

Run Length Encoding

Given an input string, write a function that returns the Run Length Encoded string for the input string.

For example, if the input string is “wwwaaadexxxxx”, then the function should return “w4a3d1e1x6”.

We strongly recommend that you click here and practice it, before moving on to the solution.

Algorithm:

- a) Pick the first character from source string.
- b) Append the picked character to the destination string.
- c) Count the number of subsequent occurrences of the picked character and append the count to destination string.
- d) Pick the next character and repeat steps b) c) and d) if end of string is NOT reached.

```
#include<stdio.h>
#include<string.h>
#include<stdlib.h>
#define MAX_RLEN 50

/* Returns the Run Length Encoded string for the
   source string src */
char *encode(char *src)
{
    int rLen;
    char count[MAX_RLEN];
    int len = strlen(src);

    /* If all characters in the source string are different,
       then size of destination string would be twice of input string.
       For example if the src is "abcd", then dest would be "a1b1c1d1"
       For other inputs, size would be less than twice. */
    char *dest = (char *)malloc(sizeof(char)*(len*2 + 1));

    int i, j = 0, k;

    /* traverse the input string one by one */
    for(i = 0; i < len; i++)
    {
        /* Copy the first occurrence of the new character */
        dest[j++] = src[i];

        /* Count the number of occurrences of the new character */
        rLen = 1;
        while(i + 1 < len && src[i] == src[i+1])
        {
            rLen++;
            i++;
        }

        /* Store rLen in a character array count[] */
        sprintf(count, "%d", rLen);

        /* Copy the count[] to destination */
        for(k = 0; *(count+k); k++, j++)
        {
            dest[j] = count[k];
        }
    }

    /*terminate the destination string */
    dest[j] = '\0';
    return dest;
}

/*driver program to test above function */
int main()
{
    char str[] = "geeksforgeeks";
    char *res = encode(str);
    printf("%s", res);
    getchar();
}
```

Run on IDE

Time Complexity: O(n)

Asked in: Amazon, CouponDunia, Microsoft

References:

http://en.wikipedia.org/wiki/Run-length_encoding