# C Identifiers

"Identifiers" or "symbols" are the names you supply for variables, types, functions, and labels in your program. Identifier names must differ in spelling and case from any keywords

**Types of identifiers**

- Internal identifier
- External identifier

**Internal Identifier**

- If the identifier is not used in the external linkage, then it is known as an internal identifier. The internal identifiers can be local variables.

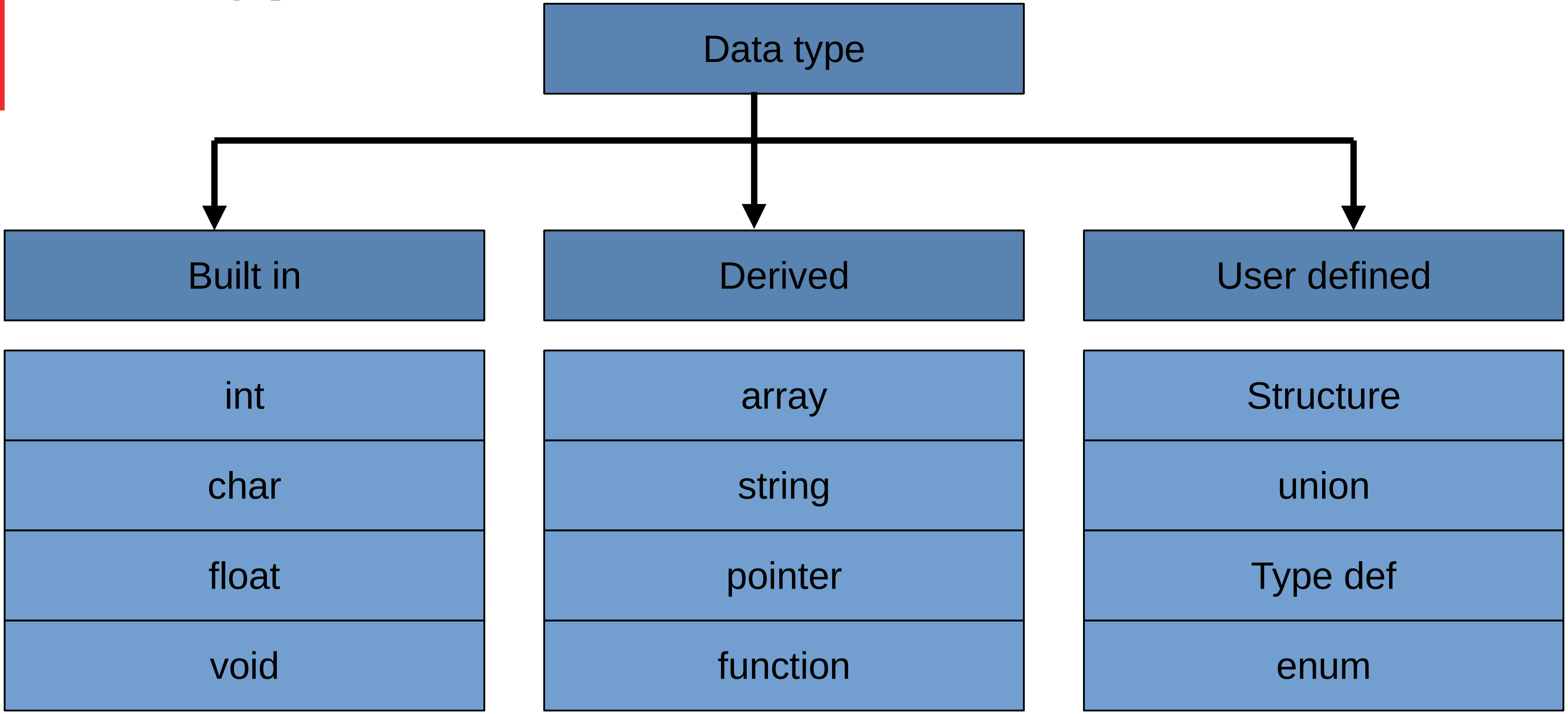
**External Identifier**

- If the identifier is used in the external linkage, then it is known as an external identifier. The external identifiers can be function names, global variables.

