**LAB ASSIGNMENT NO. 3**

Name: Dhawal Sakharwade

Roll No. : - 56

PRN no. : 12111400

**Problem Statement : Macro Expansion with arguments.**

Code:

import java.io.BufferedReader;

import java.io.FileReader;

import java.io.FileWriter;

import java.io.IOException;

import java.util.Iterator;

import java.util.LinkedHashMap;

public class MacroProcessor {

public static void main(String[] args) throws IOException {

BufferedReader br = new BufferedReader(new FileReader("input.asm"));

FileWriter mnt = new FileWriter("mnt.txt");

FileWriter mdt = new FileWriter("mdt.txt");

FileWriter pnt = new FileWriter("pntab.txt");

FileWriter ir = new FileWriter("intermediate.txt");

FileWriter expandedCode = new FileWriter("expanded\_code.txt");

LinkedHashMap<String, Integer> pntab = new LinkedHashMap<>();

String line;

String macroName = null;

int mdtp = 1, kp = 0, pp = 0, flag = 0;

while ((line = br.readLine()) != null) {

String[] parts = line.split("\\s+");

if (parts[0].equalsIgnoreCase("MACRO")) {

flag = 1;

line = br.readLine();

parts = line.split("\\s+");

macroName = parts[0];

if (parts.length <= 1) {

mnt.write(parts[0] + "\t" + pp + "\t" + "\t" + mdtp + "\n");

continue;

}

for (int i = 1; i < parts.length; i++) // processing of parameters

{

parts[i] = parts[i].replaceAll("[&,]", "");

if (parts[i].contains("=")) {

++kp;

String keywordParam[] = parts[i].split("=");

pntab.put(keywordParam[0], pp++);

} else {

pntab.put(parts[i], pp++);

}

}

mnt.write(parts[0] + "\t" + pp + "\t" + "\t" + mdtp + "\t" + "\n");

kp = 0;

} else if (parts[0].equalsIgnoreCase("MEND")) {

mdt.write(line + "\n");

flag = pp = 0;

mdtp++;

pnt.write(macroName + ":\t");

Iterator<String> itr = pntab.keySet().iterator();

while (itr.hasNext()) {

pnt.write(itr.next() + "\t");

}

pnt.write("\n");

pntab.clear();

} else if (flag == 1) {

for (int i = 0; i < parts.length; i++) {

if (parts[i].contains("&")) {

parts[i] = parts[i].replaceAll("[&,]", "");

mdt.write("(P," + pntab.get(parts[i]) + ")\t");

expandedCode.write("(P," + pntab.get(parts[i]) + ")\t");

} else {

mdt.write(parts[i] + "\t");

expandedCode.write(parts[i] + "\t");

}

}

mdt.write("\n");

expandedCode.write("\n");

mdtp++;

} else {

ir.write(line + "\n");

}

}

br.close();

mdt.close();

mnt.close();

ir.close();

pnt.close();

expandedCode.close();

System.out.println("Macro Pass 1 Processing done. Check all outputs. Thank you :)");

}

}  
  
  
**Input:**

**LOAD A**

**STORE B**

**MACRO**

**ADD1 ARG**

**LOAD X**

**STORE ARG**

**MEND**

**MACRO**

**ADD5 A1, A2, A3**

**STORE A2**

**ADD1 5**

**ADD1 10**

**LOAD A1**

**LOAD A3**

**MEND**

**ADD5 D1, D2, D3**

**END  
  
Output:**

**Mdt:**

**LOAD X**

**STORE ARG**

**MEND**

**STORE A2**

**ADD1 5**

**ADD1 10**

**LOAD A1**

**LOAD A3**

**MEND**