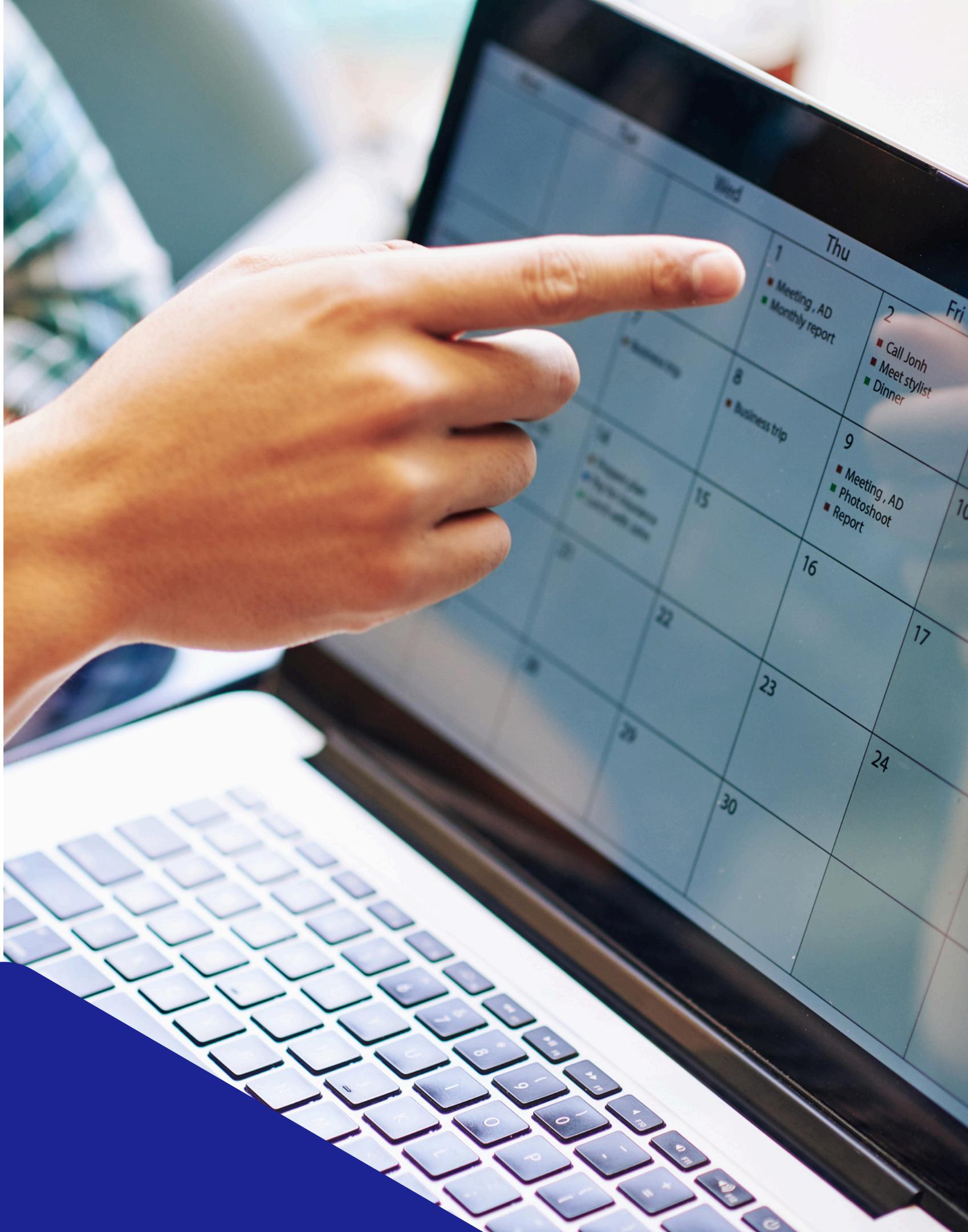


UBC LEARNING ANALYTICS HACKATHON

FALL 2024



THE HEXARIA



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YOUSEF JAFARNIA



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ZHANG**



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02

PROBLEM TO SOLVE

- **Repetitive Questions in Discussion:** Students often raise similar discussion topics, making it difficult to identify recurring themes through manual scanning of the discussion.
- **Improve Teaching Efficiency:** Instructors are often asked to address the same questions repeatedly on Canvas Discussion

