International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 05 | May - 2024 SJIF Rating: 8.448 ISSN: 2582-3930

CREATION OF WEB BROWSER USING PyQt5

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Abstract: A web browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web. The information resource is identified by a Uniform Resource Identifier (URI) and may be a web page, image, video, or other piece of content. In these project our major goal is to create a web browser using only PYQt5. The PyQt5 is one of the GUI Toolkit of applications of python programming language. PyQt5 is cross-platform GUI toolkit. One can develop an interactive desktop application with so much ease because of the tools and simplicity provided by this library. A GUI application consists of Front-end and Back-end. PyQt5 has provided a tool called 'Qt Designer' to design the front-end by drag and drop method so that development can become faster and one can give more time on back-end stuff. It shows an sample browser like Google with some extra features like home , reload, back ,forward and moreover it is easy for creating a browser with PyQt5,by using this library the most useful thing for engineers to code reducibility..

1. INTRODUCTION:

A Web browser is a software application used to locate and display Web pages. These graphical browsers, which mean that they can display graphics as well as text. In addition, most modern browsers can present multimedia information, Including sound and video, though they require plug-ins for some formats. An information resource is identified by a Uniform Resource Identifier (URI) and maybe a web page, image, video, or other piece of content. Hyperlinks present in resources enable users to easily navigate their browsers to related resources .The primary purpose of a web browser is to bring information resources to the user. This process begins when the user inputs a Uniform Resource Identifier (URI), for example http://en.wikipedia.org/, into the browser. The Main aim is to create web browser using only PyQt5 module which makes simpler code to create a web browser as like Google chrome without using any scripting languages like java script, html, flask applications, java applets. This browser as some changes and it is also act personal browser.

1.1 DESCRIPTION

One of the method of accessing a particular page or content is achieved by entering its address, known as a Uniform Resource Identifier or URI The PyQt5 is one of the GUI Toolkit of applications of python programming language. One can develop an interactive desktop application with so much ease because of the tools and simplicity provided by this library. A GUI application consists of Front-end and Back-end. PyQt5 has provided a tool called 'Qt Designer' to design the front-end by drag and drop method so that development can become faster and one can give more time on back-end stuff. It shows an sample browser like Google with some extra features like home , reload, back ,forward and moreover it is easy for creating a browser with PyQt5,by using this library the most useful thing for engineers to code reducibility

1.2 PROBLEM STATEMENT

For many of the web browser uses frontend and backend languages normally by these for programmers require heavy of code which faces some difficulties to avoid these type of code difficulties using PyQt5 helps to reducibility and simplicity of code. The PyQt5 which is one of the GUI Toolkit of applications of python programming language. PyQt5 is cross-platform GUI toolkit. By using only PyQt5 module which makes simpler code to create a web browser. The main purpose of these project is to creating a web browser using PyQt5.Basically a web browser created using web technologies languages, scripting languages ,and flask applications etc. and require high amount of code from frontend developer, middleware developer and backend developer instead of this nowadays python provides all type of features and standard libraries like GUI toolkit which provides a GUI application consists of Front-end and Back-end. PyQt5 has provided a tool called 'Q t Designer' to design the front-end by drag and drop method so that development can become faster and one can give more time on back-end stuff.

1.3 SCOPE AND MOTIVATION

The intention of our project, This project has very good scope in real world. Where users can use easily interact with browser to clarify their doubts and issues while using the browser. The main motivation is to creating the web browser using only PYQt5 module which makes simpler code to create a web browser as like Google chrome without using any scripting languages like java script, html, flask applications, java applets. The main aim of this project is to create a web browser using only python programming which makes easier to create web browser.

1.4 OBJECTIVES

- The main objective of this project is to creating a web browser using only PyQt5 of python programming language of GUI toolkit.
- By using python language it makes easier to create browser.
- The main use of this project is making browser backend to simpler and gives frontend like google chrome to users. This browser backend simple by using PyQt5 module and it's add some additional features like home ,forward, reload, to the browser .This browser is available in multiple languages.

