Type Casting and Type Conversion

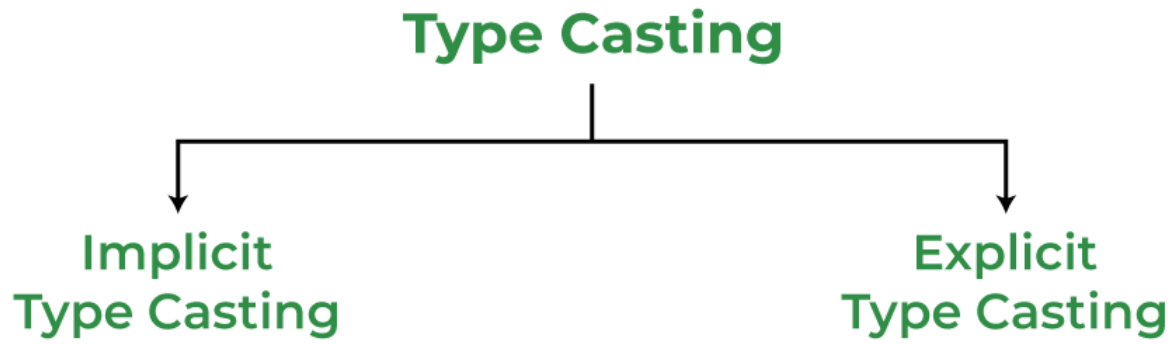
Type Casting:
In typing casting, a data type is converted into another data type by the programmer using the casting operator during the program design. In typing casting, the destination data type may be smaller than the source data type when converting the data type to another data type, that's why it is also called narrowing conversion.
Syntax/Declaration:-

destination_datatype = (target_datatype)variable;

Type conversion :
In type conversion, a data type is automatically converted into another data type by a compiler at the compiler time. In type conversion, the destination data type cannot be smaller than the source data type, that's why it is also called widening conversion. One more important thing is that it can only be applied to compatible data types.

Types of Type Casting in C
In C there are two major types to perform type casting.

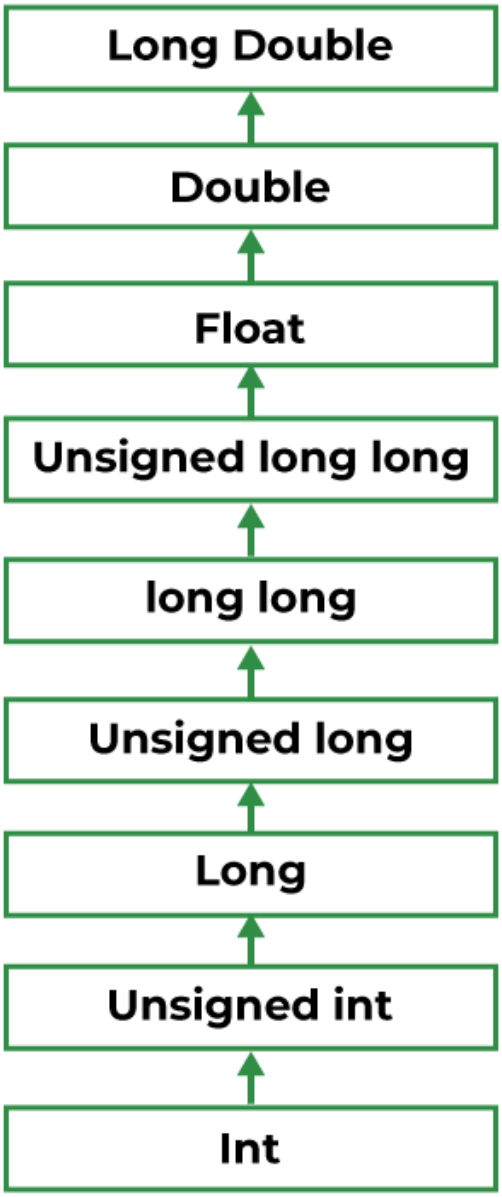
Types of Type Casting in C



Implicit Type Casting

Implicit type casting in C is used to convert the data type of any variable without using the actual value that the variable holds. It performs the conversions without altering any of the values which are stored in the data variable. Conversion of lower data type to higher data type will occur automatically.

Integer promotion will be performed first by the compiler. After that, it will determine whether two of the operands have different data types. Using the hierarchy below, the conversion would appear as follows if they both have varied data types:



Explicit Type Casting

There are some cases where if the datatype remains unchanged, it can give incorrect output. In such cases, typecasting can help to get the correct output and reduce the time of compilation. In explicit type casting, we have to force the conversion between data types. This type of casting is explicitly defined within the program.

Example 1

```
// C program to illustrate the use of
// typecasting
#include <stdio.h>

// Driver Code
int main()
{
	// Given a & b
	int a = 15, b = 2;
	float div;

	// Division of a and b
	div = a / b;

	printf("The result is %f\n", div);

	return 0;
}
```

Example 2

```
// C program to showcase the use of
// typecasting
#include <stdio.h>

// Driver Code
int main()
{
	// Given a & b
	int a = 15, b = 2;
	char x = 'a';
	double div;
	// Explicit Typecasting in double
	div = (double)a / b;
	// converting x implicitly to a+3 i.e, a+3 = d
	x = x + 3;
	printf("The result of Implicit typecasting is %c\n", x);
	printf("The result of Explicit typecasting is %f", div);
	return 0;
}
```