“

SOLUTIONS

- **Build “Keyword Filter & Search” Feature :** Introduce a feature to filter discussion topics by specific keywords.
- **Build “Suggesting Similar Discussions” Feature:** Allow users to read related posts from the discussion history

METHODOLOGY

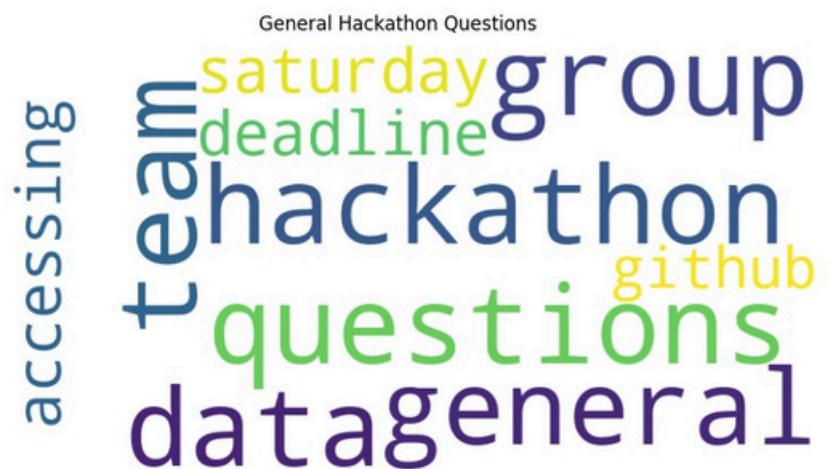
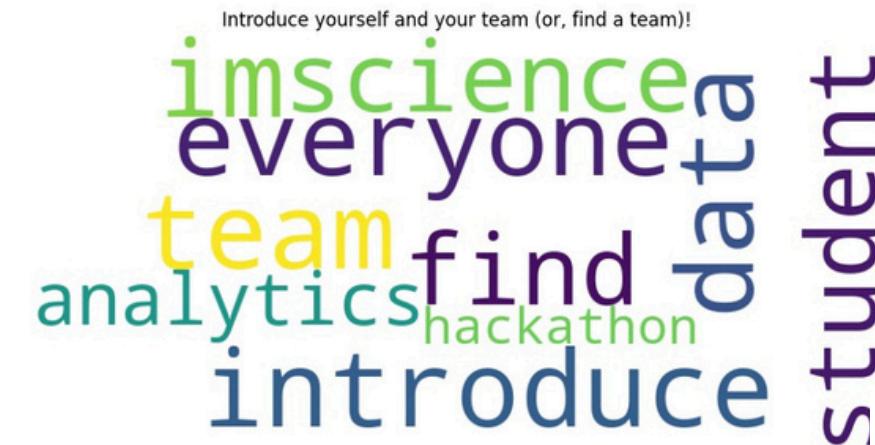
Profiling Each Discussion Based on the information retrieved from APIs

Calculating Some Basic Attributes for each Discussion (Reply Depth, # of Replies, ...)

