

```
1 package Macroprocessor;
2
3 import java.io.*;
4 import java.util.*;
5
6 public class Pass2 {
7     private final Map<String, Integer> MNT = new HashMap<>();
8     private final List<String> MDT = new ArrayList<>();
9     private final List<String> intermediateCode = new ArrayList<>();
10    private final List<String> outputCode = new ArrayList<>();
11
12    public Pass2() {
13        // Simulating already available MNT, MDT, and intermediate code from Pass-I
14
15        // Macro Name Table: Macro name → MDT index
16        MNT.put("INCR", 0);
17
18        // Macro Definition Table
19        MDT.add("INCR &ARG");
20        MDT.add("ADD &ARG, =1");
21        MDT.add("MEND");
22
23        // Intermediate Code (no macro definitions)
24        intermediateCode.add("START");
25        intermediateCode.add("MOV A, B");
26        intermediateCode.add("INCR A");
27        intermediateCode.add("END");
28    }
29
30    public void expandMacros() {
31        for (String line : intermediateCode) {
32            String[] tokens = line.trim().split("\\s+");
33
34            if (tokens.length == 0) continue;
35
36            String macroName = tokens[0];
37
38            if (MNT.containsKey(macroName)) {
39                int index = MNT.get(macroName);
40                String actualArg = tokens.length > 1 ? tokens[1] : "";
41
42                // Skip the macro header in MDT
43                index++;
44
45                while (!MDT.get(index).equalsIgnoreCase("MEND")) {
46                    String defLine = MDT.get(index);
47
48                    // Replace formal argument with actual argument
49                    String expandedLine = defLine.replace("&ARG", actualArg);
50
51                    outputCode.add(expandedLine);
52
53                    index++;
54
55                }
56            }
57        }
58    }
59}
```

```
50             outputCode.add(expandedLine);
51             index++;
52         }
53     } else {
54         outputCode.add(line);
55     }
56 }
57 }
58
59 public void displayOutput() {
60     System.out.println("≡≡ Final Output Code ≡≡");
61
62     try (BufferedWriter writer = new BufferedWriter(new
63             FileWriter("output.txt"))) {
64         for (String line : outputCode) {
65             System.out.println(line);           // Console output
66             writer.write(line + "\n");        // Write to output.txt
67         }
68         System.out.println("Output written to output.txt");
69     } catch (IOException e) {
70         System.out.println("Error writing to file: " + e.getMessage());
71     }
72 }
73
74 public static void main(String[] args) {
75     Pass2 pass2 = new Pass2();
76     pass2.expandMacros();
77     pass2.displayOutput();
78 }
```