Please go to the section ”**Environment setup**” for installing qtcreator and essential libraries required for this project.

Overview of implementation

The system overview is shown in fig .1. In the frontend user types the search title and presses the find button and gets the results in the form of URL. The search title input from the user is processed in the backend to get the close results and then these closed results are returned from backend to frontend to be shown to the user.

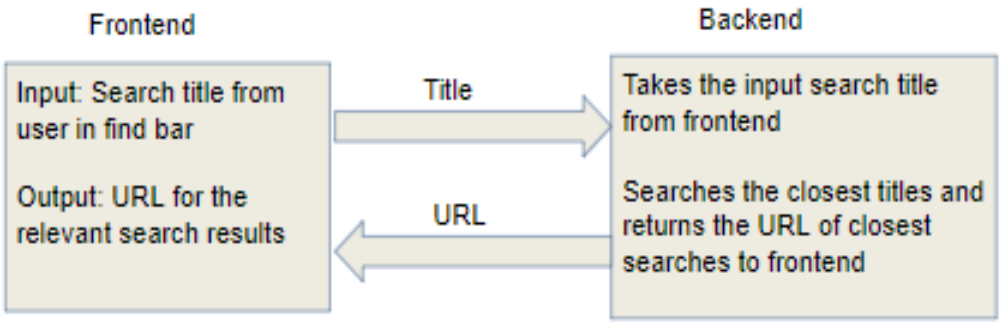


Fig.1: System overview

The searching algorithm in the backend uses a map where each entry in the map is a keyword mapped to the root of a binary search tree, the overview of the data structure is shown in fig. 2.