Concatenating All Texts of the Discussion and Perform Text Cleansing

Finding the top Keywords of each Discussion Based on TF-IDF and word2vec model

Similarity Use Cases Based on the Keywords

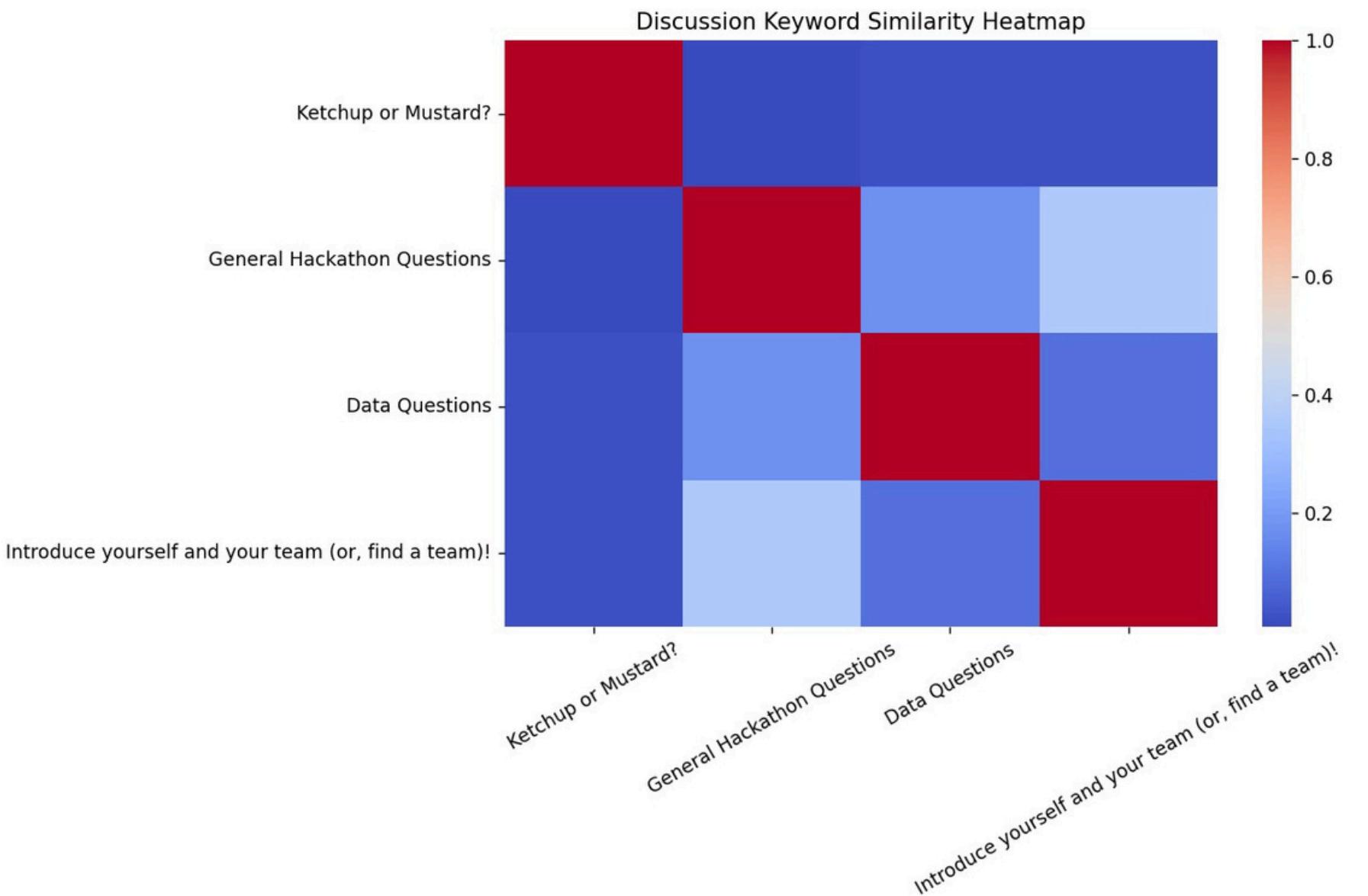


DATA VISUALIZATION

Similarity Score for each Keywords

| Input Word | Similar Word | Similarity Score |
|------------|--------------|------------------|
| mustard | ketchup | 0.994905 |
| mustard | tangy | 0.992019 |
| ketchup | mustard | 0.994905 |
| ketchup | taste | 0.993685 |
| fries | sandwiches | 0.997440 |
| fries | great | 0.997238 |