2. LITERATURE REVIEW

Here we will elaborate the aspects like the literature survey of the project and what all projects are existing and been actually used in the market which the makers of this project took the inspiration from and thus decided to go ahead with the project covering with the problem statement.

2.1 Literature Survey

- World Wide Web: Tim Berners-Lee wrote the first web browser on a NeXT computer, called World Wide Web, finishing the first version on Christmas day, 1990.
- Lib www: Berners-Lee and a student at CERN named Jean-Francois Groff ported the World Wide Web application from the NeXT environment to the more common C language in 1991 and 1992, calling the new browser lib www.
- Line-mode: Nicola Pellow, a math student interning at CERN, wrote a line-mode web browser that would work on any device, even a tele type.
- Viola WWW: Pei Wei, a student at the University of California at Berkeley, released the second browser for Unix, called Viola WWW, in May, 1992. Viola WWW had a range of advanced features, including the ability to display graphics and download applet
- Midas: During the summer of 1992, Tony Johnson at SLAC developed a third browser for Unix systems, called Midas, to help distribute information to colleagues about his physics research.6.
- Samba: Robert Cailliau started development of the first web browser for the Macintosh, called Samba.
- Arena : In 1993, Dave Raggett at Hewlett-Packard in Bristol, England , developed a browser called Arena, with powerful features for positioning tables and graphics.
- Opera : In 1994,the Opera browser was developed by a team of researchers at a telecommunication company called Telenor in Oslo, Norway.. Opera 2.1 was first made available on the Internet in the summer of 1996
- Mozilla: In October, 1994, Netscape released the first beta version of their browser, Mozilla 0.96b, over the Internet.
- Apple's Safari: It had its first beta release in January 2003; as of October 2009,.
- Google Chrome: It first released in September 2008. As of April 2010,it has a 7% usage share.

2.2 System Study:

2.2.1 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- ECONOMICAL FEASIBILITY
- TECHNICAL FEASIBILITY
- SOCIAL FEASIBILITY

2.2.2 ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The expenditures must be justified. The amount of fund that the company can pour into the research and development of the system is limited. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

2.2.3 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. This will lead to high demands on the available technical resources. Any system developed must not have a high demand on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

2.2.4 SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

2.3 EXISTING SYSTEM

2.2.1 Manual Summarization

In the existing system, web browsers are used for users to search information about reality, histories, entertainment, etc. world wide web through internet.The existing web browsers like google chrome ,Microsoft, Fire fox are based on many different types of software programming languages like java applets, flask applications ,scripting languages. This web browsers linked through URI (Uniform Resource identifier), URL. The web browsers are still today hot and trending website to all users and over the world.

Drawbacks:

Basically a web browser created using web technologies languages, scripting languages, and flask applications etc. and require high amount of code from frontend developer, middleware developer and backend developer to reduce the code or set of instructions use PyQt5 gives better code reducibility and simple and easy.

3. SYSTEM ANALYSIS

It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. System analysis is conducted for the purpose of studying a system or its parts in order to identify its objectives. It is a problem solving technique that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose. Analysis specifies what the system should do.

3.1 REQUIREMENTS ANALYSIS

In requirements analysis encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements. In this phase the requirements are gathered and analyzed. User's requirements are gathered in this phase. This phase is the main focus of the users and their interaction with the system.These general questions are answered during a requirement gathering phase. After requirement gathering these requirements are analyzed for their validity and possibility of incorporating the requirements in the system to be a

development is also studied. Finally, a Requirement Specification document is created which serves the purpose of guideline for the next phase of the model.

3.2 FUNCTIONAL REQUIREMENT

Requirement Analysis will cover the topics like the Functional, Non-Functional and the specific requirements of the project and touching all the software and the hardware requirements as well.

3.1.1 Software Requirements

The functional requirements or the overall description documents include the product perspective and features, operating system and operating environment, graphics requirements, design constraints and user documentation.The appropriation of requirements and implementation constraints gives the general overview of the project in regards to what the areas of strength and deficit are and how to tackle them.