## Rules for constructing C identifiers

- The first character of an identifier should be either an alphabet or an underscore, and then it can be followed by any of the character, digit, or underscore.
- It should not begin with any numerical digit.
- In identifiers, both uppercase and lowercase letters are distinct. Therefore, we can say that identifiers are case sensitive.
- Commas or blank spaces cannot be specified within an identifier.
- Keywords cannot be represented as an identifier.
- The length of the identifiers should not be more than 31 characters.
- Identifiers should be written in such a way that it is meaningful, short, and easy to read

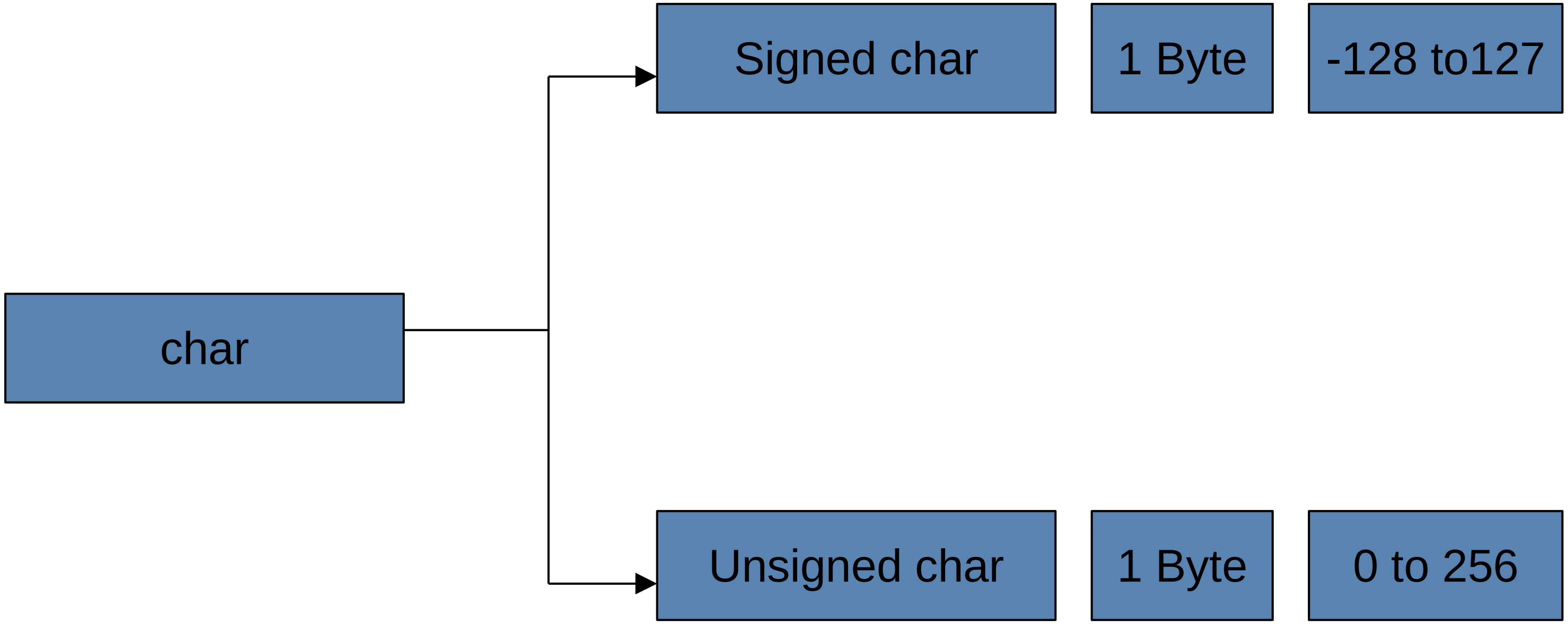
## Data types


Data type
Built in
Derived
User defined
int
char
float
void
array
string
pointer
function
Structure
union
Type def
enum

