**Array and Strings**

I know string is a different topic, but they also used with arrays so it is better to learn them simultaneously

Before moving further, please note the following

* **Array: The Array of int, float, double or any numeric value**
* **Char Array or C Array: The array of Alphabets e.g., a,x,g e.t.c,**
* **Strings: The combination of words e.g., Animal**
* **Strings Array: String saved in an Array**

**We have already learned Array, now we will learn char array:**

char name [30]; // no initialization

char list [10] = {'a', 'b', 'c', 'd'};

// initialized with list of char

// values

char title [20] = "Le Grande Fromage"; // This is a String Array

// initialized at declaration

// with a string

* **Initializing character type array**

char a [8] = {‘p’, ‘a’, ‘k’, ‘I’, ‘s’, ‘t’, ‘a’, ‘n’};

* + Each element occupies one byte of memory.
  + In each element of the array only one character can be stored

**Examples:**

**Consider this program, there will be unusual words in run time because we cannot leave space for the null character**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char a[6] = {'b','a','h','r','i','a'};

cout << a;

\_getch();

return 0;

}

**In this program, we left the space for null character so there is no unusual character in the output**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char a[7] = {'b','a','h','r','i','a'};

cout << a;

\_getch();

return 0;

}

**Some Perfect Examples of initializing and declaring char array**

* Declare character array

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[10];

\_getch();

return 0;

}

* Declare & initialize character array using characters

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[7] = {'b','a','h','r','i','a'};

\_getch();

return 0;

}

* Declare & initialize character array using user input

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[6];

for (int i = 0; i < 6; i++)

cin >> abc[i];

\_getch();

return 0;

}

* Declare & initialize character array using user input and then print Values

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[6];

for (int i=0;i<6;i++)

cin >> abc[i];

for (int j=0;j<6;j++)

cout << abc[j];

\_getch();

return 0;

}

* Initialized character array at the time of declaration using string literal or Literal constant

**Note: The size of array should be more then length of string**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc [30]= "Im going to visit islamabad";

cout<< endl<< abc;

\_getch();

return 0;

}

**If the size of character array is less then the length of string then error will generate**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc [10]= "Im going to visit islamabad";

cout<< endl<< abc;

\_getch();

return 0;

}



* Initialized character array from user input using string literal or Literal constant

**Note: if we enter any name or string in the limit or size of array with or without space it will print fully**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[10];

cin >> abc;

cout << "-------------------\n";

cout << abc;

\_getch();

return 0;

}

**But if the entered string out of range, then, Characters printed until null or space found**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[10];

cin >> abc;

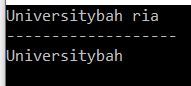
cout << "-------------------\n";

cout << abc;

\_getch();

return 0;

}



**--------------------------------------------------------------------------------------------------------------------**

**Copying one-character array into another**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char a[7] = {'b','a','h','r','i','a'};

char b[7];

for (int i =0;i<7;i++)

b[i] = a[i];

for (int j = 0; j < 7; j++)

cout << b[j];

\_getch();

return 0;

}

**String Literal / Literal Constant & Concept of Null character**

* char word [] = {'H', 'e', 'l', 'l', 'o', '\0'};
* Declaration of an array of 6 elements.
* Type char λ initialized with the characters.
* word "Hello" plus a null character '\0' at the end.
* But arrays of character elements have another way to be initialized: using **string literals** directly.
* specified by enclosing the text between double quotes (").
* For example: “hello”.
* Sequences of characters enclosed in double-quotes (") are **literal constants**.
* Type is null terminated array of characters.
* String literals will always have a (‘\0’) appended at the end.