- Python Idle 3.11.4 version (or)
- Anaconda 3.7 (or)
- Jupiter (or)
- Google Colab

3.1.2 Hardware Requirements

Minimum hardware requirements are very dependent on the particular software being developed by a given thought Python / Canopy / VS Code user. Applications that need to store large arrays/objects in memory will require more RAM, whereas applications that need to perform numerous calculations or tasks more quickly will require a faster processor.

- Operating system : windows
- Processor : minimum intel i3
- Ram : minimum 4 gb
- Hard disk : minimum 250gb

4. ARCHITECTURE

The architecture represents a web browser is a software application for retrieving, presenting and traversing information resources on the World Wide Web. The main aim of this project is to creating a web browser using only PyQt5 of python programming language of GUI toolkit. By using python language it makes easier to create browser. The main use of this project is making browser backend to simpler and gives frontend like google chrome to users. This browser backend simple by using PyQt5 module and it's add some additional features like home ,forward, reload, to the browser .

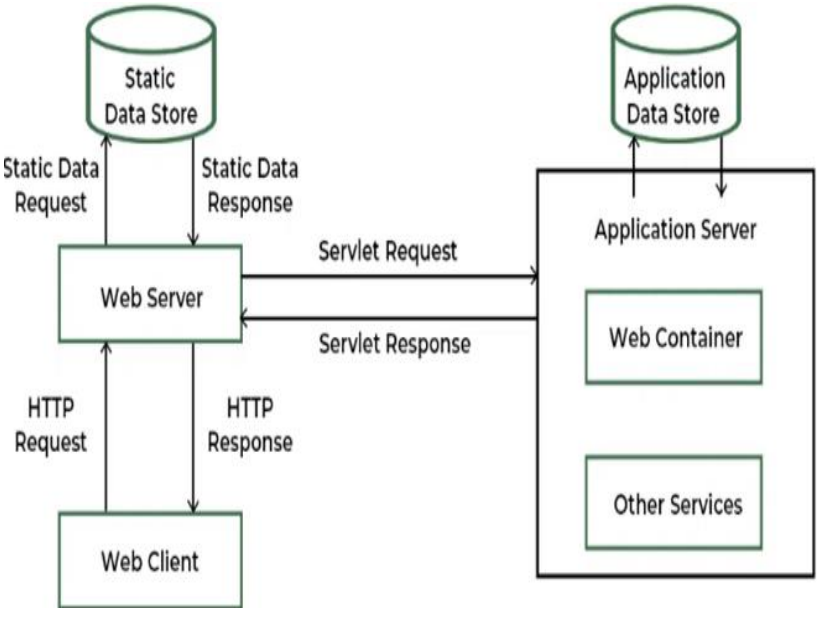


Fig4: Architecture

4.1 MODULES:

4.4.1 PyQt5:
PyQt5 which is the cross platform toolkit of GUI. By using this Qt – design tool it creates the web pages and design more platforms for creating an Interactive desktops. A GUI application consists of Front-end and Back-end. PyQt5 has provided a tool called 'Qt Designer' to design the front-end by drag and drop method so that development can become faster and one can give more time on back-end stuff.

4.4.2 QtCore:
PyQt API is a large collection of classes and methods. While QtCore module contains non-GUI functionality for working with file and directory etc., the Core non-GUI classes used by other modules.

4.4.3 QtWidgets:
PyQt5 combines with a huge number of widgets built-in, from simple text boxes to digital displays, vector graphics canvas and a full-blown web browser. QtWidgets are mainly used for Classes for creating classic desktop-style UIs.

4.4.4 Qt GUI:
Qt Gui module consist of all the graphical controls. A QtGui consists of a Graphical user interface components which are used for creation of graphical user interface.

4.4.5 QtWebEngineWidgets:
PyQt Web Engine is a set of Python bindings for the Qt Company's Qt Web Engine framework. This framework provides the ability to embed web content in applications and is based on the Chrome browser.

