

# C++ Programming

## Char Arrays 1

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# Let's refresh about characters

```
4 int main() {  
5     char ch1 = 'A';  
6     int ch_value = ch1;  
7  
8     cout<<ch_value<<"\n";  
9     cout<<(int)'A'<<"\n";  
10    cout<<(int)'B'<<"\n";  
11    cout<<(int)'C'<<"\n";  
12    cout<<(int)'Z'<<"\n";  
13    cout<<(int)'A' + 26 - 1<<"\n";  
14  
15    char ch2 = 90;  
16    cout<<ch2<<"\n";  
17  
18    cout<<"***\n";  
19  
20    cout<<(int)'a'<<"\n";  
21    cout<<(int)'b'<<"\n";  
22    cout<<(int)'c'<<"\n";  
23    cout<<(int)'z'<<"\n";  
24    cout<<(int)'a' + 26 - 1<<"\n";  
25  
26    cout<<('A' < 'a')<<"\n";  
27    return 0;  
28 }
```

<terminat

```
65  
65  
66  
67  
90  
90  
Z  
***  
97  
98  
99  
122  
122  
1  
|
```

# Check and Convert Chars

```
4 int main() {  
5     char ch1 = 'D';  
6  
7     if ('A' <= ch1 && ch1 <= 'Z') {  
8         cout << ch1 << " is an upper case\n";  
9         ch1 = ch1 - 'A' + 'a';  
10        cout << ch1 << " now is a lower case\n";  
11    } else if ('z' <= ch1 && ch1 <= 'z')  
12        cout << ch1 << " is already a lower case\n";  
13    else if ('0' <= ch1 && ch1 <= '9')  
14        cout << ch1 << " is a digit\n";  
15    else  
16        cout << ch1 << " is neither a digit nor a letter\n";  
17  
18    return 0;  
19 }  
20
```

Always remember they are  
just numbers internally

If we have letter 'A'

- Subtract 'A'
- Now this is zero
- Now add 'a'
- This shifts to 'a'
- And so on
- If 'D'  $\Rightarrow$  'D' - 'A' = 3

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D is an upper case  
d now is a lower case  
|

# Accessing string array

```
4 int main() {  
5     string name = "Hany";  
6  
7     int sz = name.size(); // called function/method  
8     cout << sz << "\n"; // 4  
9  
10    cout << name << "\n";  
11  
12    for (int i = 0; i < sz; ++i)  
13        cout << name[i]; // internally array  
14  
15    return 0;  
16 }  
17
```

- We used to read/write string as an item
- String is sequence of characters
- So actually internally an array

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```
4  
Hany  
Hany|
```

# Let's create char array

```
4 int main() {  
5     int numbers[5] = { 1, 2, 3, 4, 5 };  
6  
7     char name1[5] = { 'H', 'a', 'n', 'i' }; // 5 not 4  
8     char name2[5] = "Hani";  
9  
10    string name3 = "Hani";  
11  
12    cout << name1 << "\n";  
13    cout << name2 << "\n";  
14    cout << name3 << "\n";  
15  
16    return 0;  
17 }
```

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Hani  
Hani  
Hani  
|

- We can create array of integers or doubles!
- Let's create array of chars
- Length must be 1 + intended length
- Usually, you will use string as easier way
  - Internally has char array

# The null char

```
3
4 int main() {
5
6     char name1[4];
7     name1[0] = 'H';
8     name1[1] = 'a';
9     name1[2] = 'n';
10    name1[3] = 'i';
11
12    cout << name1 << "\n";
13
14    return 0;
15 }
16
```

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Hani0

- For internal reasons, C++ wants you to tell when the string ends (for easy print)
- We add extra char to do so
- On left, wrong way

# The null char

```
4 int main() {  
5  
6     char name1[5];  
7     name1[0] = 'H';  
8     name1[1] = 'a';  
9     name1[2] = 'n';  
10    name1[3] = 'i';  
11    name1[4] = '\\0';    // Null character  
12  
13    cout << name1 << "\\n";  
14  
15    return 0;  
16 }
```

- The right way
  - 1) 1+size (4 here)
  - 2) Null char: \\0

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Hani

# The null char

```
4 int main() {  
5  
6     char name1[5];  
7     name1[0] = 'H';  
8     name1[1] = '\\0';  
9     name1[2] = 'n';  
10    name1[3] = 'i';  
11    name1[4] = '\\0';    // Null character  
12  
13    cout << name1 << "\\n";  
14  
15    return 0;  
16 }
```

- Print stops once sees the null char
  - Letters after it won't be printed

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H  
|



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

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