C++ DATA TYPES

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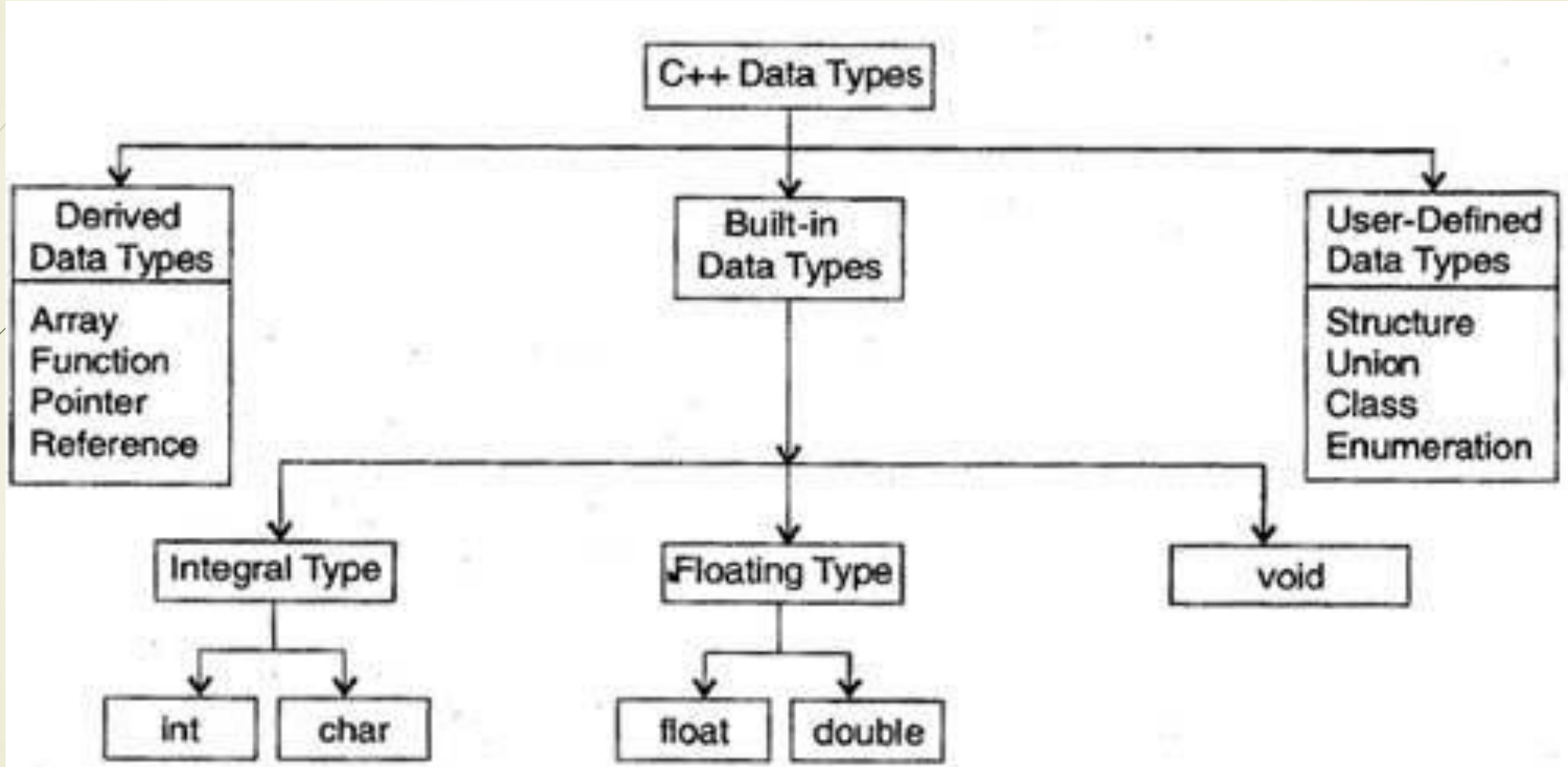
Data Types - A data type determines the type and the operations that can be performed on the data.



Various Data Types in C++

Built-In Data Types

Integral Data Type: The integral data type is used to store integers and includes char (character) and int (integer) data types.

Char:

Character Data Types

Type	Size (in bytes)	Range
char	1	-128 to 127
Signed char	1	-128 to 127
unsigned char	1	0 to 255

Built-In Data Types

Int: Numbers without the fractional part represent integer data.

Integer Data Types

Type	Size(in bytes)	Range
int	2	-32768 to 32767
signed int	2	-32768 to 32767
unsigned int	2	0 to 65535
shortint	2	-32768 to 32767
signed short int	2	-32768 to 32767
unsigned short int	2	-32768 to 32767
longint	4	-2147483648 to 2147483647
signed longint	4	-2147483648 to 2147483647
unsigned longint	4	0 to 4294967295

Built-In Data Types

Floating-point Data Type:

A floating-point data type is used to store real numbers such as 3 .28, 64. 755765, 8.01, -24.53. This data type includes float and double data types.

