

# C++ Programming

## Char Arrays 2

**Mostafa S. Ibrahim**

*Teaching, Training and Coaching since more than a decade!*

*Artificial Intelligence & Computer Vision Researcher*

*PhD from Simon Fraser University - Canada*

*Bachelor / Msc from Cairo University - Egypt*

*Ex-(Software Engineer / ICPC World Finalist)*



# Reading string with spaces

```
4 int main() {  
5  
6     string name1;  
7     getline(cin, name1);  
8     cout<<name1<<"\n";  
9  
10    char name2[50];  
11    cin.getline(name2, 50);  
12    cout<<name2<<"\n";  
13  
14  
15    return 0;  
16 }  
17
```

- Based on the data type, you can read in 2 ways
- Again, we typically use string

Problems Console Tasks

<terminated> ztemp [C/C++ Application]

```
I am mostafa  
I am mostafa  
I am from Egypt  
I am from Egypt
```

# Array of strings

```
4 int main() {  
5  
6     // Array of names - each name is sequence of letters!  
7     string names[5] = {"Mostafa Saad", "Never Ever", "Hello world"};  
8  
9     for (int i = 0; i < 5; ++i)  
10        cout<<names[i]<<"\n";  
11  
12     return 0;  
13 }  
14
```

- We can make array of strings!

Problems Console Tasks Properties Call Graph Search

<terminated> ztemp [C/C++ Application] /home/moustafa/workspaces/eclipse\_cpp/zte  
Mostafa Saad  
Never Ever  
Hello world

# We can read them

- Using cin
- Or use getline for spaces

```
4 int main() {  
5  
6     // Array of names - each name is sequence of letters!  
7     string names[2];  
8  
9     for (int i = 0; i < 2; ++i)  
10        cin>>names[i];  
11  
12    return 0;  
13 }  
14
```

Problems Console Tasks Properties Call Graph Search

<terminated> ztemp [C/C++ Application] /home/moustafa/workspaces/eclipse  
mostafa  
saad  
|

# Escape characters

```
3
4 int main() {
5
6     // Escape characters
7     cout<<"hello\tworld\n";
8     cout<<"\0";
9     cout<<"Let's print a double quote \" ";
10
11     return 0;
12 }
13
14
```

Problems Console Tasks Properties 1010 0101 Call G

```
<terminated> ztemp [C/C++ Application] /home/moustafa/wor
hello    world
Let's print a double quote " |
```

- Starts with \
  - \n = new line
  - \t = tab
  - \0 = null
  - \" = “

# Char Arrays vs String

- Char Array is just array, a primitive data type
  - It is more a C-Style
  - You need to carefully handle the null
- String is not a primitive. It is a class (later)
  - It is a C++ style
    - `string name {"mostafa"};`
  - It is part of the STL Library
    - Later we learn it and learn more of C++ string capabilities
  - It supports a lot of convenient features (e.g. `name1 + name2`) and comparisons
  - Please use it. You rarely need to use C-style char array

# Definitions

- Let say we have string aaabcdefgg
- **Prefix:** Any string starts from the first character (n prefixes)
  - a, aa, aaa, aaab, aaabc, ..... aaabcdefgg
- **Suffix:** Any string sends at the last character (n suffixes)
  - g, gg, fgg, efgg, .... Aaabcdefgg
- **Substring:** Starts wherever and end wherever, but **consecutive**
  - E.g. of length 3: aaa, aab, abc, cde, def, efg, fgg. Same as *subarray*.
- **Sub-sequence:** Not **consecutive** but must be in order
  - In order: Next letter must has bigger index
  - adef, bgg, aeg, cdgg
    - aeg indices: 0 5 8
  - But not: gga, ed, aca

# Practice Like an array

- Read a string, and print its reverse
- Read a string and print YES if [palindrome](#)
- Read a string and count the [frequency](#) of each digit
- ...
- They are solved the same as a normal array. Just access the array
  - You may need to change the letter
  - E.g. convert digit char '8' to integer number 8
    - E.g. `int digit = char - '0'`



*“Acquire knowledge and impart it to the people.”*

*“Seek knowledge from the Cradle to the Grave.”*