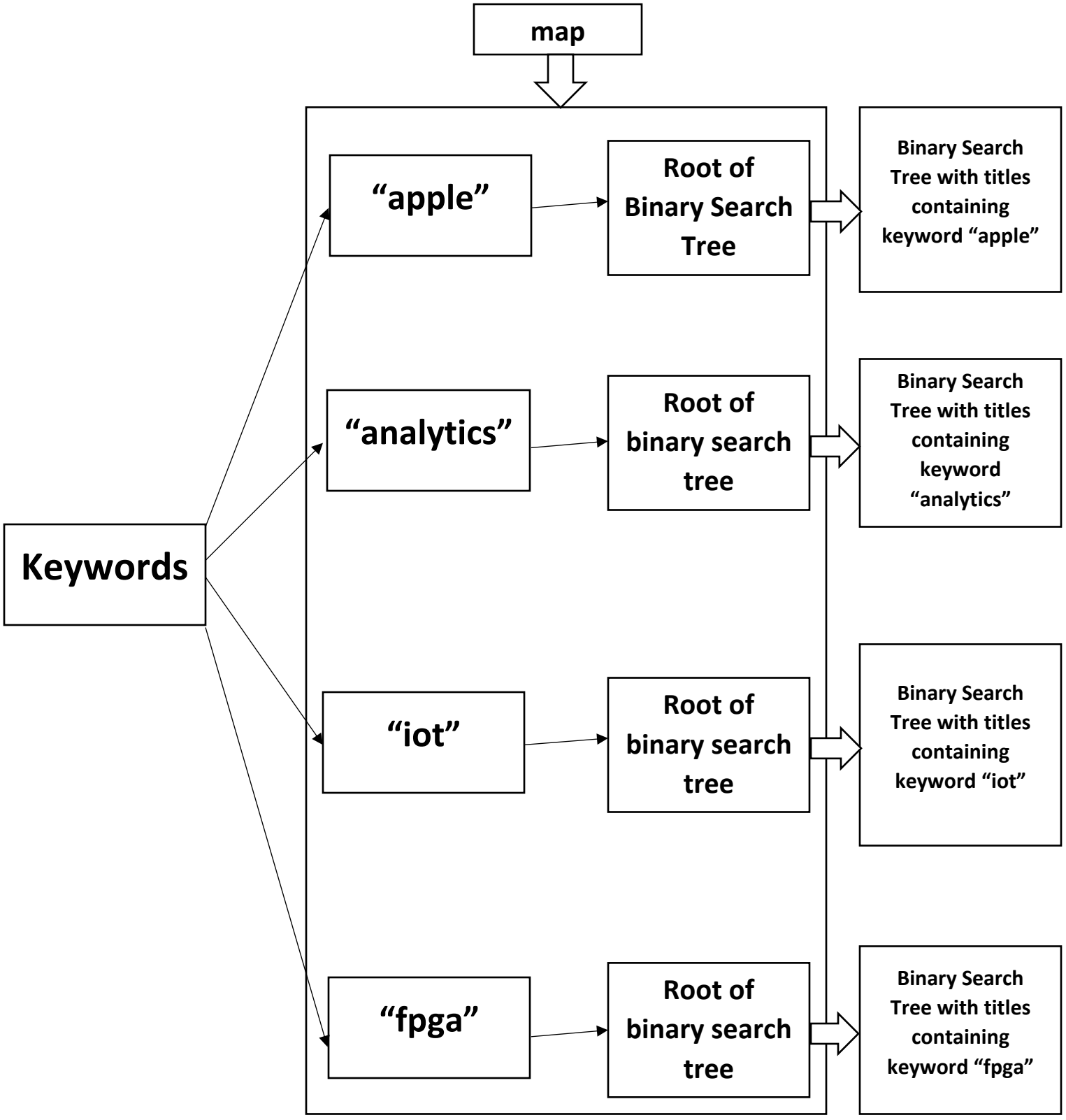


Fig.2: Overview of the data structure

The title to be searched is taken from the search bar and conveyed to the backend on the click of the find button. The dataset consists of pairs of entries where each entry: Title and URL. An example entry of the dataset is shown below:

Apple phytochemicals and their healthbenefits>https://link.springer.com/article/10.1186/1475-2891-3-5

Searching of titles in the backend is done by using a map of (keyword, the root of binary search tree) in two stages namely, keyword search and tree access.

First stage: Keyword is detected from the input search of user

Input search:

Enzymatic browning reactions in apple and apple products

Keyword match:

Some keywords have been selectively stored in the program, each keyword forms a group of titles that contain the keyword, the titles in that keyword group stored in the same binary search tree.

Second stage: After finding keyword in the title, access nodes of the tree for that keyword to search for the title.

Input search:

Enzymatic browning reactions in apple and apple products

Keyword match from stage 1

Tree access: map("apple", Root of BST for titles with "apple")

BST for "apple" stores titles containing the keyword "apple", one BST for all titles with the same keyword, similar BSTs formed to group all titles with the same keyword.

Link to the video

Please follow the link below for a demonstration on the working mechanism:

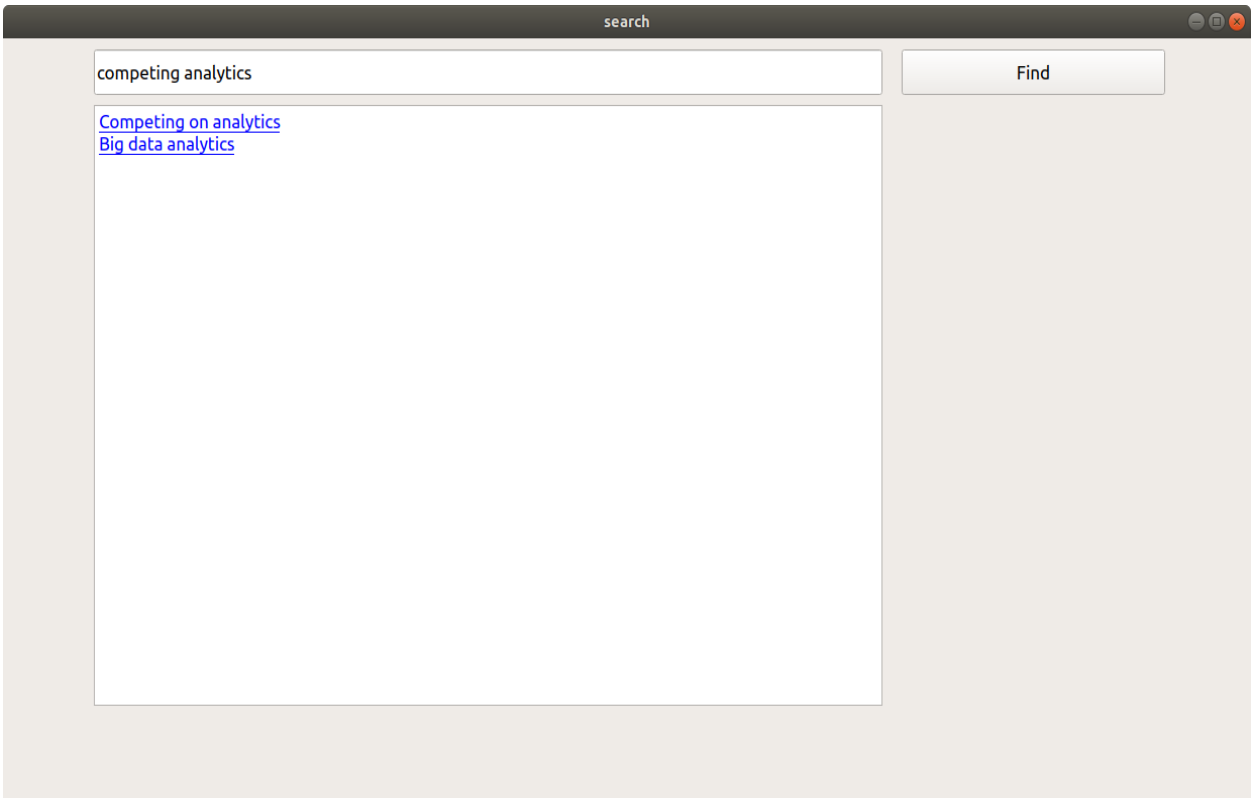
https://drive.google.com/open?id=1Uo7F7tYOvzvR2rNhliaYocJNr7lWBjb7

Link to presentation slides

https://drive.google.com/open?id=13bIBAWl7AU8YjSj4_F4oLSeW2YoJDWWYufaamMbe1gQ

Screenshots of the demo

This is a screenshot of the frontend Qt window in fig. 3, at the top is the search bar where a user enters the search title and clicks on the Find button in the right, then the results are displayed as URL in the bigger box below.



Fig, 3: Front window for search engine

The following page in fig. 4 appears when the user clicks on the second (from top) URL of the above search results.

