

Data Types

Data Types - There are five elementary data types in C:

Type	Bit width	Range
char	8	0 to 255
int	16	-32768 to 32767
float	32	3.4E-38 to 3.4E+38
double	64	1.7E-308 to 1.7E+308
void	0	valueless

Modifiers - is used to alter the meaning of the base type to fit the need of various situations more precisely.

Keywords - in c are reserved words that have a special meaning. Reserved words are words “reserved by the programming language for expressing various statements and constructs, thus, these may not be redefined by the programmer

List of 32 Keywords/Reserved words as defined by the ANSI standard

Auto	double	int	struct
Break	else	long	switch
Case	enum	register	typedef
Char	extern	return	union
Const	float	short	unsigned
Continue	for	signed	void
Default	goto	sizeof	volatile
do	if	static	while

Data Types and Expression

Syntax Type	Syntax Memory	Syntax Size Range	Syntax Precision
Short (Also called Short Int)	2 bytes	-32,767 to 32,767	(not Applicable)
Int	4 bytes	-2,147,486,647 to 2,147,486,647	(not Applicable)
long (also called Long int)	4 bytes	-2,147,483,647 to 2,147,486,647	(not applicable)
Float	4 bytes	approximately 10^{-38} to 10^{4932}	7 digits
Double	8 bytes	approximately 10^{-308} to 10^{308}	15 digits
Long double	10 bytes	approximately 10^{-4932} to 10^{4932}	19 digits

The Type char

Can hold any single character on the keyboard

The Type Bool

Boolean after the English Mathematician George Boole who formulated rules for mathematical logic Boolean expressions evaluate to one of the two values, true or false. Boolean expressions are used in branching and looping statements.

Type Compatibilities

As a general rule, you cannot store a value of one type in variable of another type.

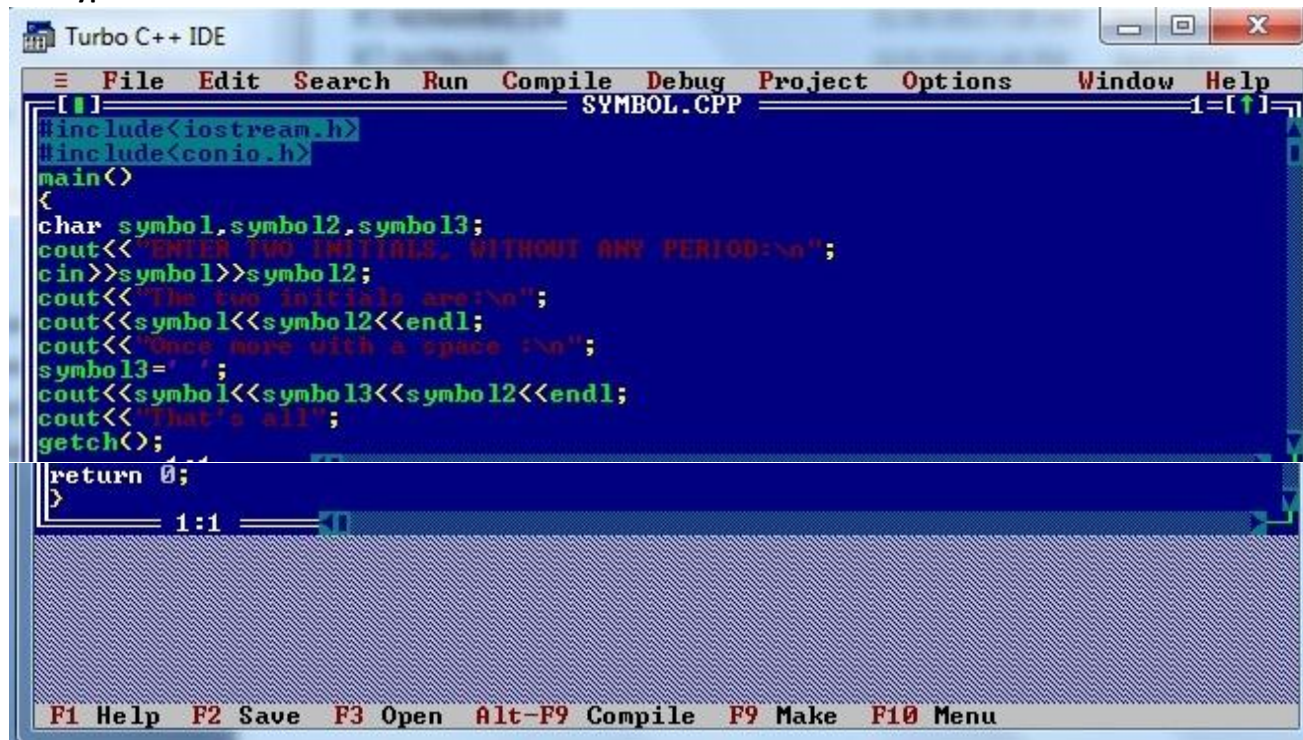
```
Int int_variable;
```

```
Int_variable=2.99;
```

```
#include<iostream.h>
```

```
#include<conio.h>
```