## Integer

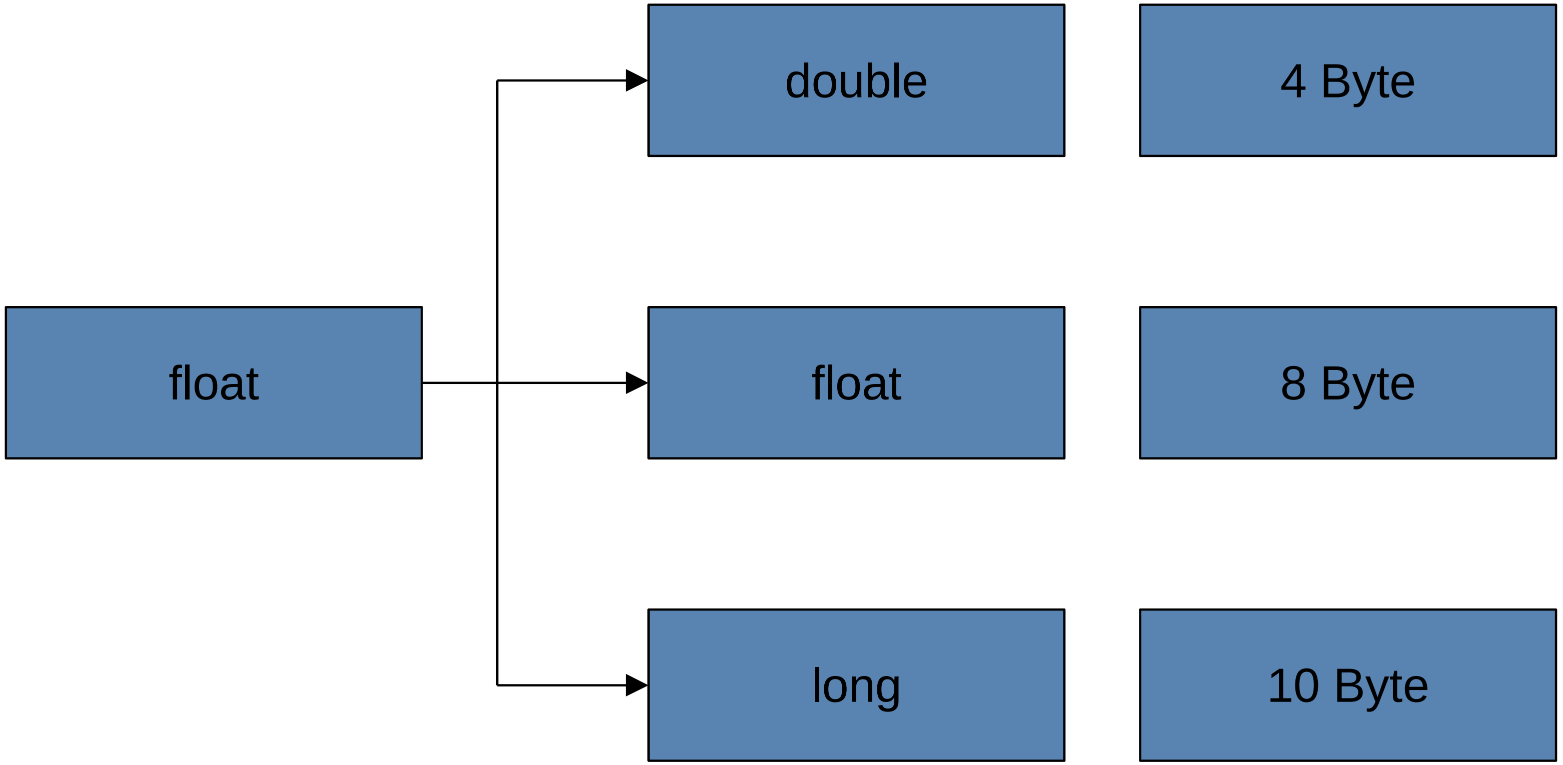
| | | | |
|---|---|---|---|
| short int | signed short int | 2 byte | -32768 to 32767 |
| | unsigned short int | 2 byte | 0 to 65535 |
| int | signed int | 4 byte | -2147483648 to 2147483647 |
| | unsigned int | 4 byte | 0 to 4294967296 |
| long int | signed long int | 8 byte | -ve 0 +ve |
| | unsigned long int | 8 byte | 0 +ve |
| long long int | signed long long int | 10 byte | -ve 0 +ve |
| | unsigned long long int | 10 byte | 0 +ve |

# char



char
Signed char
1 Byte
-128 to127
Unsigned char
1 Byte
0 to 256

## Float



## Format specifiers

The format specifier is used during input and output. It is a way to tell the compiler what type of data is in a variable during taking input using scanf() or printing using printf(). Some examples are %c, %d, %f, etc.