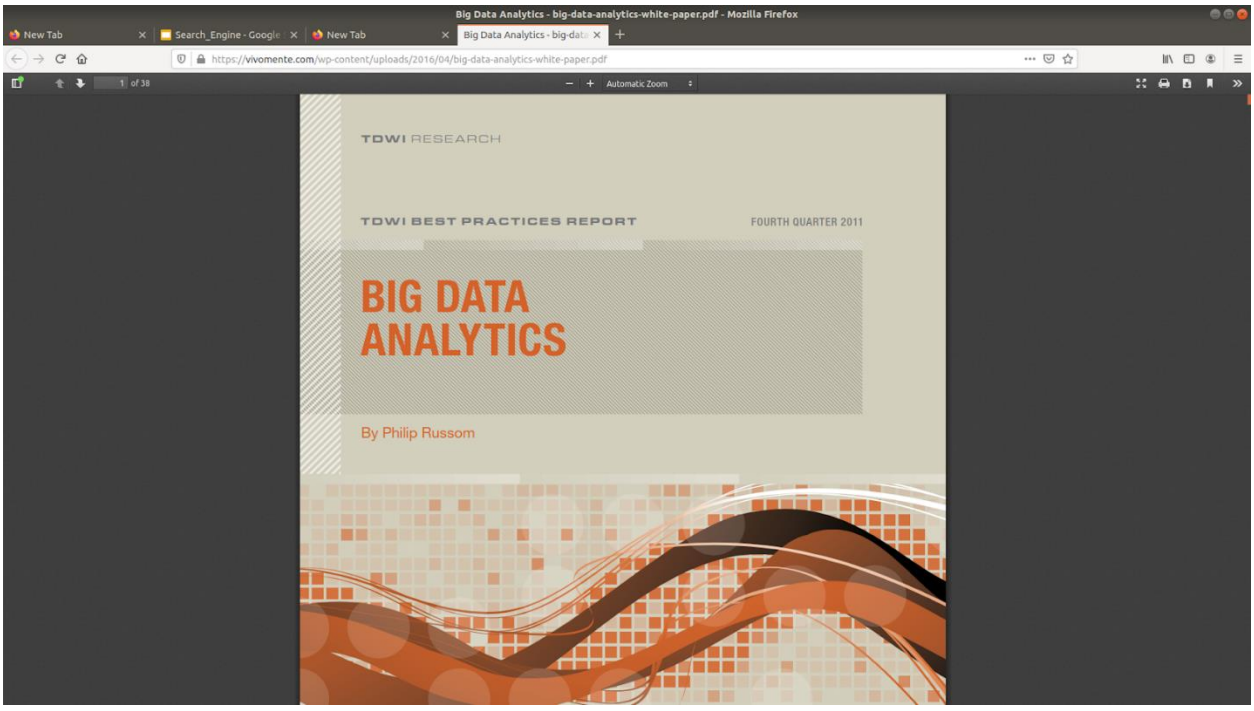


Fig. 4: This page opens after the user clicks on the link second from top

Future work

The following points are the possible extensions to the future scope of this project:

- The current system has been tested on a small dataset with a small number of keywords chosen, further with a larger dataset keyword selection can be made adaptive
- Future improvement in the search mechanism to show accurate results for partial title search with no restrictions in the order of typed words
- Predictions for full titles when the user is typing the title in the search bar and these predictions can be shown as autocomplete results
- Handling the spelling errors by showing close search title (with corrected spelling) result that might be the desired search from the user

