

CS 241

Data Organization using C

Strings: char[]

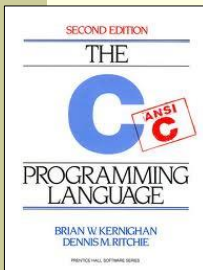
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9/19/2019

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Read: Kernighan & Ritchie



- Due Thursday, Sept 19
 - 4.3: External Variables
 - 4.4: Scope Rules
 - 4.5: Header Files
 - 4.6: Static Variables
- Due Tuesday, Sept 24
 - 4.7: Register Variables
 - 4.8: Block Structure
 - 4.9: Initialization
- Due Thursday, Sept 26
 - 4.10: Recursion

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C Strings: a char Array

- In the C programming Language, there does not exist a String type.
- In C, a string is a *null terminated char* array:

```
1) char str[40];
2) str[0] = 'a';
3) str[1] = 'b';
4) str[2] = 'c';
5) str[3] = '\0'; //null terminated.
6) printf("%c\n",str[0]); //a
7) printf("%c\n",str[1]); //b
8) printf("%s\n",str); //abc
9) printf("%lu\n", sizeof(str)); // 40
```

a	b	c	\0
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Returns a long unsigned int

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C Strings: a char Array

```
1) char str[40];
2) str[0] = 'a';
3) str[1] = 'b';
4) str[2] = 'c';
5) str[3] = '\0';
6) str[4] = 'J';
7) str[5] = 'C';
8) str[6] = '\0';
9) printf("%s\n",str); //abc
10) printf("%s\n",&str[0]); //abc
11) printf("%s\n",&str[4]); //JC
12) printf("%c\n",&str[4]); //J
```

a	b	c	\0
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C Strings: a char Array

When a `char` array is declared with double quotes, C will null terminate the array.

a	b	c	\0
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Library function in
<string.h>

```
1) char str[] = "abc";
2) printf("%c\n",str[0]); //a
3) printf("%s\n",str);    //abc
4)
5) printf("%lu\n", strlen(str)); // 3
6) printf("%lu\n", sizeof(str)); // 4
7) printf("%d\n", str[0]); //97
8) printf("%d\n", str[1]); //98
9) printf("%d\n", str[2]); //99
10) printf("%d\n", str[3]); //0
11) printf("%d\n", str[4]); //??? seg fault?
```

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strlen (sect 2.3)

```
1) #include <stdio.h>
2)
3) int strlen(char s[])
4) {
5)     int i = 0;
6)     while (s[i]) i++;
7)     return i;
8) }
9) void main(void)
10) {
11)     char msg[] = "Hello World!";
12)     int length = strlen(msg);
13)     printf("Length = %d\n", length);
14) }
```

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