TARANTULA

AN ELEGANT SEARCH ENGINE

INTRODUCTION

01

Simple web search engine for indexing & searching HTML pages.

02

We have used Python for development. Python is well known for its simple syntax and strong support for main operating systems.

03

Tarantula lets users search for their query from a large set of documents and the results are displayed according to their ranks. Tarantula uses PageRank Algorithm.

04

Algorithms for full-text searches are among the most important collective intelligence algorithms.

05

It is widely believed that Google's rapid rise from an academic project to the world's most popular search engine was based largely on the Page Rank algorithm.

PROPOSED SYSTEM

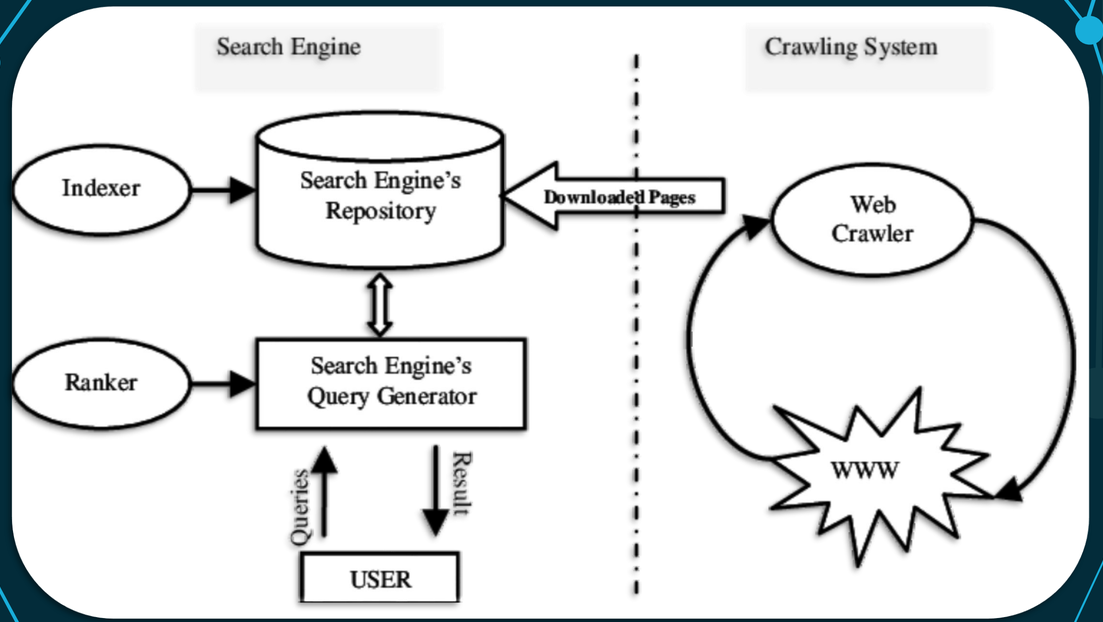
We propose to build a web application for a search engine. This includes PC as well as mobile devices.

Extracted data is stored in the database and then pre-processed and indexed.