Heatmap for Similarity with Discussion



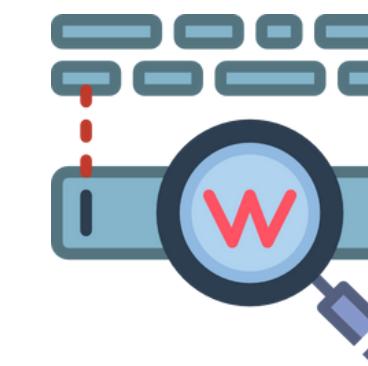
STUDENT USER JOURNEY



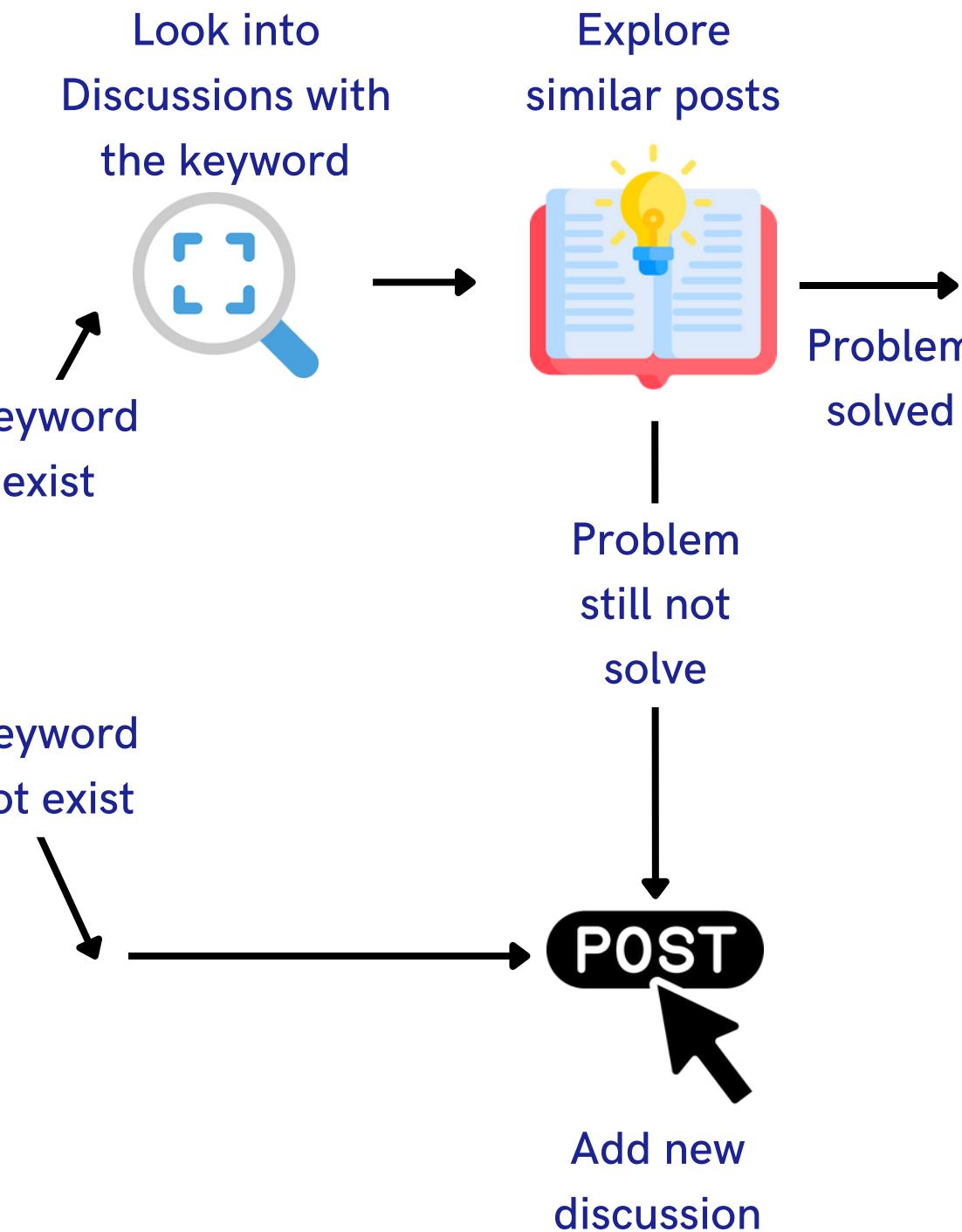
I have a question!



Go to Canvas discussion



Search for the keywords



UIUX DESIGN

Build “Keyword Filter&Search” Feature

Before students begin searching for questions, a “keyword” section will display the top keywords. This provides students with quick access to popular topics, making it easier to search for commonly discussed questions.

Benefits

Make it easier for both instructors and students to view discussions grouped under common themes.

