C Program to Reverse a String

In this tutorial, we will write a program to reverse a string in C language. The C language has a function called "strrev()" which is used to reverse the string. But in this tutorial, we will write our custom function to reverse the string in C language.

For example, we have a string of length 8 as shown in the figure below.

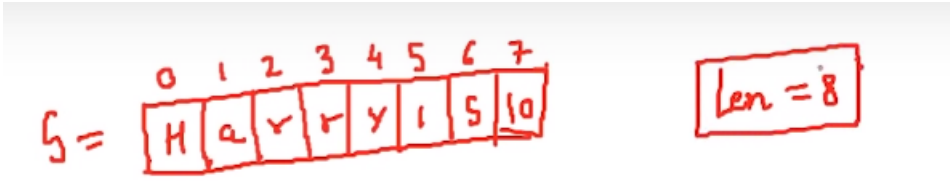

Figure 1: String

As shown in figure 1, we have a string of length 8 which has the characters (H, a, r, r, y, i, s, \0). Note that "\0" notifies that the string is ended and the index for "\0" will not be counted. As shown in figure 2 to reverse the string we will swap the characters.

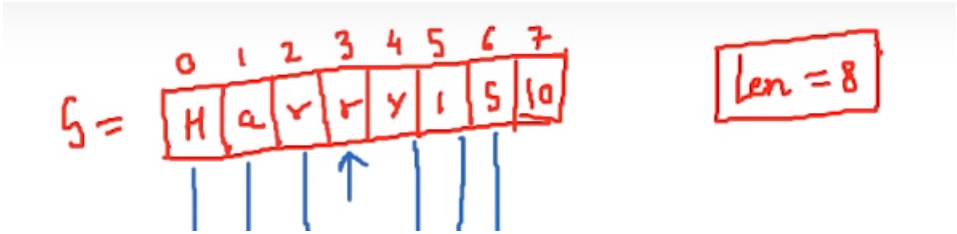

Figure 2: String Reverse

As shown in figure 2, to reverse the string we will swap:

1. The character “H” at index “0” with the character “s” at index “6”,
2. The character ”a” at index “1” with the character “i” at index “5”,
3. The character “r” at index “2” with the character “y” at index “4”,
4. And the character “r” at the index “3” will be swapped by him.

The main thing to note here is that before reversing the string we have to calculate the length of string which is shown in the code snippet below

```
int count = 0;

while (S[count]!=’\0’)

{

Count ++:

}
```

Code snippet 1: String Length Count

As shown in Code snippet 1, the count is the length of the string. The while loop will traverse the whole string until the null character “\0” is found. The main thing to note here is that the null character “\0” is always at the end of the string.

After finding the length of sting we will reverse our sting but the main thing to note here is that we will not traverse our loop till the length of our string. As shown in figure 2, if the length of our string is “7” we will only swap the values till the index “3” and the formula (n-1/2) will be used to determine till what index we have to traverse the loop.

So for example, if the length of the string is “7” then:

1. The character at index “0” will be replaced by “6”

2. The character at index “1” will be replaced by “5”
3. The character at index “2” will be replaced by “4”
4. The character at index “3” will be replaced by “3”

The main thing to note here is that the formula (length - 1- i) will be used to determine the index which will be replaced with the currently selected index. An example program is shown below to reverse a string in C language.

```
int main(){

    char s[] = "Harry";

    char temp;

    int len=0;

    while(s[len]!='\0'){

        len++;

    }

    printf("The length of this string is %d\n", len);
```

Code Snippet 2: Calculate the length of string

As shown in Code snippet 2, we will calculate the length of the string:

1. We have initialized a character string “s” which has a value “Harry”; the string harry will be reversed in this program.
2. We have initialized an integer variable “len” which has a value “0”; the variable “len” will be used to store the length of the string.
3. We have used “while” loop to traverse the string; the “while” loop will check that the character is equal to “\0” or not; if the character is not equal to “\0” then the value of the “len” will be incremented by 1 and the loop will check the next character of the string. The loop will terminate when the “\0” will be found in the string.
4. After the loop ends the total length of the string will be printed

```
for (int i = 0; i < (len-1)/2; i++)
```

```
    {
        temp = s[i];
        s[i] = s[len-1-i];
        s[len-1-i] = temp;
    }
```

Code Snippet 3: Swap the characters of the string

As shown in code snippet 3, we will swap the characters of the string to reverse it:

1. We have used “for” loop for the swapping of the characters of the string; the “for” loop will start from the “0” and runs till “(len-1)/2”; for example, if the length of the string is “7” then the loop will run till “7-1/2” which is equal to “3”.

Note: The main thing to note here is that if we traverse the loop till the length of the string then the characters will be swapped 2 times and we will get the same string in the output instead of a swapped string.

2. Inside the “for” loop body, we have used the “temp” variable to temporarily store the value. In the first iteration of the loop the value of the “i” will be “0”, so the value at “s[0]” will be stored to the “temp” variable; the value at “s[len-1-0]” will be stored to “s[0]” and the value in the temp will be stored back to the “s[len-1-0]”
3. After the loop ends the reverse string will be printed

The output of the following program is shown in the figure below

```
The length of this string is 5
String now is yrraH
```

Figure 3: Program Output

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