Floating Point Data Types

Type	Size(in bytes)	Range	Digits of Precision
float	4	$3.4 \cdot 10^{-38}$ to $3.4 \cdot 10^{38}$	7
double	8	$1.7 \cdot 10^{-308}$ to $1.7 \cdot 10^{308}$	15
long double	10	$3.4 \cdot 10^{-4932}$ to $3.4 \cdot 10^{4932}$	18

Void:

The void data type is used for specifying an empty parameter list to a function and return type for a function.

Derived Data Types

Array:

An array is a set of elements of the same data type that are referred to by the same name.

Function:

A function is a self-contained program segment that carries out a specific well-defined task.

Reference :

A reference is an alternative name for a variable.

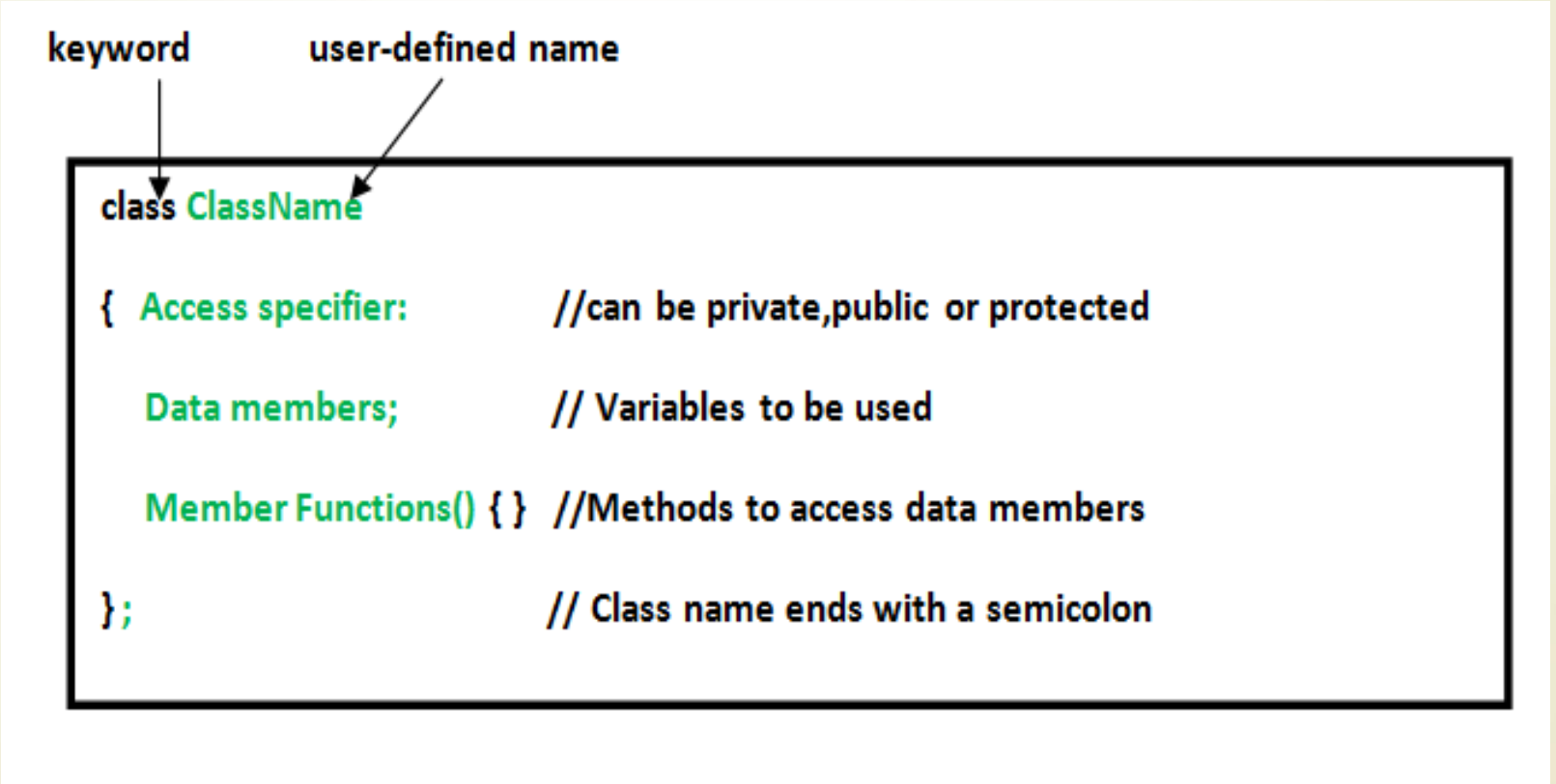
Pointer :

A pointer is a variable that can store the memory address of another variable. Pointers allow to use the memory dynamically.

User-Defined Data Types

Class:

It is a user-defined data type, which holds its own data members and member functions.



User-Defined Data Types

Structure:

A structure creates a data type that can be used to group items of possibly different types into a single type.

Example:

```
struct StudentRec
{
    string name;
    string idNum;
    float gpa;
};
```

User-Defined Data Types

Union :

A union is comprised of two or more variables that share the same memory location.

A union declaration is similar to that of a structure.

Example:

```
union utype
{
    short int i;
    char ch;
} ;
```

User-Defined Data Types

Enumeration:

An enumerated type is defined by giving a name for the type and then giving a list of labels.

Example:

```
enum Month {JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP,
            OCT, NOV, DEC};
```