Step 1: Search for Keyword in Discussion

The screenshot shows a user interface for a discussion board. On the left is a vertical sidebar with icons for Home, Modules, Discussions (which is selected), Announcements, and Assignments. The main area has a header "hack-la-24 > Discussions". Below the header is a search bar with a dropdown menu set to "All". To the right of the search bar is a text input field containing "Typing ‘Keyword 4’ to search here ...". Below the search bar are three blue buttons labeled "Keyword1", "Keyword2", and "Keyword3". A pop-up list titled "Pinned Discussions" appears, showing two items: "Discussion A containing ‘Keyword 4’" and "Discussion B containing ‘Keyword 4’". Both items have a yellow star icon and a cursor icon pointing at them. In the bottom right corner of the main area, there are two small numbers: "9" and "21".

Step 2: If student select “Keyword 1”

The screenshot shows three examples of discussion posts. Each post has a dark blue header with the title and a light blue footer with a "Reply" button and a "Keyword 1" button. The first two posts are labeled "Discussion A" and "Discussion B", both titled "Ketchup or Mustard?". The third post is labeled "Discussion C" and also titled "Ketchup or Mustard?". The text in the posts and footers is identical: "Do you prefer ketchup or mustard? Why?". The "Discussion C" post is preceded by the text "filtered out".

UIUX DESIGN

Build "Find Similar Discussions"

Feature

This feature allows students to discover related posts while browsing a specific discussion or when creating a new discussion.

Benefits

1. Expands students' learning by exploring relevant posts.
2. Reduces repetitive questions, allowing instructors to focus on answering new and unique questions to improve teaching efficiency.

Scenario one: While browsing a specific discussion...

The screenshot shows a university discussion board interface. On the left is a vertical sidebar with icons for Home, Modules, Discussions (which is selected), Announcements, Assignments, Grades, People, and Pages. The main area shows a discussion titled "Ketchup or Mustard?" with the question "Do you prefer ketchup or mustard? Why?". Below the question are two buttons: "Reply" and "Find Similar Discussion". A mouse cursor is hovering over the "Find Similar Discussion" button. A callout bubble from this button contains the text "Suggesting similar topic from past discussions..." and "No similar discussion found". The top navigation bar includes the UBC logo, the course code "hack-la-24 > Discussions > Ketchup or Mustard?", a search bar, and filters for "All" and "Sort". The bottom right corner of the main area shows "30 Replies, 19 Unread".

Scenario two: Before posting a new discussion...

The screenshot shows a discussion board interface where a new post is being created. The "Topic Title" field contains "Hackathon". The rich text editor toolbar includes "Edit", "View", "Insert", "Format", "Tools", "Table", "12pt", "Paragraph", and various styling options like bold, italic, underline, and superscript. The main text area of the post contains the question "How can you ace a hackathon? ✨". A callout bubble from this text area suggests "Suggesting similar topic from past discussions..." and lists three items: "What are the key strategies to succeed in a hackathon?", "How do you perform your best at a hackathon?", and "What are the best tips for winning a hackathon?". To the right of the post, a box contains the text "Check similar discussion before posting" and "How do you perform your best at a hackathon?". A "Reply" button is also present in this box. A large blue arrow points from the "Find Similar Discussion" button in the first scenario to the "Check similar discussion before posting" box in this scenario.

FUTURE VISION

Creating The Discussion Archive Section on CANVAS and using the accumulated knowledge of past to improve the efficiency of the future

Filtering Discussions of the Course History

- Having High Reply Count or High Reply Depth
- Eliminating Coursework Elements from Keywords (coursework stop words)

Calculating the Number of Repeat Throughout the History

- Using n (like 5) keywords match to Find the list of Similar Discussions
- Counting the Number of Similar Discussions as the FOM for Repeat

Suggesting the Candidates for Archive

- Rank the Most Repeated Discussions for the Suggestion List
- Get the Instructors Decision on the Archive Posts at the end of the Course

Publishing the Discussion as Archive

- Anonymize the Decided Discussions for Archive
- Show the Archived Discussion in the new Archive Discussion Tab
- Provide the Discussion in the Search Result when creating new Discussions

