

### 1.4.1. Rotate String

**Problem Statement:** Given two strings *s* and *goal*, return true if and only if *s* can become *goal* after some number of shifts on *s*. A shift on *s* consists of moving the leftmost character of *s* to the rightmost position.

**Code:**

```
class Solution {  
public:  
    bool rotateString(string s, string goal) {  
        if (s.length() != goal.length())  
            return false;  
        if (s.length() == 0)  
            return true;  
        string temp = s + s;  
        return temp.find(goal) != string::npos;  
    }  
};
```

### 1.4.2. Find the Index of the First Occurrence in a String

**Problem Statement:** Given two strings needle and haystack, return the index of the first occurrence of needle in haystack, or -1 if needle is not part of haystack.

**Code:**

```
class Solution {
public:
    vector<int> computeLPS(string pattern) {
        int n = pattern.length();
        vector<int> lps(n, 0);
        int len = 0;
        int i = 1;
        while (i < n) {
            if (pattern[i] == pattern[len]) {
                len++;
                lps[i] = len;
                i++;
            } else {
                if (len != 0) {
                    len = lps[len - 1];
                } else {
                    lps[i] = 0;
                    i++;
                }
            }
        }
        return lps;
    }
    int strStr(string haystack, string needle) {
        int m = haystack.length();
        int n = needle.length();
        if (n == 0) return 0;
        if (m < n) return -1;
        vector<int> lps = computeLPS(needle);
```

```

int i = 0;
int j = 0;
while (i < m) {
    if (needle[j] == haystack[i]) {
        i++;
        j++;
    }
    if (j == n) {
        return i - j;
    }
    else if (i < m && needle[j] != haystack[i]) {
        if (j != 0) {
            j = lps[j - 1];
        }
        else {
            i++;
        }
    }
}
return -1;
}
};

```