4.4.6 QtPrintSupport:
Qt Print Support provides a extensive cross-platform support for printing. Using this printing systems on each platform, Qt applications can print to attached printers and across the networks to remote printers.

5. SYSTEM REQUIREMENT SPECIFICATION

5.1 Software Requirements

Operating System: The software should be compatible with commonly used os such as windows, Linux and Mac.

Python: The code is written in Python programming language, so Python runtime environment needs to be installed on the system. Python version 3.7 or later is recommended.

Python Libraries: Install the required Python libraries using pip or conda package managers.:

- PyQt5
- QtCore
- QtWidgets
- QtGUI
- QtWebEngineWidgets
- QtPrintSupport

Development Environment: A code editor or integrated development environment (IDE) such as Visual Studio Code, PyCharm, or Jupyter Notebook can be used for writing and running the code.

5.2 Hardware Requirements

Processor (CPU): A multi-core processor with decent processing power is recommended for handling text processing tasks efficiently.
Memory (RAM): At least 4GB of RAM is recommended for smooth execution, especially when working with large datasets or running Complex summarization.
Storage: Sufficient disk space to store the application code, libraries, and any generated data. This requirement can vary depending on the size of the dataset and the models used.

6. Class Diagram:

Class diagrams are the main building blocks of every object oriented methods. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application. Class diagram describes the attributes and operations of a class and also the constraints imposed on the system.Class diagram shows a collection of classes, interfaces, associations, collaborations, and constraints. It is also known as a structural diagram.

- **Purpose**: To describe the structure of the software system, the purpose of class diagram is to model the static view of an application.
- **Components**: Classes, attributes, methods, associations, and inheritance relationships.
- **Usage**: Class diagrams provide an overview of the system's object-oriented design, representing entities like users, chat data, analysis components, and more.

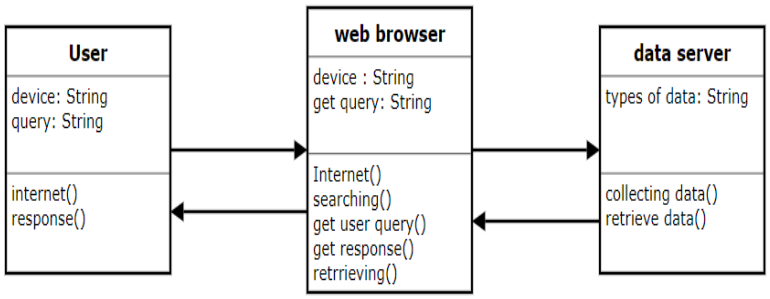


Fig6: ER diagram

7. Activity Diagram

Activity Diagram is a process flows in the system are captured in the activity diagram. Similar to a state diagram, an activity diagram also consists of activities, actions, transitions, initial and final states, and guard conditions

Purpose: Flowcharts are designed to visualize the step-by-step sequence of actions or operations within the software system. They provide a clear and easy-to-understand way of representing the logic and flow of the application's functionalities.

