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Working with Hexadecimal values in C programming language

Hexadecimal value has 16 alphanumeric values from 0 to 9 and A to F, with the base 16. (Read more about Computer number systems), here we will learn **how to work with hexadecimal values in c programming language?**

Representation of Hexadecimal numbers in C programming

In C programming language, a Hexadecimal number is represented by preceding with **"0x"** or **"0X"**, thus the value in Hexadecimal can be written as **"0x64"** (which is equivalent to **100 in Decimal**).

Assigning the Hexadecimal number in a variable

There is no special type of data type to store Hexadecimal values in C programming, Hexadecimal number is an **integer value** and you can store it in the integral type of data types (`char`, `short` or `int`).

Let suppose, we have two values in Hexadecimal **"64"** (100 in Decimal) and **"FAFA"** (64250 in Decimal).

We are storing **"64"** in an unsigned char variable (64 is small value and can be stored with in a Byte) and **"FAFA"** in the `int` variable.

Consider the following statements

```
unsigned char a=0x64;
```

```
unsigned char b=0xFAFA;
```

Printing the number in Hexadecimal format

To print integer number in Hexadecimal format, `"%x"` or `"%X"` is used as format specifier in printf() statement.

"%x" prints the value in Hexadecimal format with alphabets in lowercase (a-f).

"%X" prints the value in Hexadecimal format with alphabets in uppercase (A-F).

Consider the code, which is printing the values of a and b using both formats

Copy

```
int main()
{
	unsigned char a=0x64;
	int b=0xFAFA;

	printf("value of a: %X [%x]\n",a,a);
	printf("value of b: %X [%x]\n",b,b);

	return 0;
}
```

Output

```
    value of a: 64 [64]
    value of b: FAFA [fafa]
```

Reading value in Hexadecimal format

"%x" or "%X" is used with scanf() statement to read the value from the user.

Consider the following code

Copy

```
#include <stdio.h>
int main()
{
	unsigned char a;
	int b;

	printf("Enter value of a: ");
	scanf("%x",&a);
	printf("Enter value of b: ");
	scanf("%x",&b);

	printf("Value of a: Hex: %X, Decimal: %d\n",a,a);
	printf("Value of b: Hex: %X, Decimal: %d\n",b,b);

	return 0;
}
```

Output

```
Enter value of a: 64
Enter value of b: FAFA
Value of a: Hex: 64, Decimal: 100
Value of b: Hex: FAFA, Decimal: 64250
```

Declaring integer array by assigning hexadecimal values

Consider the following example, where integer array is declaring with the Hexadecimal values and printing in both formats Decimal and Hexadecimal.

Copy

```
#include <stdio.h>
int main()
{
        int arr[]={0x64, 0xAB0, 0xA0A0, 0xFAFA, 0x100};
        int i;

        printf("Array elements are\n");
        for(i=0;i<5;i++)
                printf("Decimal: %d, Hex: %X\n",arr[i],arr[i]);

        return 0;
}
```

Output

```
Array elements are
Decimal: 100, Hex: 64
Decimal: 2736, Hex: AB0
Decimal: 41120, Hex: A0A0
Decimal: 64250, Hex: FAFA
Decimal: 256, Hex: 100
```

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