

Fundamentals of Programming I

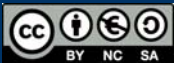
5A

SUPPLEMENT

C Style Character Strings

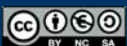
Grado en Ingeniería Informática

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C Style Character Strings

Null terminated character arrays

```
const int Max = 15;
typedef char tString[Max];
tString str = "Hello"; // Initialization at declaration
```

There is always a null character at the end (ASCII code 0 - '\0')

Indicates the array index where the string ends

str	H	e	l	l	o	\0									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

In the string there can be up to MAX-1 characters

Maximum length for strings in variable str: 14

- Literal strings can't be assigned: ~~str = "Hello";~~
- Can't be directly copied: ~~str2 = str1;~~
- Can't be compared directly: ~~if (cad1 < cad2)~~



Input/Output with C Style Strings

```
tString str;
```

```
cin >> str; // Final null is appended
```

Extractor: reading ends with first blank space

It is not tested if more characters than the maximum are read!

setw(): maximum # of characters to read (including final null)

```
✓ cin >> setw(15) >> str;
```

```
✓ cin.getline(C_style_string, max);
```

Also reads blank spaces; no more than max-1

```
cin.getline(str, 15); // 14 characters at most
```

```
cout << str << endl; // Null is not printed
```

C Style Strings:
cin.getline(str, máx)

Strings of type string:
getline(cin, str)



cstring Library

- ✓ `strlen(string)`: Current length of *string*
`cout << "Length: " << strlen(str);`
- ✓ `strcpy(to, from)`: Copies *from* into *to*
`strcpy(str2, str1); strcpy(str, "I like C++");`
- ✓ `strcat(to, from)`: Appends *from* at the end of *to*
`tString str1 = "Hello", str2 = "Bye";`
`strcat(str1, str2); // str1 now contains "HelloBye"`
- ✓ `strcmp(str1, str2)`: Compares the strings lexicographically
0 if equal, 1 if *str1* > *str2* or -1 if *str1* < *str2*
`tString str1 = "Hello", str2 = "Bye";`
`strcmp(str1, str2) // Returns 1 ("Hello" > "Bye")`

...

<http://www.cplusplus.com/reference/clibrary/cstring/>



C Style Strings Example

strings.cpp

```
#include <iostream>
#include <cstring>
using namespace std;

int main() {
    const int MAX = 20;
    typedef char tStr[MAX];
    tStr str = "I like C++";

    cout << str << endl;
    cout << "String: ";
    cin >> str; // Reads until first blank space
    cout << str << endl;
    cin.sync(); // Discards any pending input
    cout << "String: ";
    cin.getline(str, MAX);
```

.../...



C Style Strings Example

```
cout << str << endl;
cout << "Length: " << strlen(str) << endl;
strcpy(str, "Hello");
tStr str2 = " friend";
strcat(str, str2);
cout << str << endl;
if (strcmp(str, str2) == 0)
    cout << "Equal";
else if (strcmp(str, str2) > 0)
    cout << str << " is higher than " << str2;
else
    cout << str << " is lower than " << str2;
cout << endl;

return 0;
}
```



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