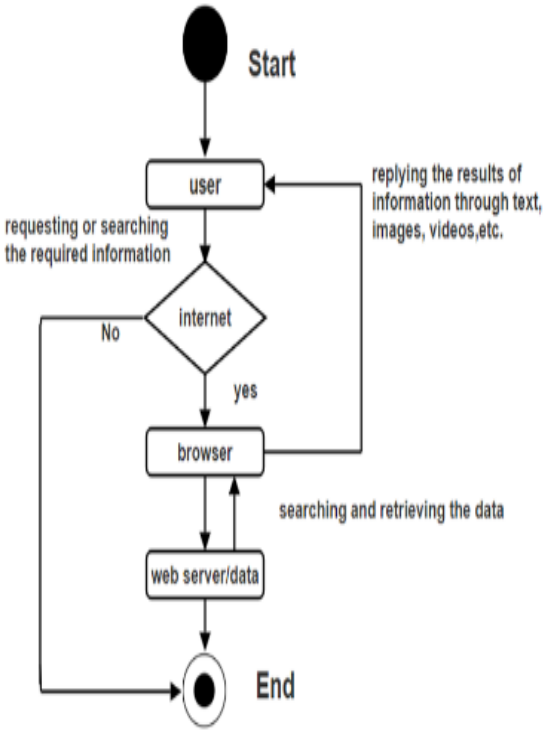
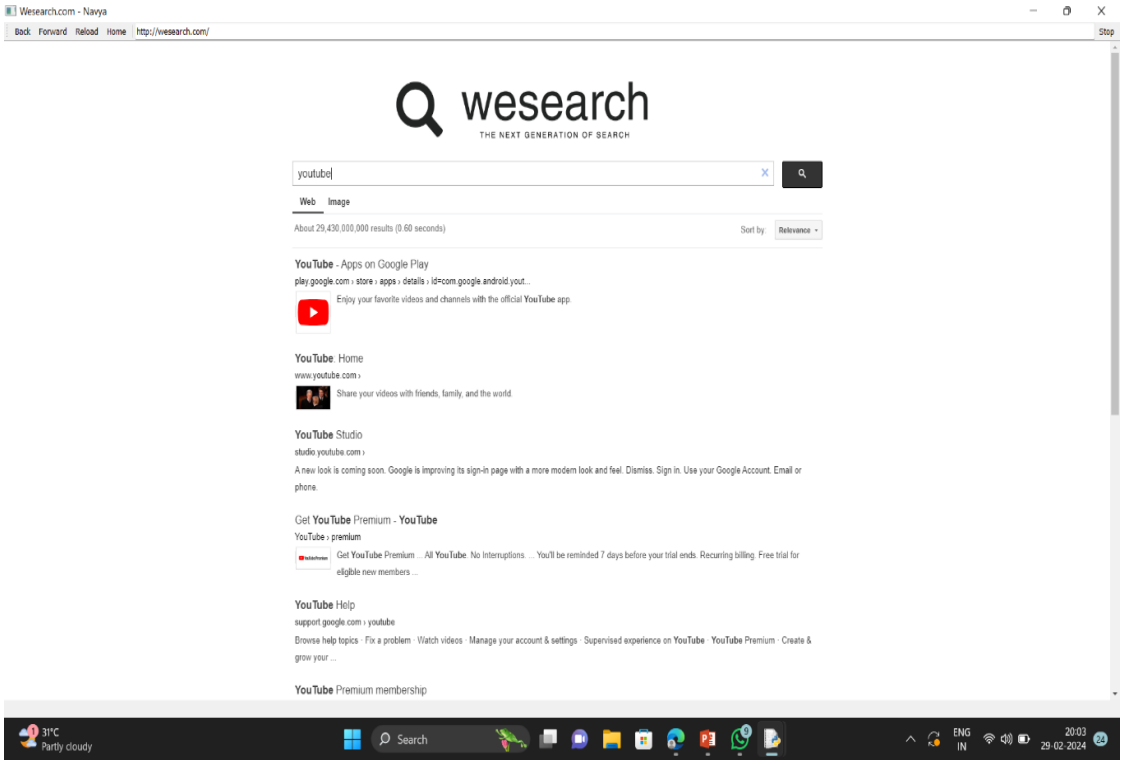


