

```
1 #define _CRT_SECURE_NO_WARNINGS
2 #include <stdio.h>
3 #include <string.h>
4 #define max_string_size 100
5 #define max_pattern_size 100
6
7 int pmatch(char* string, char* pat);
8 void fail(char* pat);
9
10 int failure[max_pattern_size];
11 char string[max_string_size];
12 char pat[max_pattern_size];
13
14 int main() {
15     FILE* fp = (FILE*)fopen("kmp.txt", "r");
16     fscanf(fp, "%s", string);
17     fscanf(fp, "%s", pat);
18     fail(pat);
19     printf("%d", pmatch(string, pat));
20     return 0;
21 }
22
23 int pmatch(char* string, char* pat) {
24     /*Knuth, Morris, Pratt string matching algorithm*/
25     int i = 0, j = 0;
26     int lens = (int)strlen(string);
27     int lenp = (int)strlen(pat);
28
29     while (i < lens && j < lenp) {
30         if (string[i] == pat[j]) {
31             i++; j++;
32         }
33         else if (j == 0) i++;
34         else j = failure[j - 1] + 1;
35     }
36     return ((j == lenp) ? (i - lenp) : -1);
37 }
38
39 void fail(char* pat) {
40     /*compute the pattern's failure function*/
41     int i = 0, n = (int)strlen(pat);
42     failure[0] = -1;
43     for (int j = 1; j < n; j++) {
44         i = failure[j - 1];
45         while ((pat[j] != pat[i + 1]) && (i >= 0))
46             i = failure[i];
47         if (pat[j] == pat[i + 1])
48             failure[j] = i + 1;
49         else failure[j] = -1;
50     }
51 }
```