UIUX DESIGN - FUTURE VERSION

ae

Archived Discussion

Selected discussions from professors, more credible and valuable

Discussion

Other related discussions

Topic Title

Hackathon

Edit View Insert Format Tools Table

12pt ▾ Paragraph ▾ B I U A ▾ ▾ T² ▾

How can you ace a hackathon? ✨



10

hack-la-24 > Discussions

2024W1_V

Home

Modules

Discussions

Announcements

Assignments

Grades

People

Pages

Syllabus

Quizzes

at

readz

All

▼



+ Discussion



Keyword 1

Keyword 2

Keyword 3

Archived Discussion

Introduce yourself and your team (or, find a team)!

14

21



Keyword 1 Keyword 3

Ordered by Recent Activity

Discussions

Ketchup or Mustard?

19

30



Data Questions

Keyword 1

3

3



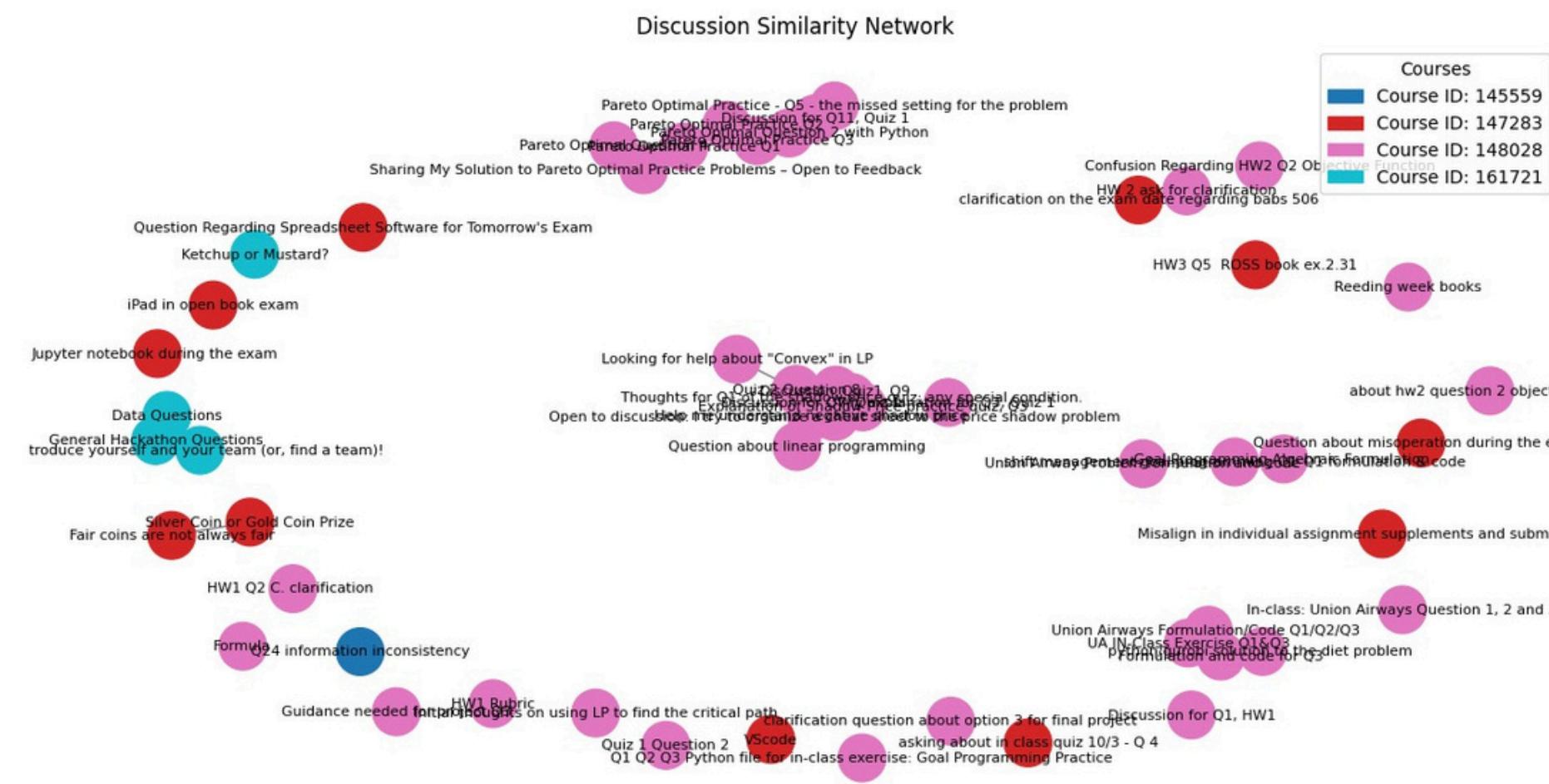
Those red color are from the Archived Discussion.

