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C program to read string with spaces using scanf() function

Read string with spaces using scanf() function in C programming language - In this program we are going to explain how we can take input of a string with spaces?

Let's see what happened, when we read a string like another type of input

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```
#include <stdio.h>
int main()
{
    char name[30];
    printf("Enter name: ");
    scanf("%s", name);

    printf("Name is: %s\n", name);
    return 0;
}
```

```
Enter name: Alex
Name is: Alex
```

Output -2 (Enter name with space)

```
Enter name: Alex Thomas
Name is: Alex
```

In both cases variable `name` stored only **"Alex"**; so, this is clear if we read a string by using `"%s"` format specifier, string will be terminated when white space found.

How to read string with spaces in C?

1) Read string with spaces by using `"%[^\n]"` format specifier

The format specifier `"%[^\n]"` tells to the compiler that read the characters until `"\n"` is not found.

Consider the program

```
#include <stdio.h>
int main()
{
    char name[30];
    printf("Enter name: ");
    scanf("%[^\n]", name);

    printf("Name is: %s\n", name);
    return 0;
}
```

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Output

```
Enter name: Alex Thomas
Name is: Alex Thomas
```

See the output, now program is able to read complete string with white space.

Problem -1 [Read string after integer input]

Here, we will read the person age then name and see what will happen? (i.e. we are reading the string after integer input)

Consider the program

```
#include <stdio.h>
int main()
{
    int age;
    char name[30];

    printf("Enter age: ");
    scanf("%d", &age);
    printf("Enter name: ");
    scanf("%[^\\n]", name);

    printf("Name is: %s, age is: %d\\n", name, age);
    return 0;
}
```

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Output

```
Enter age: 23
Enter name: Name is: , age is: 23
```

Oh noooooooooooooooooo!

The `age` input was successful but compiler doesn't wait to read `name` and moves to next statement which was `printf("Name is: %s, age is: %d\n", name, age);` and the output is "Enter name: Name is: , age is: 23" which we didn't expect.

Why this happened?

As we enter an integer value and hit enter to read next value, compiler stores either `enter` or `null` into the string's first character and string input terminates.

Here is the proof?

Here we are printing the value of string's first character by using `printf("Name is: %d, age is: %d\n", name[0], age);` the output will be "Enter name: Name is: 0, age is: 23"

Consider the program

```
#include <stdio.h>
int main()
{
    int age;
    char name[30];

    printf("Enter age: ");
    scanf("%d", &age);
    printf("Enter name: ");
    scanf("%[^\\n]", name);

    printf("Name is: %d, age is: %d\\n", name[0], age);
    return 0;
}
```

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Output

```
Enter age: 23
Enter name: Name is: 0, age is: 23
```

Here compiler stores, null (0) to the string's first character that is name[0]

How to fix it?

We have to read a character from input buffer and store it into temporary variable (remember - if we are going to read string or character after an integer or float (in some cases) input then we should read a temporary character which may available in the input buffer)

I am using a statement `scanf("%c",&temp);` before reading the string (which is going to be read after an integer input).

Consider the program

```
#include <stdio.h>
int main()
{
    int age;
    char name[30];
    char temp;

    printf("Enter age: ");
    scanf("%d",&age);
    printf("Enter name: ");
    scanf("%c",&temp); // temp statement to clear buffer
    scanf("%[^\\n]", name);

    printf("Name is: %s, age is: %d\\n", name, age);
    return 0;
}
```

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Output

```
Enter age: 23
Enter name: Alex Thomas
Name is: Alex Thomas, age is: 23
```

See, now we are able to read complete string (with spaces) after taking an integer input.

Another way to read string with spaces in C

Using fgets()

`fgets()` function requires three parameters

- `char *s` - character pointer (in which string will be stored)
- `int n` - maximum number of character of the string
- `FILE *stream` - a pointer of file stream, we can use "stdin"

`fgets()` will reads the complete string with spaces and also add a new line character after the string input.

Consider the program

```
#include <stdio.h>
int main()
{
    int age;
    char name[30];
    char temp;

    printf("Enter age: ");
    scanf("%d", &age);
    printf("Enter name: ");
```

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```
scanf("%c",&temp); // temp statement to clear buffer
fgets(name,30,stdin);

printf("Name is: %s, age is: %d\n",name,age);
return 0;
}
```

Output

```
Enter age: 23
Enter name: Alex Thomas
Name is: Alex Thomas
, age is: 23
```

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- Relative sorting algorithm
- Finding subarray with given sum
- Find the level in a binary tree with given sum K
- Check whether a Binary Tree is BST (Binary Search Tree) or not
- 1[0]1 Pattern Count
- Capitalize first and last letter of each word in a line
- Print vertical sum of a binary tree
- Print Boundary Sum of a Binary Tree
- Reverse a single linked list
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- Job sequencing problem

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