

```
1 import java.io.IOException;
2
3 public class KeyboardMain {
4
5     public static void main(String[] args) throws IOException {
6
7         System.out.println("Beginning to rearrange, please wait...");
8
9         // First swap
10        double bestCost = 1000;
11        char[] bestKeyboard = new char[26];
12        double cost = 0;
13
14        char[] original = KeyboardArranger.keyboard;
15        double originalCost = KeyboardArranger.returnCost();
16
17        for (int i = 0; i < 106; i++) {
18            KeyboardArranger.keyboardSwap();
19            cost = KeyboardArranger.returnCost();
20            if (cost < bestCost) {
21                bestCost = cost;
22                bestKeyboard = KeyboardArranger.referenceKeyboard.clone();
23            }
24        }
25        System.out.println(bestCost);
26        for (char c: bestKeyboard)
27            System.out.print(c);
28        System.out.println("");
29
30        // Second swap
31        KeyboardArranger.keyboard = bestKeyboard;
32
33        for (int i = 0; i < 106; i++) {
34            KeyboardArranger.keyboardSwap();
35            cost = KeyboardArranger.returnCost();
36            if (cost < bestCost) {
37                bestCost = cost;
38                bestKeyboard = KeyboardArranger.referenceKeyboard.clone();
39            }
40        }
41        System.out.println(bestCost);
42        for (char c: bestKeyboard)
43            System.out.print(c);
44        System.out.println("");
45        //Third swap
46        KeyboardArranger.keyboard = bestKeyboard;
47
48        for (int i = 0; i < 106; i++) {
49            KeyboardArranger.keyboardSwap();
50            cost = KeyboardArranger.returnCost();
51            if (cost < bestCost) {
52                bestCost = cost;
53                bestKeyboard = KeyboardArranger.referenceKeyboard.clone();
54            }
55        }
56
57        System.out.println("");
58
59        System.out.println("Original Keyboard:");
```

```
60     System.out.println("Cost: " + originalCost);
61     for (char c : original)
62         System.out.print(c);
63
64     System.out.println("");
65
66     System.out.println("Keyboard with lowest cost:");
67     System.out.println("Cost: " + bestCost);
68     for (char c : bestKeyboard)
69         System.out.print(c);
70 }
71 }
72
```