

Dec 09, 20 1:02

CLI.java

Page 1/6

```

/**
 * This is my code! ItâM-^@M-^Ys goal is to search through documents and return
 * which
 * documents contained the word given
 * CS 312 - Assignment 9
 * @George Haff
 */

import java.util.HashMap;
import java.util.HashSet;
import java.util.ArrayList;
import java.util.Scanner;
import java.util.Collections;
import java.io.File;
import java.io.IOException;

// Creates a list of words not to be seen by the search engine
class Stoplist {

    protected ArrayList<String> stoplist;

    /*
     * purpose: Creates the stoplist from the file
     * input: String filename
     * result: updates the stoplist
     */
    Stoplist(String filename) throws IOException
    {
        stoplist = new ArrayList<>();
        File f = new File(filename);
        Scanner file = new Scanner(f);

        try {
            while (file.hasNextLine())
            {
                file.useDelimiter("[^a-zA-Z]+");
                stoplist.add(file.nextLine().toLowerCase());
            }
            file.close();
        } catch (Exception e)
        {
            e.printStackTrace();
        }

        /*
         * purpose: Retrieves the stoplist
         * result: returns the stoplist as a list
         */
        public ArrayList<String> getStoplist()
        {
            return stoplist;
        }
    }

    // Contains all of the documents and stores which words have been in
    // which documents
    class InvertedIndex {

        protected HashSet<String> containIn;
        protected HashMap<String, HashSet<String>> docIndex;
        protected Stoplist stoplist;
        protected ArrayList<Document> documents;

        /*
         * purpose: Initializes all of the lists and hashes
         * input: String filename

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Dec 09, 20 1:02

CLI.java

Page 2/6

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        * result: updates of the all lists and hashes
        */
        InvertedIndex(String filename) throws IOException
        {
            docIndex = new HashMap<>();
            stoplist = new Stoplist(filename);
            containIn = new HashSet<>();
            documents = new ArrayList<>();
        }

        /*
         * purpose: Adds document to the list
         * input: Document d
         */
        public void addDocument(Document d)
        {
            d.ridStopWords(stoplist);
            documents.add(d);
        }

        /*
         * purpose: Searches each document for a single word, updates a list
         * if a word is found and in which document, and outputs
         * contents of the documents if debug is true
         * input: String query, boolean debug
         * result: updating inverted index if word is found
         */
        public String singleWordQuery(String query, boolean debug)
        {
            query = query.toLowerCase();
            containIn = new HashSet<>();
            StringBuilder contents = new StringBuilder();

            for (Document d : documents)
            {
                if (d.hasQuery(query)) {
                    containIn.add(d.documentName());
                    if (debug)
                        contents.append(d.debug());
                }
            }

            if (!(containIn.size() == 0))
                docIndex.put(query, containIn);

            StringBuilder s = new StringBuilder("---- found in "
                + containIn.size() + " documents\n");

            if (containIn.size() != 0)
            {
                for (String s1 : containIn)
                {
                    s.append(s1 + ",");
                }
            }

            return s.toString() + "\n" + contents.toString();
        }

        /*
         * purpose: Searches each document for a phrase, updates a list
         * if the phrase is found and in which document, and outputs
         * contents of the documents if debug is true
         * input: String query, boolean debug
         * result: updating inverted index if phrase is found
         */
        public String multiWordQuery(String query, boolean debug)
        {

```

Dec 09, 20 1:02

CLI.java

Page 3/6

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String[] list = {};
list = query.toLowerCase().split(" ");
containIn = new HashSet<>();
StringBuilder contents = new StringBuilder();

for (Document d : documents)
{
    if (d.hasQuery(list)) {
        containIn.add(d.documentName());
        if (debug)
            contents.append(d.debug());
    }
}

if (!(containIn.size() == 0))
    docIndex.put(query, containIn);

StringBuilder s = new StringBuilder("--- found in "
    + containIn.size() + " documents\n");

if (containIn.size() != 0)
{
    for (String s1: containIn)
    {
        s.append(s1 + ",");
    }

    return s.toString() + "\n" + contents.toString();
}

/*
 * purpose: Dumps the contents of the inverted index
 * result: Outputting the contents of the inverted index
 */
public void debug()
{
    System.out.println("The inverted index contains " + docIndex);
}

// Class that breaks down the file into a list of Strings
class Document
{
    protected String name = "";
    protected ArrayList<String> originalText;
    protected ArrayList<String> editedText;