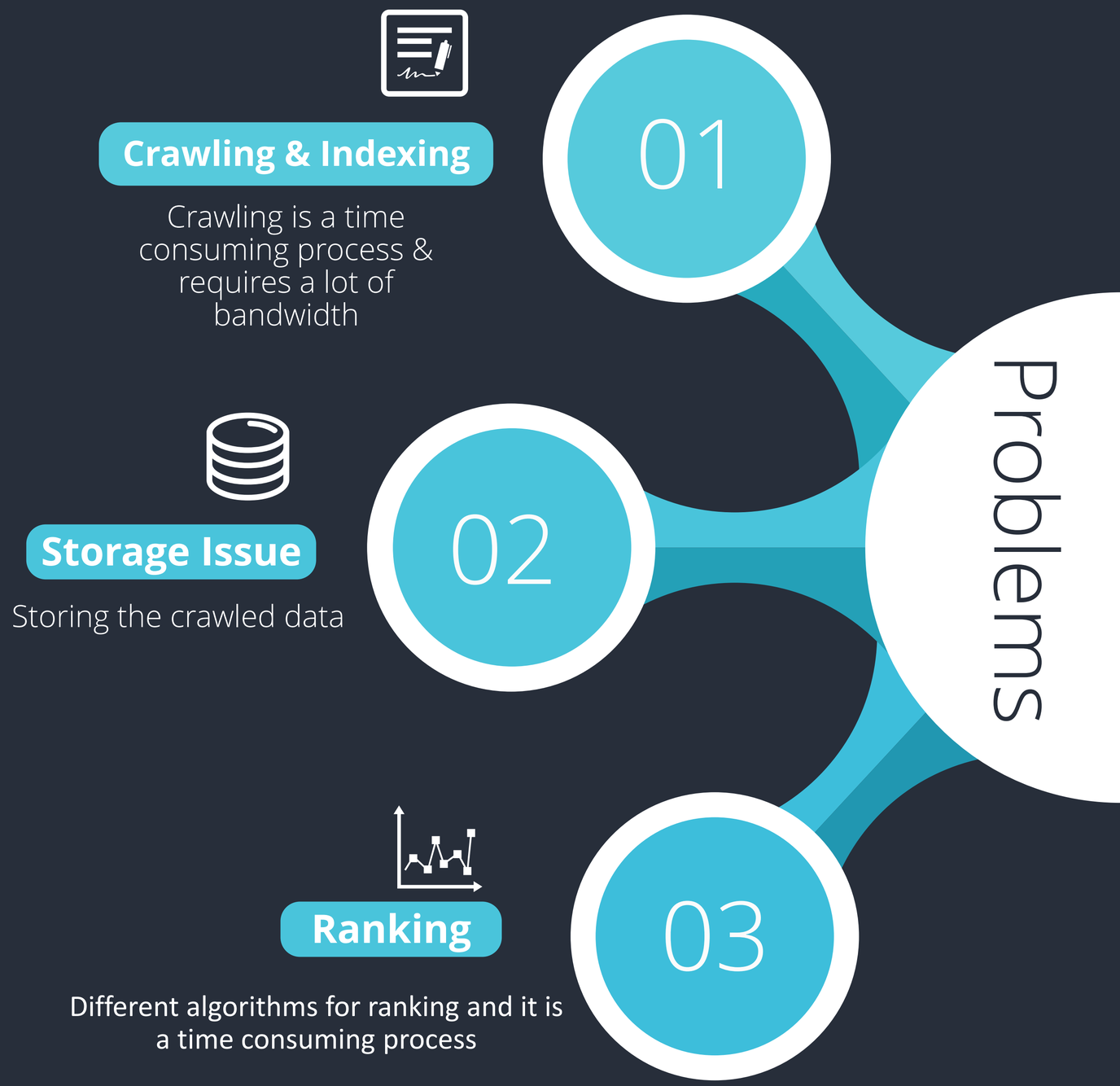
First we will build our custom Web Crawler which will crawl the WWW recursively in a DFS manner.

Pages are assigned scores using metrics like location score, frequency score, inbound link score, distance score, & PageRank score.

