```
 1: // Copyright 2023 Thomas O'Connor
 2: #ifndef EDISTANCE_HPP
 3: #define EDISTANCE_HPP
 4:
 5: #include <algorithm>
 6: #include <cctype>
 7: #include <fstream>
 8: #include <iomanip>
 9: #include <iostream>
10: #include <string>
11: #include <list>
12: #include <utility>
13: #include <SFML/System.hpp>
14:
15: using std::cout;
16: using std::endl;
17: using std::pair;
18: using std::setw;
19: using std::string;
20:
21: class EDistance {
22:  public:
23:   // Constructor + Destructor
24:   EDistance(const string& lOp, const string& rOp);
25:   ~EDistance () { delete [] matrix; }
26:
27:   // interactor functions
28:   int penalty(char a, char b) const { return a != b; }
29:   int min(int a, int b, int c) const;
30:   int optDistance();
31:   string alignment();
32:
33:   // debug functions
34:   void printMatrix();
35:
36:  private:
37:   int* matrix;
38:   std::list<pair<int, int>> optPath;
39:   // dimensions of the matrix, string.size()+1; N = x; M = y;
40:   int _M, _N;
41:   string _MString, _NString;
42: };
43:
44: #endif
```