Environment setup

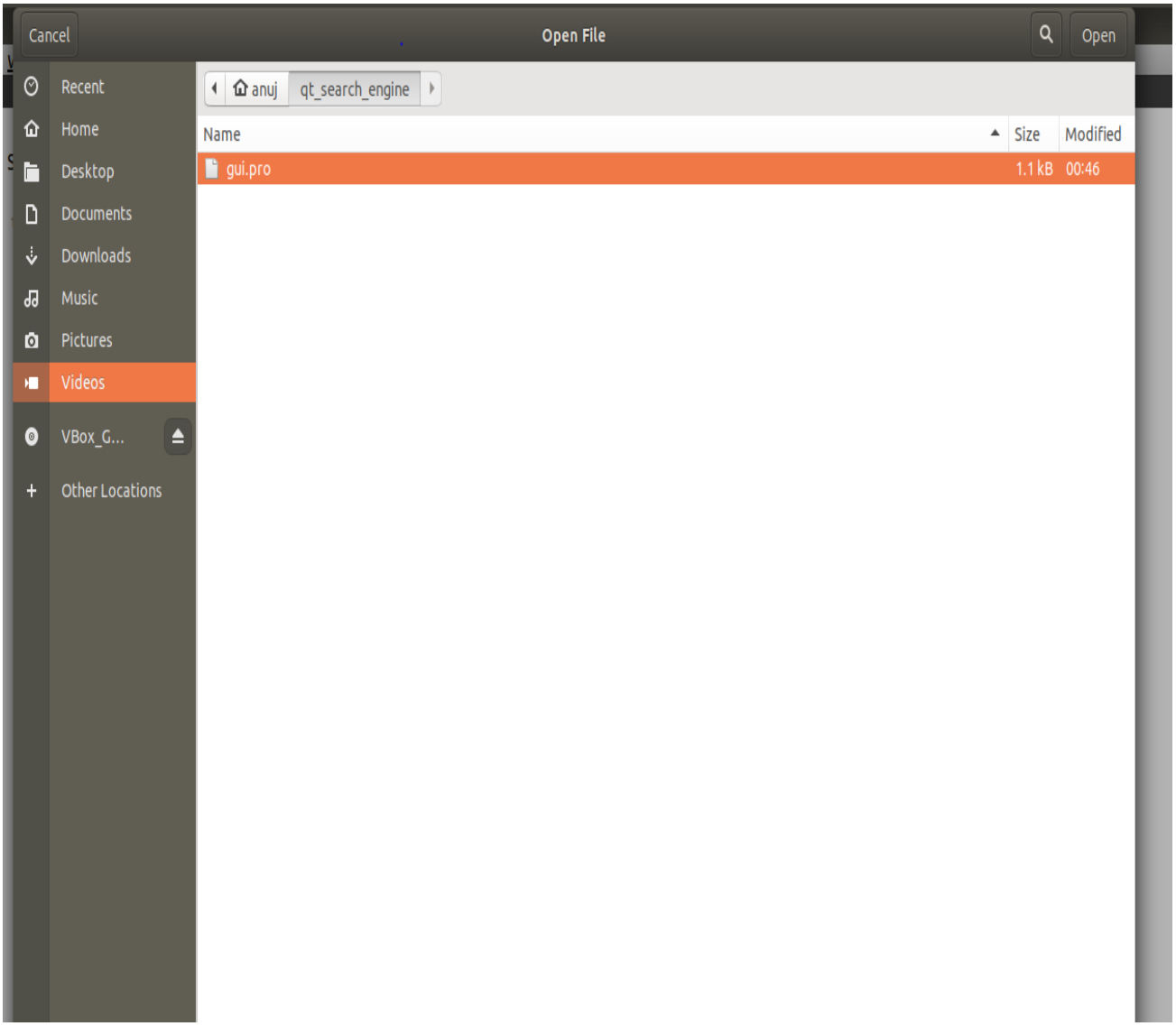
Please follow the below steps for installing qtcreator:

1. wget http://download.qt.io/official_releases/qt/5.14/5.14.2/qt-opensource-linux-x64-5.14.2.run
2. chmod +x qt-opensource-linux-x64-5.14.2.run
3. ./qt-opensource-linux-x64-5.14.2.run
4. Please follow the below video for instructions on installing qtcreator: https://youtu.be/I5jasWrsxT0
5. sudo apt-get install build-essential

