Rank

☐ HITS

Clustering Option

Agglomerative Complete Link Clustering

Query Expansion Option

None

South Asian Dance Equity (SADE)

https://royalholloway.ac.uk/research-and-teaching/departments-and-schools/drama-theatre-and-dance/research/sade/ | Cluster ID: 1

South Asian Dance Equity (SADE) Skip to main content Menu Toggle Royal Holloway University of London Studying Here Student Life Research & Teaching About us Studying Here Find your...

Akademi presents: A Journey Through South Asian Dance with Holborn Community Association - Special e

https://www.vam.ac.uk/event/06qJgPBVoPG/akademi-a-journey-through-south-asian-dance-may-2022 | Cluster ID: 1

Akademi presents: A Journey Through South Asian Dance with Holborn Community Association - Special event at V&A South Kensington ...

What is South Asian Dance? - Akademi

https://www.akademi.co.uk/akademi-resources/what-is-south-asian-dance/ | Cluster ID: 0

What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects News +...

Bollywood - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/bollywood/ | Cluster ID: 0

Bollywood - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Kalaripayattu - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/kalaripayattu/ | Cluster ID: 0

Kalaripayattu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Garba - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/garba/ | Cluster ID: 0

Garba - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Bihu - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/bihu/ | Cluster ID: 0

Bihu - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

Bharatanatyam - What is South Asian Dance? - Akademi

https://www.akademi.co.uk/bharatanatyam/ | Cluster ID: 0

Bharatanatyam - What is South Asian Dance? - Akademi Navigation Skip to content Akademi Quick links Latest What we do For artists Resources Site search Search Go Menu Main menu Home Latest All Events + projects...

It's noticeable that the cluster IDs differ between previous linkages. This is because the top URLs, which were clustered under ID 0 in previous linkages, are now clustered differently, with the top 2 URLs being assigned to cluster ID 1. In summary, it can be concluded that agglomerative clustering methods outperform flat clustering, particularly when combined with relevance models. This integration results in grouping more relevant URLs together, enhancing the overall effectiveness of the clustering approach.