**The printf() is a library function to send formatted output to the screen. The function prints the string inside quotations**

```
printf("format string",argument_list);
```

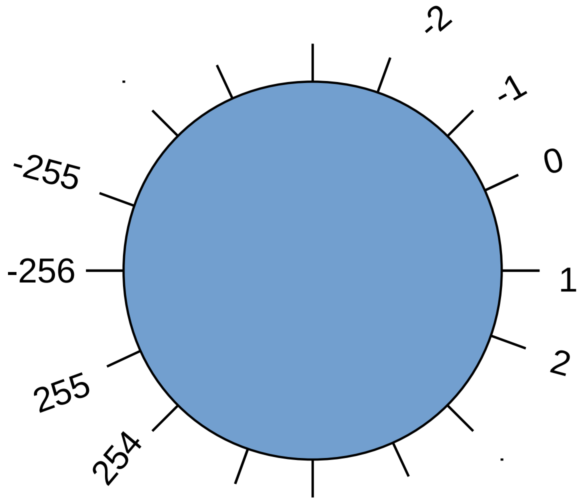
**The scanf() function is used for input. It reads the input data from the console**

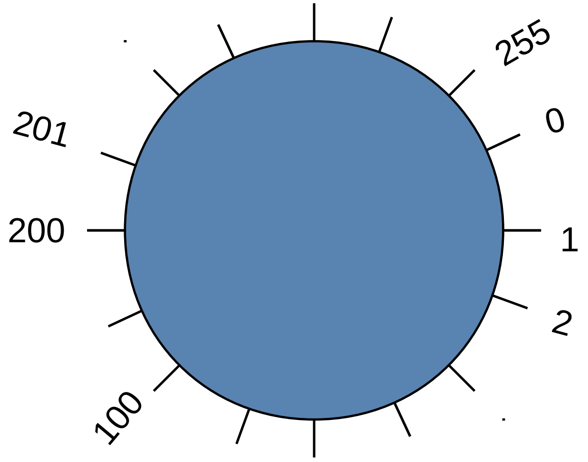
```
scanf("format string",argument_list);
```

| | |
|---|---|
| %d | int/signed int |
| %c | char |
| %f | float |
| %lf | double |
| %Lf | long double |
| %s | string |
| %u | unsigned int |
| %li | long int |
| %lli | long long  int |
| %lu | unsigned long int |

| | |
|---|---|
| %llu | unsigned long long int |
| %hi | short int |
| %hu | Unsigned short |
| %x%p | Pointer/address |
| %e | scientific notation |
| %o | octal |
| %x | Hexadecimals |

## Relation between Format specifiers &Data type





Signed char

unsigned char

## Operators in c

### Arithmetic operators

| | |
|---|---|
| Addition operator | (+) |
| Subtraction operator | (-) |
| Division operator | (/) |
| Multiplication operator | (*) |
| Modular operator | (%) |

