Programming Tip:
Character constants are enclosed in single quotes. String constants are enclosed in double quotes.

In C language, a string is nothing but a null-terminated character array. This means that after the last character, a null character (`'\0'`) is stored to signify the end of the character array. For example, if we write,

```
char str[] = "HELLO";
```


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We are declaring a character array that has five usable characters namely, H, E, L, L, and O. Apart from these characters, a null character ('\0') is stored at the end of the string. So, the internal representation of the string becomes HELLO'\0'. To store a string of length 5, we need 5 + 1 locations (1 extra for the null character). The name of the character array (or the string) is a pointer to the beginning of the string. Figure 6.1 shows the difference between character storage and string storage.

If we had declared str as,

```
char str[5] = "HELLO";
```

Then the null character will not be appended automatically to the character array. This is because, str can hold only 5 characters and the characters in HELLO have already filled the space allocated to it.

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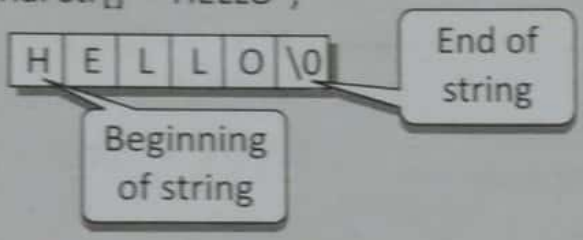
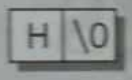
char str[] = "HELLO";



char ch = 'H';

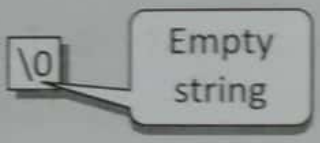
Here H is a character not a string. The character H requires only one memory location.

char str[] = "H";



Here H is a string not a character. The string H requires two memory locations. One to store the character H and another to store the null character.

char str[] = "";



Although C permits empty string, it does not allow an empty character.

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Programming Tip:

When allocating memory space for a character array, reserve space to hold the null character also.

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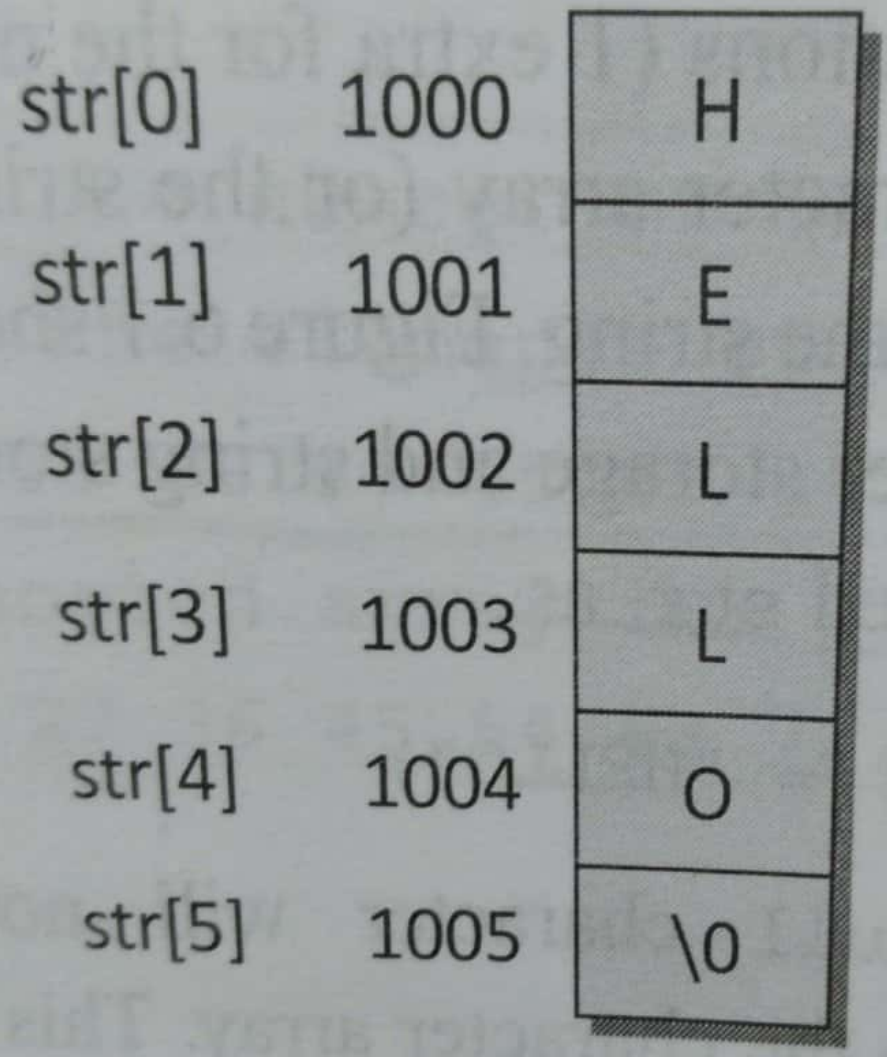

Memory representation of a character array

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6.1.1 Reading Strings

If we declare a string by writing

```
char str[100];
```

Then `str` can be read from the user by using three ways:

1. using `scanf` function
2. using `gets()` function

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3. using `getchar()`, `getch()` or `getche()` function repeatedly

The string can be read using `scanf()` by writing

```
scanf("%s", str);
```


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Programming Tip:
Using & operand with a string variable in the scanf statement generates an error.

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An array name cannot be used as the left operand of an assignment operator. Therefore, the following statement is illegal in C.

```
char str2, str1[]="HI";
str2 = str1;
```


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6.1.2 Writing Strings

The string can be displayed on screen using three ways:

1. using `printf()` function
2. using `puts()` function
3. using `putchar()` function repeatedly

The string can be displayed using `printf()` by writing

```
printf("%s", str);
```


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. Write a program to find the length of a string.

```
#include <stdio.h>
#include <conio.h>
int main()
{
   char str[100], i = 0, length;
   clrscr();
   printf("\n Enter the string :");
   gets(str);
   while(str[i] != '\0')
      i++;
   length = i;
   printff("\n The length of the string is :
   %d", length);
   getch();
}
```

Output

```
Enter the string : HELLO
The length of the string is : 5
```


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if (strcmp (str1, str2) > 0, the str1 is greater than str2

if (strcmp (str1, str2) < 0, the str1 is less than str2

if (strcmp (str1, str2) = 0, the str1 is equal to str2.

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