    /*
     * purpose: Creates the document from the filename
     * input: String fileName
     * result: lists and name of the document are updated
     * if the file exists
     */
    Document(String fileName) throws IOException{
        name = fileName;
        editedText = new ArrayList<>();
        originalText = new ArrayList<>();

        File f = new File(name);
        Scanner file = new Scanner(f);
        int i = 0;
        String [] temp = {};
        String s = "";

        try {
            while (file.hasNextLine())
            {

```

Dec 09, 20 1:02

CLI.java

Page 4/6

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        originalText.add(file.nextLine());
        s = originalText.get(i).toLowerCase();

        // The Delimiter didn't work with this for some reason
        // It also doesn't work on the bee movie script for some reason
        temp = s.replaceAll("[^a-zA-Z]", "").split(" ");
        Collections.addAll(editedText, temp);
        i++;
    }
    file.close();
}

catch (Exception e)
{
    e.printStackTrace();
}

/*
 * purpose: Strips the document of useless words form the stoplist
 * input: Stoplist stoplist
 * result: editedText list is either smaller or the same size
 */
public void ridStopWords(Stoplist stoplist)
{
    ArrayList<String> stop = stoplist.getStoplist();
    for (String s : stop)
    {
        editedText.remove(s);
    }
}

/*
 * purpose: Checks if the documents contain the single word query
 * input: String query
 * result: true if it is found, false otherwise
 */
public boolean hasQuery(String query)
{
    return editedText.contains(query);
}

/*
 * purpose: Checks if the document contains the multi word query
 * input: String array list
 * result: true if all are found, false otherwise
 */
public boolean hasQuery (String [] list)
{
    for (String s : list) {
        if (!this.hasQuery(s))
            return false;
    }
    return true;
}

/*
 * purpose: Retrieves the name of the document
 * result: name of the document is returned
 */
public String documentName()
{
    return name;
}

/*
 * purpose: Dumps the original content of the document
 * result: returns the original content of the document
 */

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Dec 09, 20 1:02

CLI.java

Page 5/6

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public String debug()
{
    StringBuilder s = new StringBuilder(name + " contains:\n");
    for (String s1 : originalText)
    {
        s.append(s1);
    }
    return s.toString();
}

// The command line interface of the program
public class CLI
{
    protected boolean debug;
    protected InvertedIndex ii;

    /*
     * purpose: Process the user's commands
     * input: The command arguments
     * result: display what further the user must do
     */
    public void process(String[] args) throws IOException
    {
        debug = false;

        if (args.length > 1)
        {
            long startTime = System.currentTimeMillis();

            if (args[0].equals("-d"))
            {
                debug = true;
                ii = new InvertedIndex(args[1]);
                for (int i = 2; i < args.length; i++)
                {
                    Document d = new Document(args[i]);
                    ii.addDocument(d);
                }
            }
            else
            {
                ii = new InvertedIndex(args[0]);
                for (int i = 1; i < args.length; i++)
                {
                    Document d = new Document(args[i]);
                    ii.addDocument(d);
                }
            }

            // Taking how long it took to handle the documents
            long stopTime = System.currentTimeMillis();
            long elapsedTime = stopTime - startTime;
            System.out.println("@@ Adding documents took "
                + elapsedTime + " ms");
            Scanner scan = new Scanner (System.in);
            String taken = "";

            while (!taken.equals("-stop"))
            {
                System.out.println("What word or phrase would you like to look for? > ");
                taken = scan.nextLine();

                if (!taken.equals("-stop")) {
                    if (taken.equals("@@debug"))
                        ii.debug();
                }
            }
        }
    }
}

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Dec 09, 20 1:02

CLI.java

Page 6/6

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        else if (taken.contains(" "))
            System.out.println(ii.multiWordQuery(taken, debug));
        else
            System.out.println(ii.singleWordQuery(taken, debug));
    }
}

else
{
    System.out.println("Usage: java CLI [-d] stoplist documents" +
        "\n\t-d      Displays contents of the document" +
        "\n\tstoplist  List that contains words not needed" +
        "\n\tdocument(s) Documents to be searched through" +
        "\n\nTo stop the program, type -stop");
}

/*
 * purpose: Run the program
 * input: Commands from the user
 * result: Documents are searched and outputted
 */
public static void main (String [] args) throws IOException
{
    CLI cli = new CLI();
    cli.process(args);
}
}

```