BLOCK DIAGRAM



PROBLEMS FACED



SOLUTION TO PROBLEMS

Solution

01

Crawling & Indexing

Parallel Crawling and threading can be used

02

Storage Issue

Faster Disk read write disk is required to stored crawled data

03

Ranking

Ranking Can be improved by Increasing the number of iterations

IMPLEMENTATION

FRONT-END

CSS

AJAX

HTML

JavaScript

BACK-END

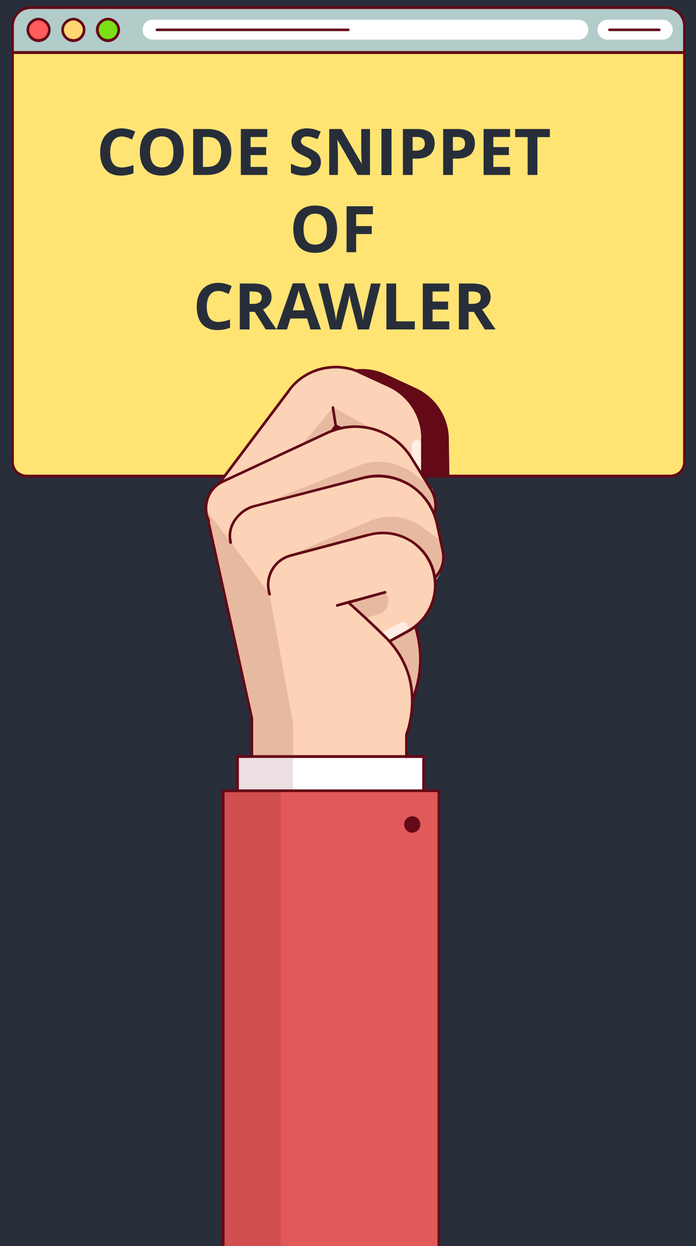
Python

BeautifulSoup

Flask

Selenium
WebDriver

SQLite




```
def crawl(self,pages,depth=1):
        options = webdriver.ChromeOptions()
        options.add_experimental_option("prefs", prefs)
        driver = webdriver.Chrome(options=options)
        driver.set_page_load_timeout(75)
        driver.implicitly_wait(75)
        for i in range(depth):
            newpages = set()
            for page in pages:
                try:
                    driver.get(page)
                    c = driver.page_source
                except:
                    print("Couldn't open page : {}".format(page))
                    driver.close()
                    driver = webdriver.Chrome(options=options)
                    driver.set_page_load_timeout(75)
                    driver.implicitly_wait(75)
                    continue
                soup = BeautifulSoup(c,'html.parser')
                for script in soup(["script", "style"]):
                    script.decompose()
                self.addToIndex(page,soup)
                links = soup('a')
                for link in links:
                    if ('href' in dict(link.attrs)):
                        url = urljoin(page,link['href'])
```


```
        if url.find("'")!=-1 or url[0:11] == 'javascript' or url[0:3] == 'tel'
            continue

        url = url.split('#')[0]
        url = url.split('%')[0]


        if url[0:4] == 'http' and not self.isIndexed(url):
            newpages.add(url)
            pages_file = open('pages','wb')
            newpages_file = open('newpages','wb')
            pickle.dump(newpages, newpages_file)
            pickle.dump(pages, pages_file)
            newpages_file.close()
            pages_file.close()
        linkText=self.getTextOnly(link)
        self.addLinkRef(page,url,linkText)
images = soup('img')
for image in images:
    alt = ''
    src = ''
    title = ''
    if ('src' in dict(image.attrs)):
        imageUrl=urljoin(page,image['src'])
        imageUrl=imageUrl.split('?')[0]
        imageUrl=imageUrl.strip()
        if imageUrl[0:5] == 'data:':
            continue
```


```
                if ('alt' in dict(image.attrs)):
                    alt=image['alt']
                    alt = alt.replace("'", ' ')
                    alt = alt.replace('"', " ")
                    alt = alt.strip()
                if ('title' in dict(image.attrs)):
                    title=image['title']
                    title = title.replace("'", ' ')
                    title = title.replace('"', " ")
                    title = title.strip()
                # print(f'Image- {imageUrl}')
                urlid = self.getEntryId('urllist','url',page)
                insertImageQuery = f"INSERT INTO images(siteurlid, imageurl, alt, title) VALUES ('{urlid}','{imageUrl}','{alt}','{title}')"
                # print(insertImageQuery)
                self.con.execute(insertImageQuery)
        self.dbcommit()
    pages=newpages
driver.close()
```


```python
def calculatePageRank(self,iterations=100):
    # clear out the current PageRank tables
    self.con.execute('DROP TABLE IF EXISTS pagerank')
    self.con.execute('CREATE TABLE pagerank(urlid PRIMARY KEY,score)')

    # initialize every url with a PageRank of 1
    self.con.execute('INSERT INTO pagerank SELECT rowid, 1.0 FROM urllist')
    self.dbcommit()

    for i in range(iterations):
        print ("Iteration %d" % (i))
        for (urlid,) in self.con.execute('SELECT rowid FROM urllist'):
            pr=0.15
            # Loop through all the pages that link to this one
            for (linker,) in self.con.execute(f'SELECT DISTINCT fromid FROM link WHERE toid={urlid}'):
                # Get the PageRank of the linker
                linkingpr = self.con.execute(f'SELECT score FROM pagerank where urlid={linker}').fetchone()[0]
                # Get the total number of links from the linker
                linkingcount = self.con.execute(f'SELECT COUNT(*) FROM link WHERE fromid = {linker}').fetchone()[0]
                pr += 0.85*(linkingpr/linkingcount)
            self.con.execute(f'UPDATE pagerank SET score = {pr} WHERE urlid = {urlid}')
    self.dbcommit()
```

