A screenshot of a computer program

Description automatically generated

import java.util.HashMap;

import java.util.ArrayList;

public class Main {

public static void lookup(Character specialCharacter) {

// Create the mapping of tokens and lexeme

HashMap<Character, String> tokenMap = new HashMap<Character, String>();

tokenMap.put('=', "20");

tokenMap.put('+', "21");

tokenMap.put('-', "22");

tokenMap.put('\*', "23");

tokenMap.put('/', "24");

tokenMap.put('(', "25");

tokenMap.put(')', "26");

tokenMap.put(';', "27");

tokenMap.put(',', "28");

if (tokenMap.containsKey(specialCharacter)) {

System.out.println("Token is: " + tokenMap.get(specialCharacter) + " Lexeme is: " + specialCharacter);

} else {

System.out.println("Invalid lexeme: " + specialCharacter);

}

}

public static String toString(ArrayList<Character> lexemeArray) {

StringBuilder sb = new StringBuilder();

for (Character c : lexemeArray) {

sb.append(c);

}

return sb.toString();

}

public static Boolean isWhitespace(Character c) {

return Character.isWhitespace(c);

}

public static void main(String[] args) {

// reserved keyword

String RESERVED\_WORD = "int";

// collect user input

String userInput = System.console().readLine();

// create ArrayList to hold the lexemes as they are parsed

ArrayList<Character> lexemeArray = new ArrayList<>();

// iterate over user input

int i = 0;

while (i < userInput.length()) {

if (isWhitespace(userInput.charAt(i))) {

i++;

continue;

}

char c = userInput.charAt(i);

int j = i;

// letters (identifier) is token code 11

if (Character.isLetter(c)) {

while (j < userInput.length() && !isWhitespace(userInput.charAt(j)) && Character.isLetter(userInput.charAt(j))) {

lexemeArray.add(userInput.charAt(j++));

}

// Check if lexeme is reserved

if (RESERVED\_WORD.equals(toString(lexemeArray))) {

// RESERVED token code 12

System.out.println("Token is: 12 " + "Lexeme is: " + toString(lexemeArray));

} else {

// identifier code 11

System.out.println("Token is: 11 " + "Lexeme is: " + toString(lexemeArray));

}

// set I to J location to avoid iterating over characters twice

i = j;

// clear the lexeme array and start fresh

lexemeArray.clear();

// INT\_LIT is token code 10

} else if (Character.isDigit(c)) {

while (j < userInput.length() && !isWhitespace(userInput.charAt(j)) && Character.isDigit(userInput.charAt(j))) {

lexemeArray.add(userInput.charAt(j++));

}

System.out.println("Token is: 10 " + "Lexeme is: " + toString(lexemeArray));

i = j;

lexemeArray.clear();

} else if (!isWhitespace(c)) {

lookup(c);

i++;

}

}

}

}