Fig 7: Activity Diagram

8. OUTPUT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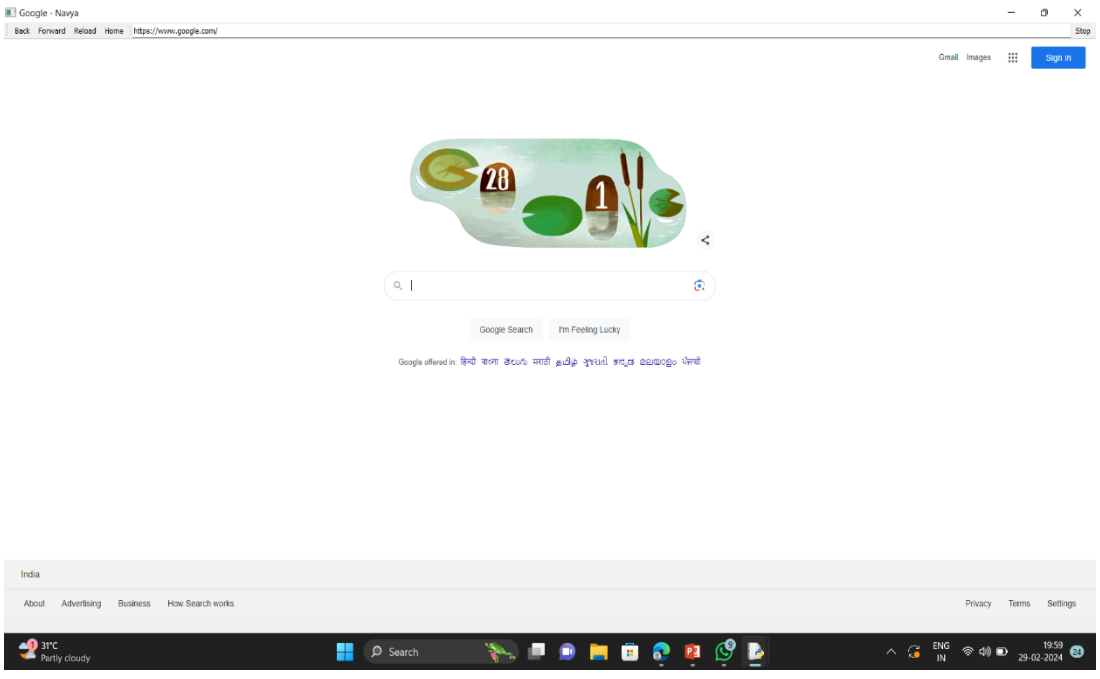
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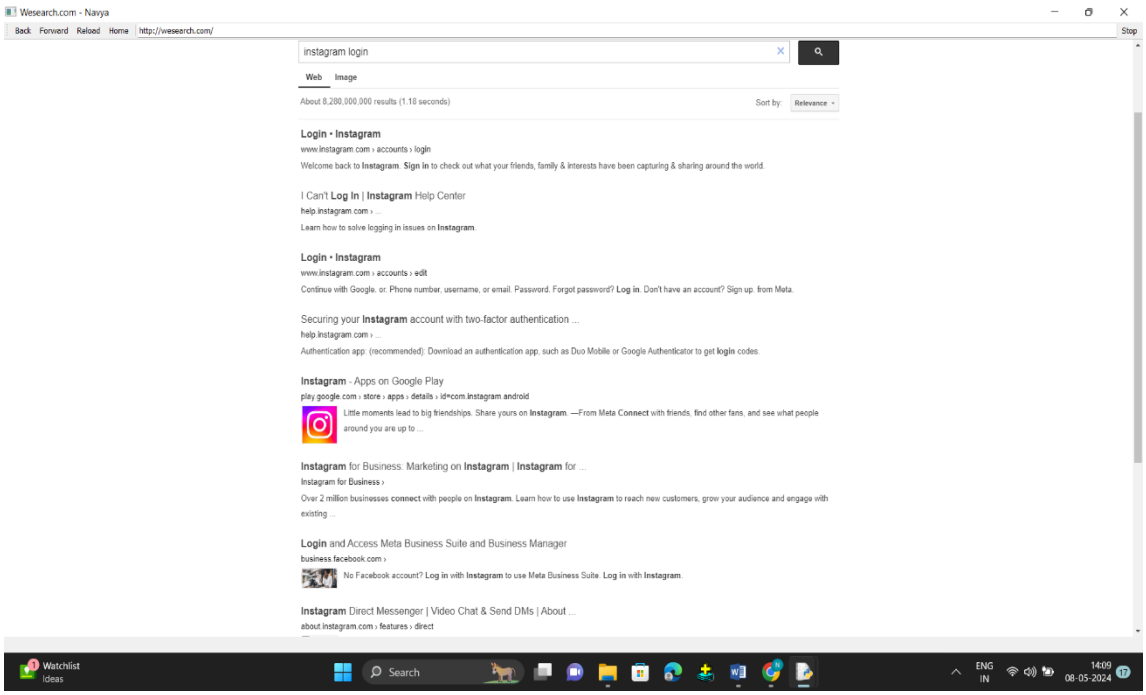
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Welcome back to Instagram. Sign in to check out what your friends, family & interests have been capturing & sharing around the world.
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Authentication app: (recommended): Download an authentication app, such as Duo Mobile or Google Authenticator to get login codes.
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Little moments lead to big friendships. Share yours on Instagram. —From Meta Connect with friends, find other fans, and see what people around you are up to ...
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Over 2 million businesses connect with people on Instagram. Learn how to use Instagram to reach new customers, grow your audience and engage with existing ...
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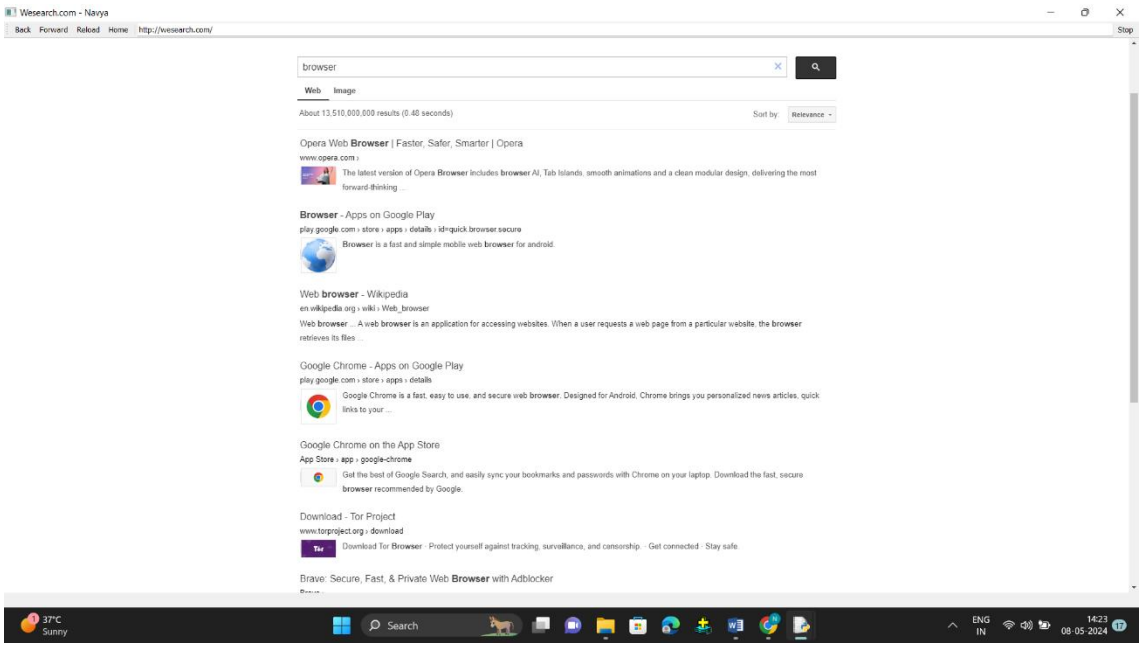
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Web browser ... A web browser is an application for accessing websites. When a user requests a web page from a particular website, the browser retrieves its files ...
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CONCLUSION

In conclusion, the aim of this project is to create a web browser using PyQt5 which is the cross platform toolkit of GUI. By using this Qt – design tool it creates the web pages and design more platforms for creating an Interactive desktops. This web browser provides a privacy protections and blocks the website which are harmful for system and users privacy data. With the help PyQt5 we can reduce the code for any type of building browsers or web pages or platforms and it is easy to use and simple. Hyperlinks present in resources enable users to easily navigate their browsers to related resources .The primary purpose of a web browser is to bring information resources to the user. This process begins when the user inputs a Uniform Resource Identifier (URI), for example http://en.wikipedia.org/, into the browser.

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