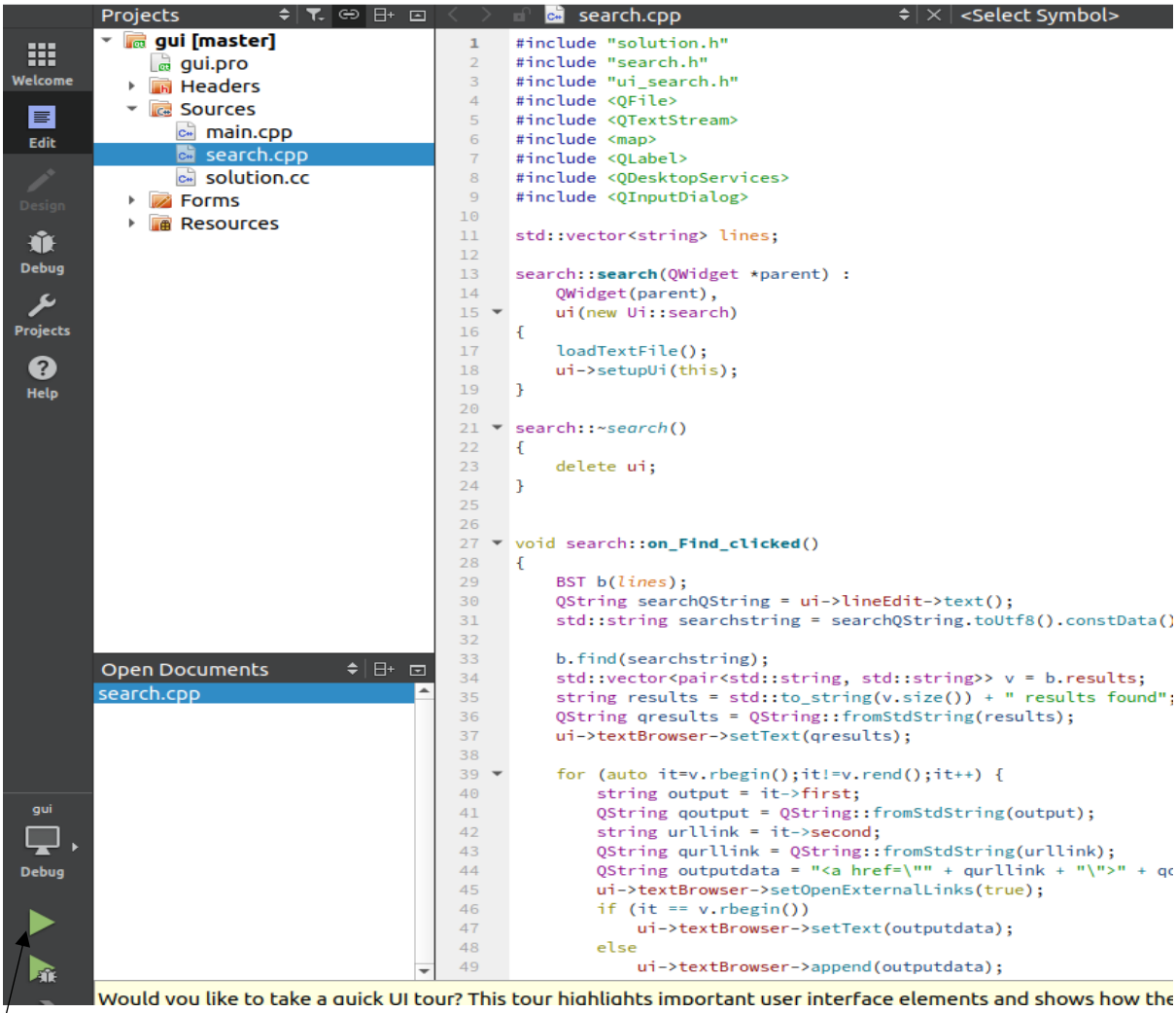
6. sudo apt-get install libfontconfig1
7. sudo apt-get install mesa-common-dev
8. sudo apt-get install libglu1-mesa-dev -y

Please follow the below steps for getting started with the project:

1. Go to File, then click on Open file or project.
2. Then open the gui.pro file from the cloned project.



3. Click on the Run button as shown below



Click this button

Sample example

Our search engine has 4 keywords:

1. apple
2. analytics
3. fpga
4. iot

Please use these keywords for searching publications.

If you want to search by the complete title name, please refer to "title_url.txt" file, which contains a map of title to the URL link.

For example, the following is a sample entry in the "title_url.txt" file:
Competing on analytics->
http://www.impactline.net/%C0%DA%B7%E1%C3%B7%BA%CE%B9%B0/OLAPDW/AnalyticsHBR.pdf
Where "Competing on analytics" is the title and
"http://www.impactline.net/%C0%DA%B7%E1%C3%B7%BA%CE%B9%B0/OLAPDW/AnalyticsHBR.pdf" is the URL link for the same.