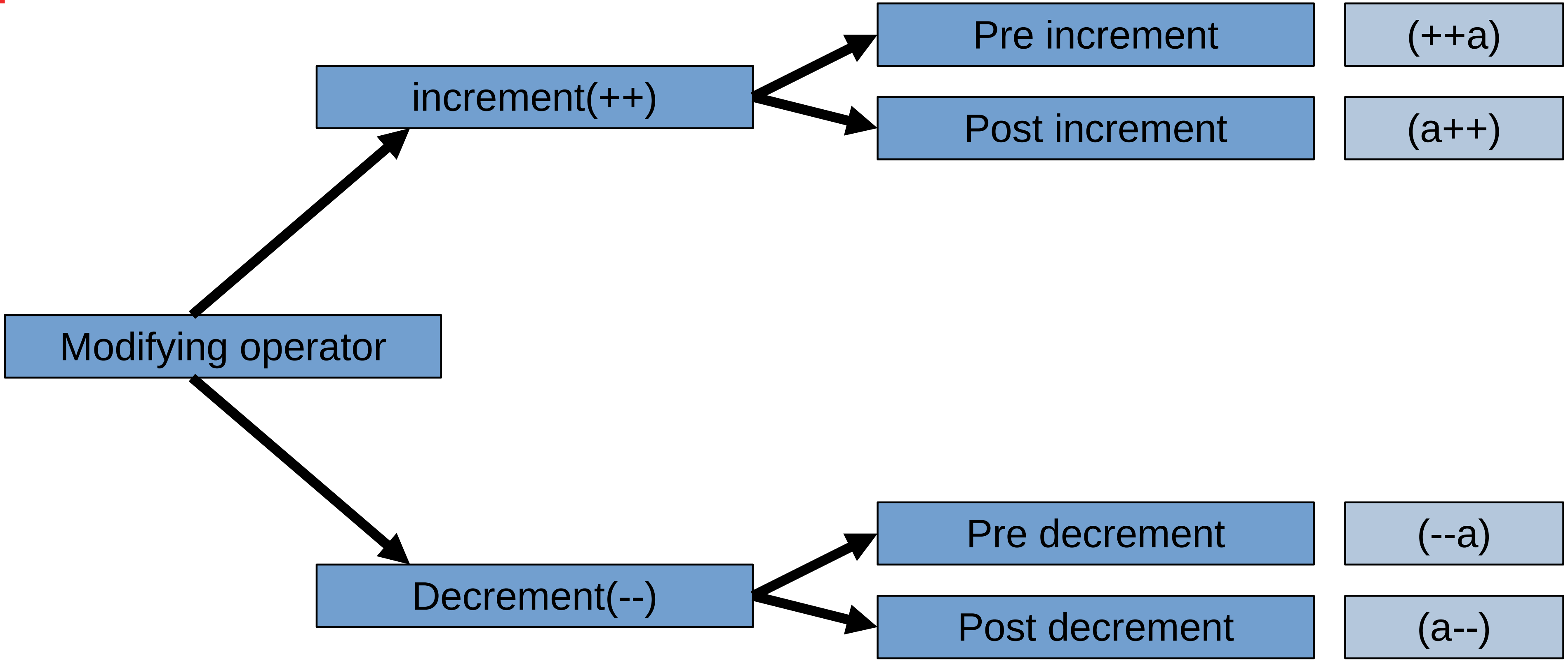
## Relation operators

| | |
|---|---|
| equal to | (==) |
| greater than or equal to | (>=) |
| greater than | (>) |
| less than or equal to | (<=) |
| less than | (<) |
| not equal to | (!=) |

## Assignment operators

| | |
|---|---|
| Simple assignment | (=) |
| Multiplication assignment | (*=) |
| Division assignment | (/=) |
| Remainder assignment | (%=) |
| Addition assignment | (+=) |
| Subtraction assignment | (-=) |
| Left-shift assignment | (<<=) |
| Right-shift assignment | (>>=) |
| Bitwise-AND assignment | (&=) |
| Bitwise-exclusive-OR assignment | (^=) |
| Bitwise-inclusive-OR assignment | (\|=) |

## Modifying operator



- Arithmetic operators are Unary operators

## logical operators

| | | |
|---|---|---|
| AND | (&&) | True only if both operands are true |
| OR | (\|\|) | True if either operand is true |
| NOT | (~) | Changes true to false and false to true |

## Bitwise operators

| | |
|---|---|
| (&) | Bitwise AND operator |
| (\|) | Bitwise OR operator |
| (^) | Bitwise exclusive OR operator |
| (~) | One's complement operator (unary operator) |
| (<<) | Left shift operator |
| (>>) | Right shift operator |

## Comma operator

The comma sign is used for mainly two different purposes in the C language – as an operator and as a separator. Thus, its behavior is very different according to where we place/use it in a program

For example

```
int x, y, z;
```

In the statement mentioned above, the comma acts as a separator and informs the compiler that the x, y, and z variables are three different types of variables

```
p = 40, 50, 60, 70, 80, 90;

q = (40, 50, 60, 70, 80, 90);
```

In the very first statement mentioned above, the value assigned to the variable p will be equal to 40. It is because the (=) equal to assignment operator has a higher priority as compared to the (,) comma operator. Thus, the program will assign the variable x with a value of 40.

In the case of the second statement, the value of q will be equivalent to 90. It is because the values 40, 50, 60, 70, 80 and 90 are enclosed in the form of braces () and these braces have a higher priority, as compared to the equal to (=) assignment operator. Thus, when we provide the variable q with multiple values (using the comma operator and the braces), then the program will consider the right-most value as the result/output of this expression. Thus, the program variable q will be assigned with the value of 90