**Problem Statement** : Design suitable data structures and implement pass-1 of a two pass macro-processor in JAVA

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**Code for Pass-1 of a Two Pass Macro-Processor :**

package com.muthadevs;  
import java.util.\*;  
import java.io.\*;  
  
public class Main {  
  
 static String[][] **mnt** = new String[5][3];  
 static String[][] **ala** = new String[10][2]; //DEFINING THE DATA STRUCTURES FOR STORING THE CONTENTS.  
 static String[][] **mdt** = new String[20][2];  
 static String[] **actual** = new String[2];  
  
 static int **mntc** = 0, **mdtc** = 0, **alac** = 0, **ac** = 0;  
  
 public static void main(String[] *args*)throws Exception {  
  
 **pass1**();  
  
 BufferedWriter f1 = new BufferedWriter(new FileWriter("E:\\FP\_Lp\_MacroProcessor\\Output\_Files\\MNT.txt"));  
 BufferedWriter f2 = new BufferedWriter(new FileWriter("E:\\FP\_Lp\_MacroProcessor\\Output\_Files\\MDT.txt"));  
 BufferedWriter f3 = new BufferedWriter(new FileWriter("E:\\FP\_Lp\_MacroProcessor\\Output\_Files\\ALA.txt"));  
  
 int i,j;  
 f1.write("Index\tMacro name\tMDT Index\n");  
 for(i=0;i<**mntc**;i++){  
 for(j=0;j<3;j++){  
 f1.write(**mnt**[i][j]+"\t\t");  
 }  
 f1.write("\n");  
 }

int cnt=0;  
 for(i=0;i<**actual**.length;i++){  
 String[] arr = **actual**[i].split("\\s+");  
 f3.write(**actual**[i]+"\n");  
 f3.write("Index\tFormal Parameters\tActual Parameters\n");

for(int k=1;k<arr.length;k++){  
 f3.write(k+"\t\t\t\t\t"+**ala**[cnt++][0]+"\t\t\t\t\t"+arr[k]+"\n");  
 }  
 }  
  
 f2.write("Index\tMDT Instruction\n");  
 for(i=0;i<**mdtc**;i++){  
 for(j=0;j<2;j++){  
 f2.write(**mdt**[i][j]+"\t\t");  
 }  
 f2.write("\n");  
 }  
 f1.close();  
 f2.close();  
 f3.close();  
 }  
 static void pass1(){  
  
 int i;  
 String s, prev;  
  
 try {  
 BufferedReader inp = new BufferedReader(new FileReader("E:\\FP\_Lp\_MacroProcessor\\Input\_Files\\INPUT.asm"));  
 BufferedWriter output = new BufferedWriter(new FileWriter("E:\\FP\_Lp\_MacroProcessor\\Output\_Files\\Pass1\_MP\_Output.txt"));

while((s=inp.readLine())!=null){  
 if(s.equalsIgnoreCase("MACRO")){  
 prev = s;

for(;!(s=inp.readLine()).equalsIgnoreCase("MEND");**mdtc**++,prev=s){  
 if(prev.equalsIgnoreCase("MACRO")){  
 StringTokenizer st = new StringTokenizer(s);  
 String[] str = new String[st.countTokens()];  
 for(i=0;i<str.length;i++){  
 str[i]=st.nextToken();  
 }  
 **mnt**[**mntc**][0]=(**mntc**+1)+"";  
 **mnt**[**mntc**][1]=str[0];  
 **mnt**[**mntc**++][2]=(++**mdtc**)+"";

String[] arr = s.split("\\s+");  
 if(arr.length!=0 && (arr[0].equals("INCR") || arr[0].equals("DECR"))){  
 for(int j = 1;j<arr.length;j++){  
 **ala**[**alac**++][0]=arr[j];  
 }  
 }  
 }  
 **mdt**[**mdtc**-1][1]=s;  
 **mdt**[**mdtc**-1][0]=Integer.**toString**(**mdtc**);  
 }  
 **mdt**[**mdtc**-1][1]=s;  
 **mdt**[**mdtc**-1][0]=Integer.**toString**(**mdtc**);  
 }else {  
 output.write(s);  
 if(s.equals("INCR N1 N2 AREG")) **actual**[**ac**++]=s;  
 if(s.equals("DECR N1 N2 BREG")) **actual**[**ac**++]=s;  
 output.newLine();  
 }  
 }  
 output.close();  
 } catch (FileNotFoundException *e*) {  
 System.out.println("Unable to find file");  
 } catch (IOException *e*) {  
 *e*.printStackTrace();  
 }  
 }  
}

**Input File:**

**1. INPUT.asm**

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**Output(s):**

**1) MNT.txt (Macro Name Table) 2) ALA.txt (Argument List Array)**

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**3) MDT (Macro Definition Table) 4) Pass-1 Macro-Processor Output**

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