The Type char

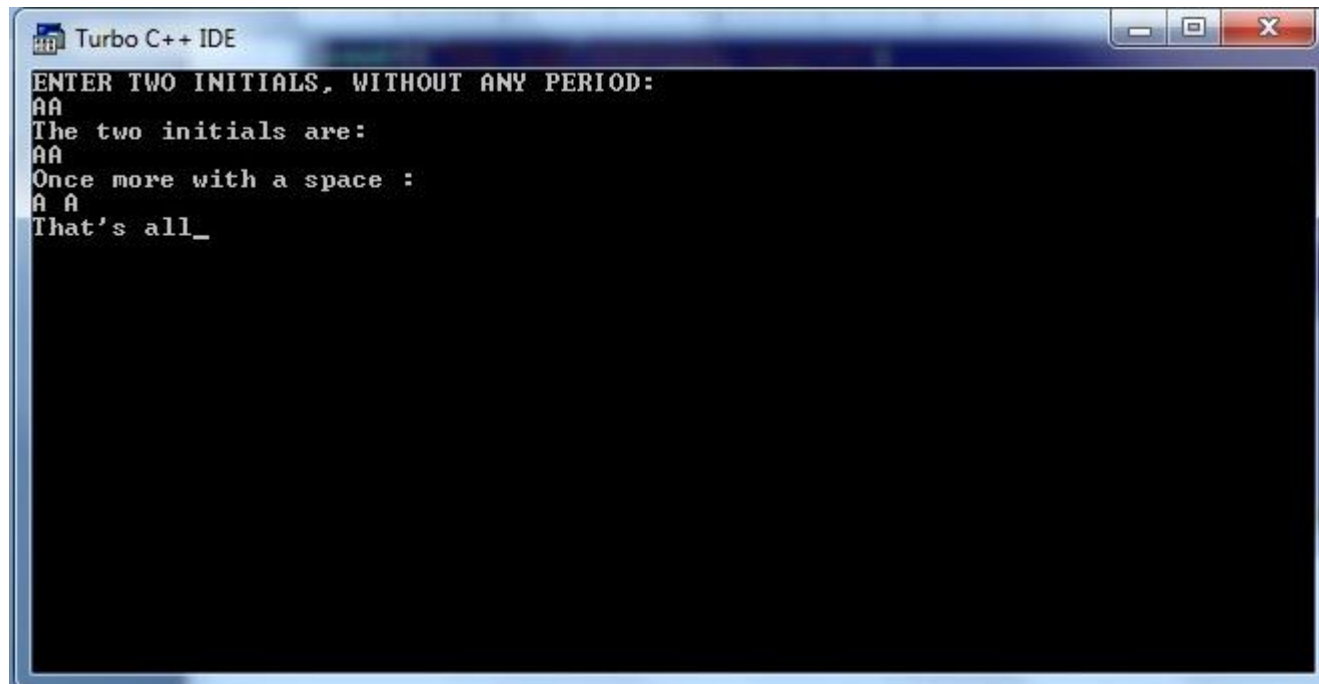


```
Turbo C++ IDE
File Edit Search Run Compile Debug Project Options Window Help
SYMBOL.CPP
#include<iostream.h>
#include<conio.h>
main()
{
char symbol1,symbol2,symbol3;
cout<<"ENTER TWO INITIALS, WITHOUT ANY PERIOD:\n";
cin>>symbol1>>symbol2;
cout<<"The two initials are:\n";
cout<<symbol1<<symbol2<<endl;
cout<<"Once more with a space :\n";
symbol3=' ';
cout<<symbol1<<symbol3<<symbol2<<endl;
cout<<"That's all";
getch();

return 0;
}
```

F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu

OUTPUT



```
Turbo C++ IDE
ENTER TWO INITIALS, WITHOUT ANY PERIOD:
AA
The two initials are:
AA
Once more with a space :
A A
That's all_
```

The problem is type mismatch. The constant 2.99 is of type double and the variable int_variable is of type int. Unfortunately, not all compilers will react the way to the above assignment statement.

Arithmetic Expression

Mathematical Formula	C++ Expression
$b^2 - 4ac$	$b*b - 4*a*c$
$x = (y + z)$	$x = (y + z)$
$\frac{1}{x^2 + x + 3}$	$1 / (x*x + x + 3)$
$\frac{a+b}{c-d}$	$(a+b) / (c-d)$