GCRAWLER: GRAPHICAL WEB CRAWLER

The GCrawler project is a graphical web crawler which crawls a user-supplied website, following links on each page as it goes. It displays a color-coded graph of what pages were crawled and how it reached each page. Try it out here: GCrawler App

Website

The Website is responsible for:

1. Serving the user with the search form
2. Tracking the user's recent searches
3. Passing input to the Data Transfer program
4. Displaying the results of a search

```
router.post('/', function(req, res){

    r = {};
    var today = new Date();
    var dd = String(today.getDate()).padStart(2, '0');
    var mm = String(today.getMonth() + 1).padStart(2, '0');
    var yyyy = today.getFullYear();
    today = mm + '/' + dd + '/' + yyyy;

    var link = req.body.link;
    var search_type = req.body.search_type;
    var max = req.body.max;
    var keyword = req.body.keyword;

    if(!link || !search_type || !max)
    {
        r.error = "Invalid search...please try again!";
        r.jsscripts = ["static_search.js"];
        r.styles = ["search.css"];
        res.render('search', r);
        return;
    }
```

```
"""
Function Name: main
Description: The main controlling program of the crawler.
Inputs: takes a string representing the starting URL, a char flag for type of
    search, an integer representing the link limit and an optional keyword for
    halting the search
Outputs: Tree in JSON format
"""
def main(url, search_type, link_limit, keyword = None):
    #branch based on DFS or BFS (Use different functions for each, general flow below)
    if search_type == "dfs":
        tree, robots_flag = cu.depth_search(url, link_limit, keyword)
    elif search_type == "bfs":
        tree, robots_flag = cu.breadth_search(url, link_limit, keyword)
    #bad parameter
    else:
        return 1
    #log the resulting output
    string_list = []
    for node in tree:
        string_list.append(node.__str__())

    #check robots flag
    if robots_flag:
        print("robots", end = "")

    print('[' + ','.join(string_list) + ']')
    return 0
```

Data Transfer

The Data Transfer program is responsible for:

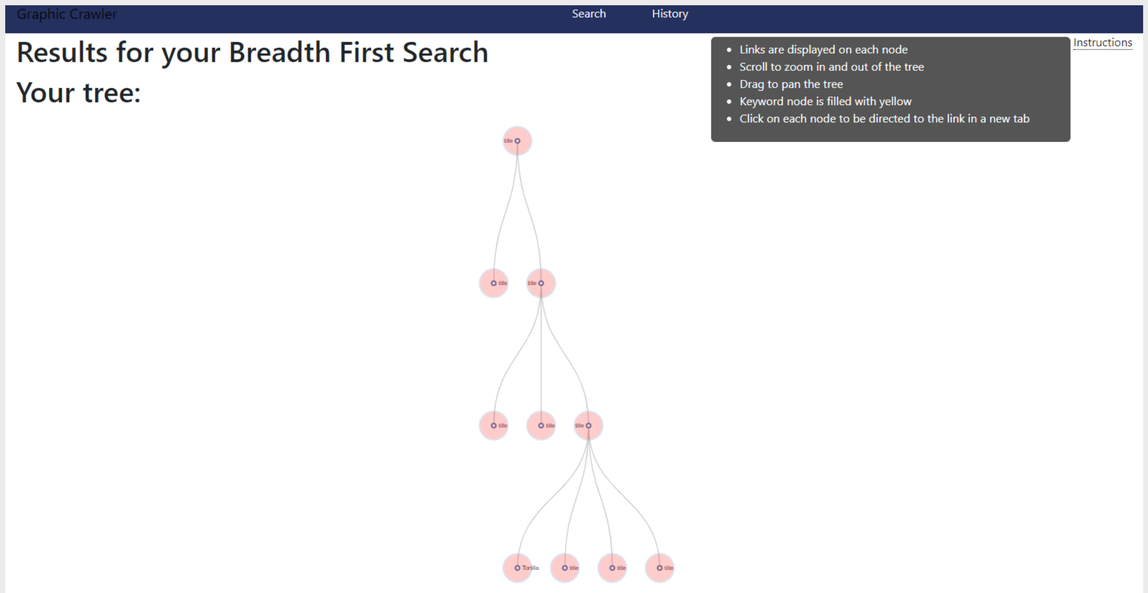
1. Receiving input from the Website
2. Passing the input to the Crawler
3. Receiving the output from the Crawler
4. Passing the output to the Website for rendering