**Examples:**

**1).**

**We do not left space there for null character, so there is a unusual letters in output**

#include<iostream>

#include<conio.h>

using namespace std;

int main() {

char abc[6] = { 'b','a','h','r','i','a' };

cout << abc;

\_getch();

return 0;

}

**Here, we left 1 space for null character**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[7] = { 'b','a','h','r','i','a' };

cout << abc;

\_getch();

return 0;

}

**Perfect**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[7] = { 'b','a','h','r','i','a','\0' };

cout << abc;

\_getch();

return 0;

}

**2).**

**There will be error because we do not left space for null character**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[6] = "bahria";

cout << abc;

\_getch();

return 0;

}



**Here, we left space for null character so there is no error**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[7] = "bahria";

cout << abc;

\_getch();

return 0;

}

**---------------------------------------------------**

**String Array**

**Example:**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char string1[20];

char string2[] = "String literal";

cout << "Enter the string \"hello there\": ";

cin >> string1;

cout << "string1 is: " << string1 << "\nstring2 is: " << string2;

cout << "\nstring1 with spaces between characters is:\n";

for (int i = 0; string1[i] != '\0'; i++)

cout << string1[i] << " ";

\_getch();

return 0;

}

**Cin.getline() Function**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[20];

cout << "Enter string : ";

cin >> abc;

cout << "-----------------\n";

cout << abc;

\_getch();

return 0;

}

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

const int max = 20;

char str[max];

cout << "\n Enter a string : ";

cin >> str;

cout << "You entered : " << str << endl;

\_getch();

return 0;

}

Here, if we get space in output between any letters so after 1st white space the remaining strings will not print

**So, we must use Cin.getline function.**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char abc[20];

cout << "Enter string : ";

cin.getline(abc, 19, '\0');

cout << "-----------------\n";

cout << abc;

\_getch();

return 0;

}

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

const int max = 40;

char str[max];

cout << "\n Enter a string : ";

cin.getline(str,max);

cout << "You entered : " << str << endl;

\_getch();

return 0;

}

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

const int max = 2000;

char str[max];

cout << "\n Enter a string : ";

cin.get(str, max, '$');

cout << "You entered : " << str << endl;

\_getch();

return 0;

}

**Difference between Char and string**

**Char Array:** We cannot use standard operators

**String Array:** We can use standard operators

**Examples:**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char s1[6] = "Hello";

char s2[5] = "Sir";

s1 = s1 + s2;

s2 = s1;

\_getch();

return 0;

}

There will be errors because we cannot use operators

**Examples:**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

string s1="Hello";

string s2 = "Good morning";

string s3 = "Hennery";

string s4;

string s5(s1);

string s6("Hy Hello");

// s4 = s1 + s2;

// cout << s4;

// s4 = s1;

// cout << s4;

// cout << s5;

cout << s6;

\_getch();

return 0;

}

**String**

**1).**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

string s1="Hello";

string s2 = "Good morning";

string s3 = "Hennery";

string s4;

string s5(s1);

string s6("Hy Hello");

// s4 = s1 + s2;

// cout << s4;

// s4 = s1;

// cout << s4;

// cout << s5;

cout << s6;

\_getch();

return 0;

}

**Coping string**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

char str1[] = "Tiger burning bright in the forests of the night";

const int max = 80;

char str2[max];

strcpy\_s(str2, str1);

cout << "This is str1 ==> " << str1 << endl;

cout << "This is str2 ==> " << str2 << endl;

\_getch();

return 0;

}

**Defining and Assigning string objects**

#include<iostream>

#include<conio.h>

using namespace std;

int main()

{

string s1 = "Man";

string s2 = "Beast";

string s3;

s3 = s1;

cout << "s3 = " << s3 << endl;

s3 = "Neither " + s1 + " nor ";

s3 = s3 + s2;

cout << "s3 = " << s3 << endl;

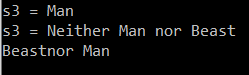
s1.swap(s2);

cout << s1 << "nor " << s2 << endl;

\_getch();

return 0;

}



**input/output with string objects**

#include<iostream>

#include<conio.h>

#include<string>

using namespace std;

int main()

{

string greeting = "Hello, ";

string full\_name, nickname, address;

cout << "Enter your full name : ";

getline(cin, full\_name);

cout << "Your full name is : " << full\_name << endl;

cout << "Enter your nickname : ";

cin >> nickname;

greeting = greeting+ nickname;

cout << greeting << endl;

cout << "Enter your address on separate lines\n";

cout << "Terminate with \"$\" \n";

getline(cin, address,'$');

cout << "Your address is : " << address << endl;

\_getch();

return 0;

}