

```
1
2 // COS30008, Midterm, Problem 2, 2022
3
4 #include "Vigenere.h"
5
6 using namespace std;
7
8 void Vigenere::initializeTable()
9 {
10     for ( char row = 0; row < CHARACTERS; row++ )
11     {
12         char lChar = 'B' + row;
13
14         for ( char column = 0; column < CHARACTERS; column++ )
15         {
16             if ( lChar > 'Z' )
17                 lChar = 'A';
18
19             fMappingTable[row][column] = lChar++;
20         }
21     }
22 }
23
24 Vigenere::Vigenere(const std::string& aKeyword) :
25     fKeyword(aKeyword),
26     fKeywordProvider(aKeyword)
27 {
28     fMappingTable[CHARACTERS][CHARACTERS];
29     initializeTable();
30 }
31
32 std::string Vigenere::getCurrentKeyword()
33 {
34     string result;
35     for (size_t i = 0; i < fKeyword.length(); i++)
36     {
37         char temp = *fKeywordProvider;
38         fKeywordProvider << temp;
39         result += fKeyword[i];
40     }
41     return result;
42 }
43
44 void Vigenere::reset()
45 {
46     fKeywordProvider.initialize(fKeyword);
47 }
48
49 char Vigenere::encode(char aCharacter)
```

```
50 {
51
52     if (!isalpha(aCharacter)) {
53         return aCharacter;
54     }
55
56     char rawKey = *fKeywordProvider;
57     char key = toupper(rawKey) - 'A' + 1;
58     char lCharacter = toupper(aCharacter) - 'A' - 1;
59     char result = fMappingTable[key][lCharacter];
60     fKeywordProvider << aCharacter;
61
62     if (isupper(aCharacter)) {
63         return toupper(result);
64     }
65     return tolower(result);
66 }
67
68 char Vigenere::decode(char aCharacter)
69 {
70     if (!isalpha(aCharacter)) {
71         return aCharacter;
72     }
73
74     char rawKey = *fKeywordProvider;
75     char key = toupper(rawKey) - 'A';
76     char encodedChar = toupper(aCharacter);
77
78     char result;
79     for (size_t i = 0; i < CHARACTERS; i++) {
80
81         char columnChar = fMappingTable[key][i];
82
83         if (encodedChar == columnChar) {
84             result = i + 'A';
85             break;
86         }
87     }
88     fKeywordProvider << result;
89
90     if (isupper(aCharacter)) {
91         return toupper(result);
92     }
93     return tolower(result);
94 }
95
```