APPLICATIONS / FEATURES

Web Search

This feature provides websites and URLs as search results.

Image Search

This feature populates all images based on the user query the results are displayed according to descending order of clicks

Torrent Search

This search enables the user to search all popular and trending torrents .The torrents are displayed according to seeders and leechers count.

Voice Typing

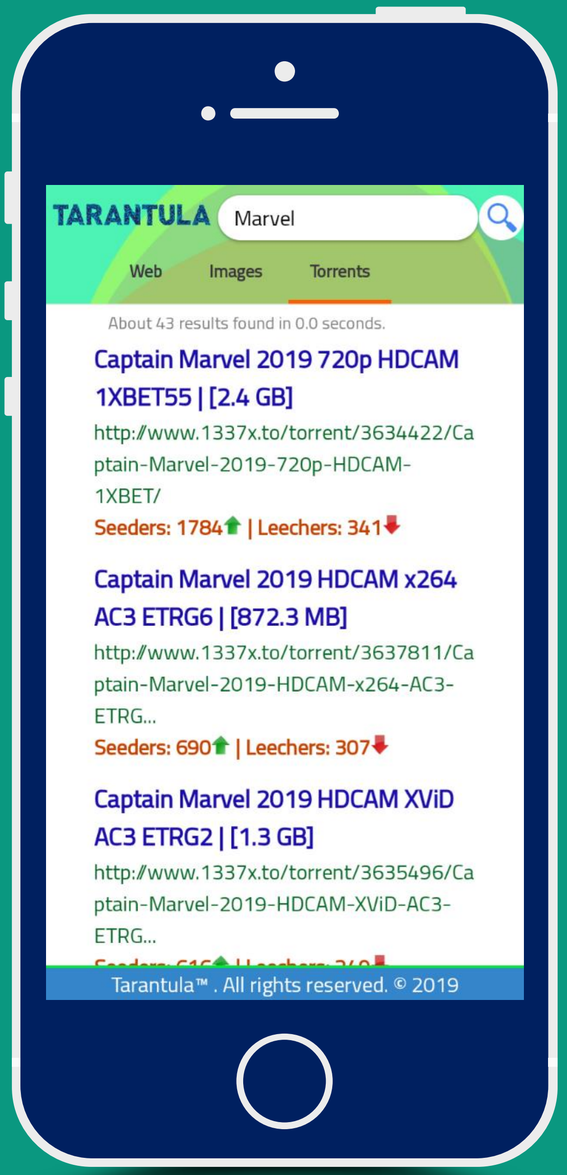
This feature helps user to input search query by his speech