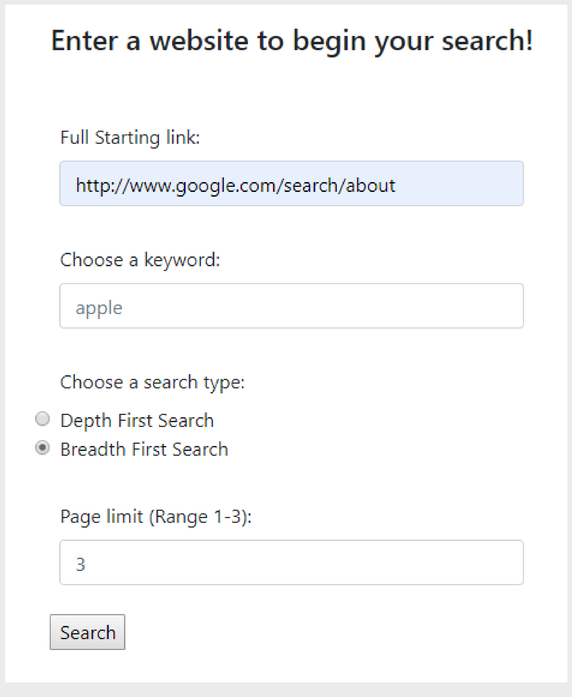
```
class Node {
    constructor(link) {
        this.name = link;
        this.children = [];
        this.parent = "";
    }
}


function makeLinkTree(jsonArray) {
    let dict = {};
    let root;

    jsonArray.forEach(function (urlObject) {
        let newNode;
        if (urlObject.URL in dict) {
            newNode = dict[urlObject.URL];
        }
        else {
            newNode = new Node(urlObject.URL);
            newNode.title = urlObject.Title;
            newNode.KeywordFound = urlObject.KeywordFound;
            dict[urlObject.URL] = newNode;
        }
        if (urlObject.Parent === 'null') {
            root = newNode;
        }
        else {
            let parentNode;
            if (!(urlObject.Parent in dict)) {
                parentNode = new Node(urlObject.Parent);
                dict[urlObject.Parent] = parentNode;
            }
            else {
                parentNode = dict[urlObject.Parent];
            }

            parentNode.children.push(newNode);

        }
```

Crawler

The Crawler is responsible for:

1. Receiving input from the Data Transfer program
2. Crawling each page from the starting link
3. Passing the formatted results to the Data Transfer program for further processing





GCRAWLER FEATURES:

- **Intuitive:** Complete a simple form to crawl any website. Supply a keyword to search for text on each page. GCrawler will halt when it finds the keyword. (*left*).
- **Retentive:** GCrawler stores your sessions' past searches on the History tab for easy re-use.
- **Flexible:** Choose from Depth First Search or Breadth First Search methods. Depth First Search will follow a random link on each page until the specified page limit (1-10) is reached. Breadth First Search will follow all links on each page until the specified depth limit (1-3) is reached. (*left*)
- **Informative:** GCrawler's color-coded results display the title of each page on the node. The URL can be seen by hovering over the node. A user can click the node to open the page. (*above*)
- **Good Bot:** GCrawler adheres to the Robot Exclusion Protocol by reading a page's robots.txt file and abiding by its rules. It also evaluates pages and links for other indicators that it should not crawl the page or follow the links.

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CONNECT WITH THE GCRAWLERS:

Christopher Beall (Data Transfer): https://github.com/beallch

Helen Jiang (UI/Website): https://github.com/hyjiang7

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