Short-term Hands-on Supplementary Course on C programming

Session 6:
Strings

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Agenda

1. Strings
2. Declaration & Initialization of strings
3. Input and output of strings
4. Copying of strings, case conversion, concatenation
5. <string.h> - Library functions
6. Tutorial - Reverse the string
7. Challenge - implementation of reversal by only traversing halfway

Strings

A string of characters is a sequence of data of type char (the ASCII codes) stored in consecutive memory loactions and terminated by the null character ’ \ 0’ (the ASCII value is 0). The null string (of length zero (0)) is the null character only.

Note: Strings are immutable in C

How is it stored?

An 1-D array of type char is used to store a string.

Index	0	1	2	3	4	5	6	7	8	9	10	11
Variable	S	S	N		C	O	L	L	E	G	E	\0
Address	0x23451	0x23452	0x23453	0x23454	0x23455	0x23456	0x23457	…….				x234512

Length of string is 11 [0..11]

Declaration of Strings

Syntax : char String_Variable_name [SIZE] ;

Examples : char city[30]; char name[20]; char message[50];

Initialization of strings

Strings can be initialized in different ways

```
// Double quotes denote string literals
char str1[] = "Hello";

// Size is 6 - Note the null character at end
char str2[] = {'H','e','l','l','o','\0'};

// excess size - remaining is taken to be '\0'
char str[10] = {'H','e','l','l','o'};
```

Reading strings - %s format

```
void main()
{
    char name[25];
    scanf("%s", name);
    printf("Name = %s \n", name);
}
```

Declaration of string

Output

```
Nitheesh
Name = Nitheesh
```

%s reads a string into a character array given the array name or start address.
It ends the string with '\0'

Reading strings - fgets

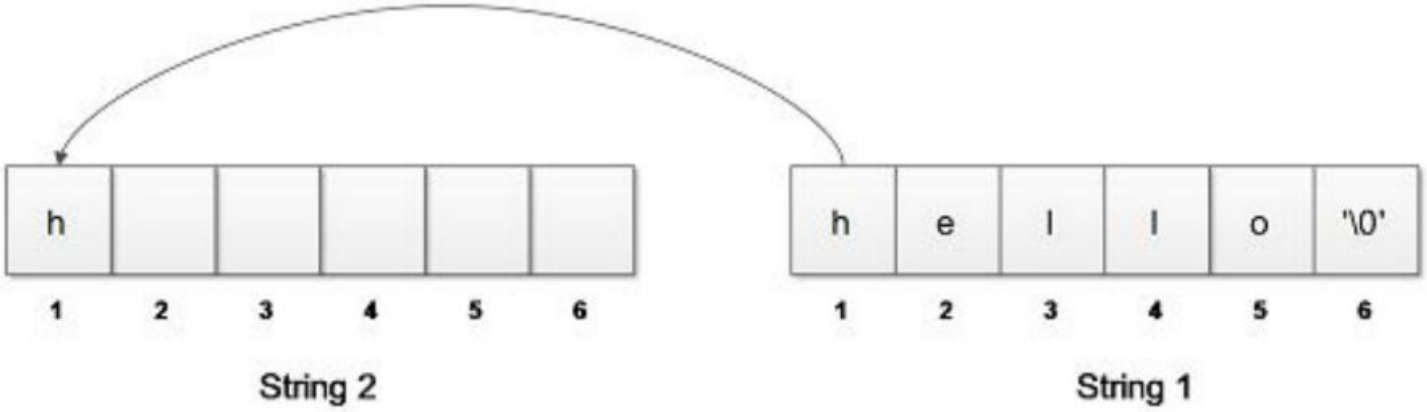
```c
#include<stdio.h>
void main()
{
    char str[20];
    printf("Enter the string: ");
    fgets(str, 20, stdin);
    printf("%s", str);
}
```

```c
#include<stdio.h>
void main()
{
    char str[20];
    printf("Enter the string: ");
    fgets(str, 20, stdin);
    puts(str);
}
```

Both printf or puts can be used to print the string

Live Code Demo - Copy string

The basic idea behind copying one string to another



Live Code Demo - Case conversion

Input - string in uppercase

Output - string in lowercase

```
Enter string 1: THE QUICK BROWN FOX

String 2 (converted): the quick brown fox
```

Live Code Demo - Concatenation

Input - 2 strings
Output - single string with string1 followed by string2

The <string.h> Library

#include <string.h>

Name	Description
strlen	return the length of string not counting \0
strcopy	copies string from source to dest
strncopy	copies n chars from source to dest
strcat	appends string from source to end of dest
strncat	appends n chars from source to end of dest
strcmp	compares two strings alphabetically
strncmp	compares the first n chars of two strings
strstr	finds a string inside another
strtok	breaks string into tokens using delimiters

Tutorial

Write a C program to reverse a string.

Original string	H	E	L	L	O
Reversed string	O	L	L	E	H

Challenge

Implement the same reversal of the string but now you need to traverse half of the string only.

S	S	N	C	O	L	L	E	G	E

Input

Any Questions?

Thank You for attending!

Contact us regarding any questions through email

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