I’m Feeling Lucky

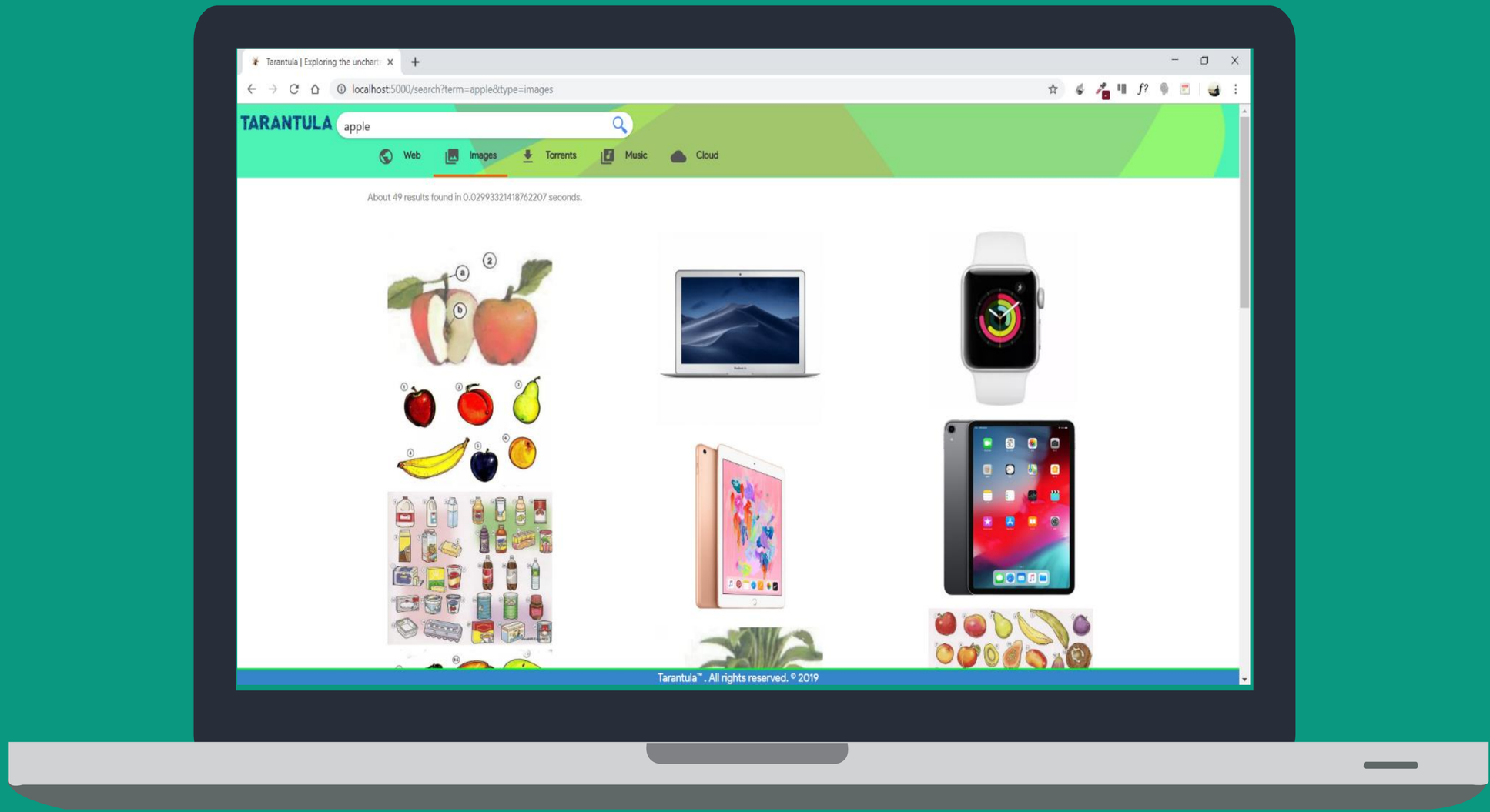
This feature redirects the user to website having the highest rank.

