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# Assignment No. 03 [PASS-1 Macroprocessor]

**Problem Satement**: Design suitable data structures and implement pass-I of a two-pass macro-processor using OOP features in Java.

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## 1. Pass 1 Macro Code:

```
import java.io.BufferedReader;
import java.io.FileReader;
import java.io.FileWriter;
import java.io.IOException;
import java.util.HashMap;

public class macroPass1 {
	public static void main(String[] Args) throws IOException{
		BufferedReader b1 = new BufferedReader(new FileReader("input.txt"));
		FileWriter f1 = new FileWriter("intermediate.txt");
		FileWriter f2 = new FileWriter("mnt.txt");
		FileWriter f3 = new FileWriter("mdt.txt");
		FileWriter f4 = new FileWriter("kpdt.txt");
		HashMap<String,Integer> pntab=new HashMap<String,Integer>();
		String s;
		int paramNo=1,mdtp=1,flag=0,pp=0,kp=0,kpdtp=0;
		while((s=b1.readLine())!=null){
			String word[]=s.split("\\s");			//separate by space
			if(word[0].compareToIgnoreCase("MACRO")==0){
				flag=1;
				if(word.length<=2){

	f2.write(word[1]+"\t"+pp+"\t"+kp+"\t"+mdtp+"\t"+(kp==0?kpdtp:(kpdtp+1))+"\n");
					continue;
				}
				String params[]=word[2].split(",");
				for(int i=0;i<params.length;i++){
					if(params[i].contains("=")){
						kp++;
						String keywordParam[]=params[i].split("=");

	pntab.put(keywordParam[0].substring(1,keywordParam[0].length()),paramNo++);
						if(keywordParam.length==2)

	f4.write(keywordParam[0].substring(1,keywordParam[0].length())+"\t"+keywordParam[1]+"\n");
						else

	f4.write(keywordParam[0].substring(1,keywordParam[0].length())+"\t"+"-"+"\n");

					}
					else{

	pntab.put(params[i].substring(1,params[i].length()),paramNo++);
						pp++;
					}
				}

	f2.write(word[1]+"\t"+pp+"\t"+kp+"\t"+mdtp+"\t"+(kp==0?kpdtp:(kpdtp+1))+"\n");
				kpdtp+=kp;
```

```
                        }
                        else if(word[0].compareToIgnoreCase("MEND")==0){
                                f3.write(s+'\n');
                                flag=pp=kp=0;
                                mdtp++;
                                paramNo=1;
                                pntab.clear();
                        }
                        else if(flag==1){
                                for(int i=0;i<s.length();i++){
                                        if(s.charAt(i)=='&'){
                                                i++;
                                                String temp="";
                                                while(!(s.charAt(i)==' '||s.charAt(i)==',')){
                                                        temp+=s.charAt(i++);
                                                        if(i==s.length())
                                                                break;

                                                }
                                                i--;
                                                f3.write("#"+pntab.get(temp));
                                        }
                                        else
                                                f3.write(s.charAt(i));
                                }
                                f3.write("\n");
                                mdtp++;
                        }
                        else{
                                f1.write(s+'\n');
                        }
                }
                b1.close();
                f1.close();
                f2.close();
                f3.close();
                f4.close();
        }
}

/*
```

**OUTPUT**:

```
ubuntu-ubuntu@ubuntu-HP:~/SPOSL$ javac macroPass1.java
ubuntu-ubuntu@ubuntu-HP:~/SPOSL$  java macroPass1
ubuntu-ubuntu@ubuntu -HP:~/SPOSL$  cat intermediate.txt
M1 10,20,&b=CREG
M2 100,200,&u=AREG,&v=BREG

ubuntu-ubuntu@ubuntu -HP:~/SPOSL$  cat mnt.txt
M1      2       2       1       1
M2      2       2       7       3
M3      2       0       13      4

ubuntu-ubuntu@ubuntu -HP:~/SPOSL$  cat mdt.txt
MOVE #3,#1
ADD #3,='1'
MOVER #3,#2
M2 69,169
ADD #3,='5'
MEND
```

```
MOVER #3,#1
MOVER #4,#2
M3 73,173
ADD #3,='15'
ADD #4,='10'
MEND
ADD #1,#2
MEND

ubuntu-ubuntu@ubuntu -HP:~/SPOSL$  cat kpdt.txt
a           AREG
b           -
u           CREG
v           DREG

*/
```