The black ones are normal previous discussions.



**THANK
YOU**

Network Plot for Discussions



Data Retrieved from Canvas API

| <input type="checkbox"/> Discussion Content | <input type="checkbox"/> # Number_of_Entry_Replies | <input type="checkbox"/> Combined_Message | <input type="checkbox"/> # Max_Depth_of_Entry | <input type="checkbox"/> Cleaned_combined | <input type="checkbox"/> top_keyword_tfidf |
|--|--|--|---|---|--|
| Missing: 0 (0%) | Missing: 0 (0%) | Missing: 0 (0%) | Missing: 0 (0%) | Missing: 0 (0%) | Missing: 0 (0%) |
| Distinct: 55 (100%) | Distinct: 8 (15%) | Distinct: 55 (100%) | Distinct: 5 (9%) | Distinct: 55 (100%) | Distinct: 55 (100%) |
| 55 Distinct values | 55 Distinct values | 55 Distinct values | 55 Distinct values | 55 Distinct values | 55 Distinct values |
|  |  |  | | | |
| Hi Professor Kim, In Q24, I found th | 0 | Q24 information inconsistency Sc | 0 | q24 information inconsistency sorry | q24 inconsistency index q23 inf |
| A king gives a mathematician a cha | 1 | Silver Coin or Gold Coin Prize Let | 1 | silver coin gold coin prize let x1 num | gold bag coin coins silver prize |
| Fair coins tend to land on the same | 2 | Fair coins are not always fair I thi | 2 | fair coins always fair think fairness th | fair random coin generate coin: |
| Hi Professor Zhang, I reviewed the | 6 | HW3 Q5 ROSS book ex.2.31 Hi Ct | 4 | hw3 q5 ross book ex231 hi chloe sor | red balls ball black xi specific wl |
| Hi prof Zhang, I found the individ | 2 | Misalign in individual assignment | 2 | misalign individual assignment supp | misalign individual supplement |
| Hi Professor, is iPad allowed in our | 3 | iPad in open book exam As Jason | 3 | ipad open book exam jason explaine | device ipad electronic jason lap |
| Hi Professor Hao, I saw this post fr | 0 | clarification on the exam date reg | 0 | clarification exam date regarding ba | babs oct date 506 monday luck |
| Hi prof Zhang,I'm wondering if we | 0 | Jupyter notebook during the exar | 0 | jupyter notebook exam hi jules pleas | jupyter notebook exam won ha |
| Hi. I am a bit confused about this c | 1 | asking about in class quiz 10/3 - (| 1 | asking class quiz 103 q 4 question sa | independence necessary gener: |
| Hi Professor Zhang, I just realized t | 1 | Question Regarding Spreadsheet | 1 | question regarding spreadsheet soft | spreadsheet tomorrow's fine wp |
| Hi Professor Hao, Is VScode allowe | 0 | VScode Remember to disable Co- | 0 | vscode remember disable copilot wc | vscode internet use disable pro |
| Hi professor Zhang, During the fina | 0 | Question about misoperation dur | 0 | question misoperation exam hi prof | browser exam misoperation iph |
| Hi, I am curious about why changin | 1 | Question about linear programmi | 1 | question linear programming hi use | profit painting tables line feasit |
| Hi class, I understand some of you | 4 | Explanation of Shadow Price prac | 2 | explanation shadow price practice q | constraint price shadow negativ |
| Regarding below part, I am having | 6 | Help me understand negative sha | 2 | help understand negative shadow p | negative price shadow profit he |