RESULTS

MOBILE VIEW



LAPTOP VIEW



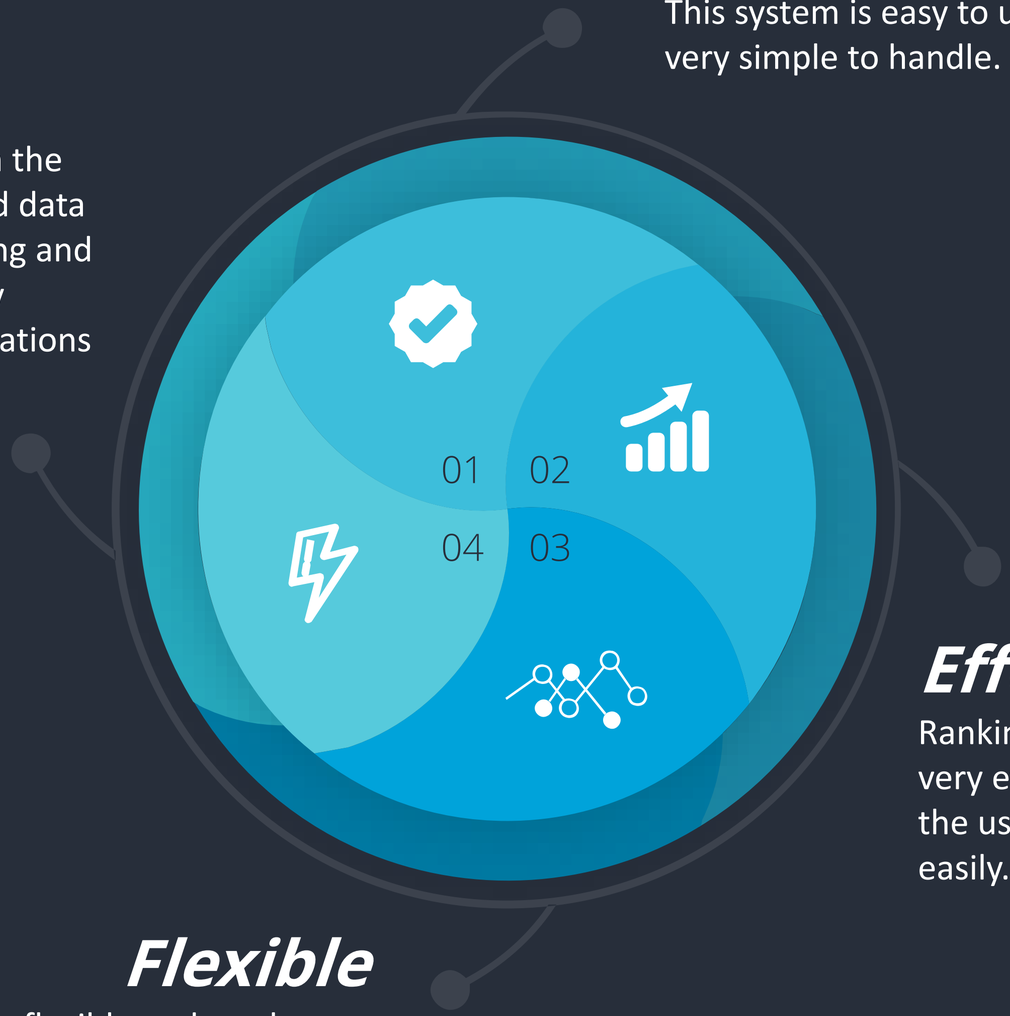
ADVANTAGES

Convenient

This system is easy to use and is very simple to handle.

Dynamic

As it processes data based on the crawled data and this crawled data is provided as input for ranking and accuracy can be improved by increasing the number of iterations in Page Rank Algorithm.



Effective

Ranking and Indexing is very effective as it helps the user to search query easily.

Flexible

It is quite flexible and can be run on any system.

FUTURE SCOPE

- Semantic Search
- Crawler Intelligence