

CAP444

OBJECT ORIENTED PROGRAMMING

USING C++

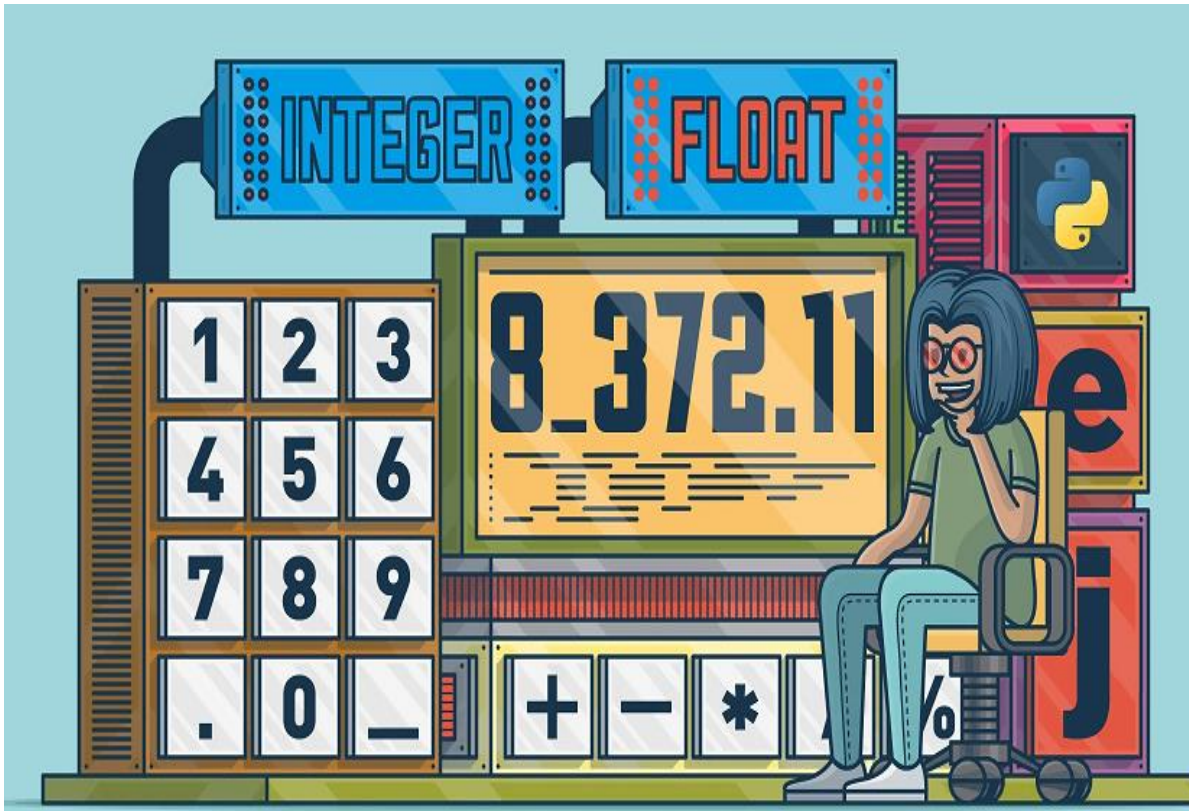
Session #1



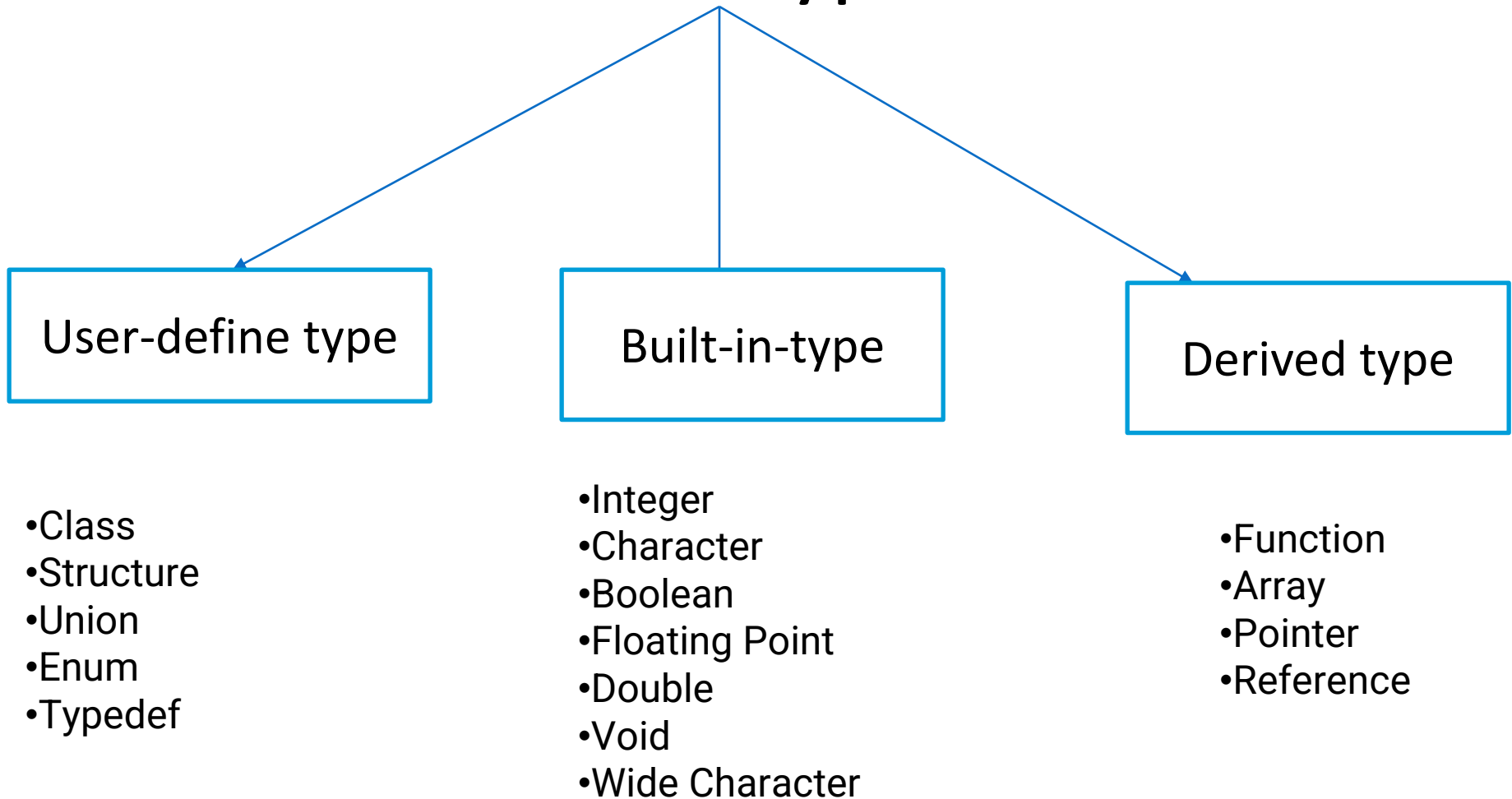
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Topics Covered...

Basic concepts of object oriented programming



Data types



Primitive Data Types: These data types are built-in or predefined data types and used to declare variables.

Primitive data types available in C++ are:

Integer(int)

Character(char)

Boolean(bool)

Floating Point(float)

Double Floating Point(double)

Valueless or Void(void)

Wide Character(wchar_t)

Wide Character: Wide character data type is also a character data type but this data type has size greater than the normal 8-bit datatype.

Derived Data Types: The data-types that are derived from the primitive or built-in datatypes are referred to as Derived Data Types.

These are:

Function

Array

Pointer

Reference

Abstract or User-Defined Data Types: These data types are defined by user itself.

Class

Structure

Union

Enumeration or Enum

Typedef

Data type	Size(in byte)	Range
char	1 =8 bits (2^8)	-128 to 127 or 0 to 255
unsigned char	1	0 to 255
signed char	1	-128 to 127
int	4=32 bits (2^{32})	-2,147,483,648 to 2,147,483,647
short int	2	-32,768 to 32,767
unsigned short int	2	0 to 65,535
unsigned int	4	0 to 4,294,967,295
float	4	
double	8	
long double	12	

We can display the size of all the data types by using the sizeof() operator

Memory representation

1 Byte= 8 Bits

128	64	32	16	8	4	2	1
0	1	0	0	0	0	0	1

$A(65)=01000001$

`char ch=65;`

Or

`char ch='A'`

Char is occupying 1 Byte memory

How to find out range?

For Signed data types:

- 1.) calculate total number of bits
- 2.) Calculate $-2^{(n-1)}$ for minimum range
- 3.) Calculate $(2^{(n-1)})-1$ for maximum range

Unsigned Data Types:

- 1.) Find number of bits
- 2.) minimum range is always zero for unsigned data type
- 3.) for maximum range calculate 2^n-1

Example:

Char : 1 byte: 8 bits=n

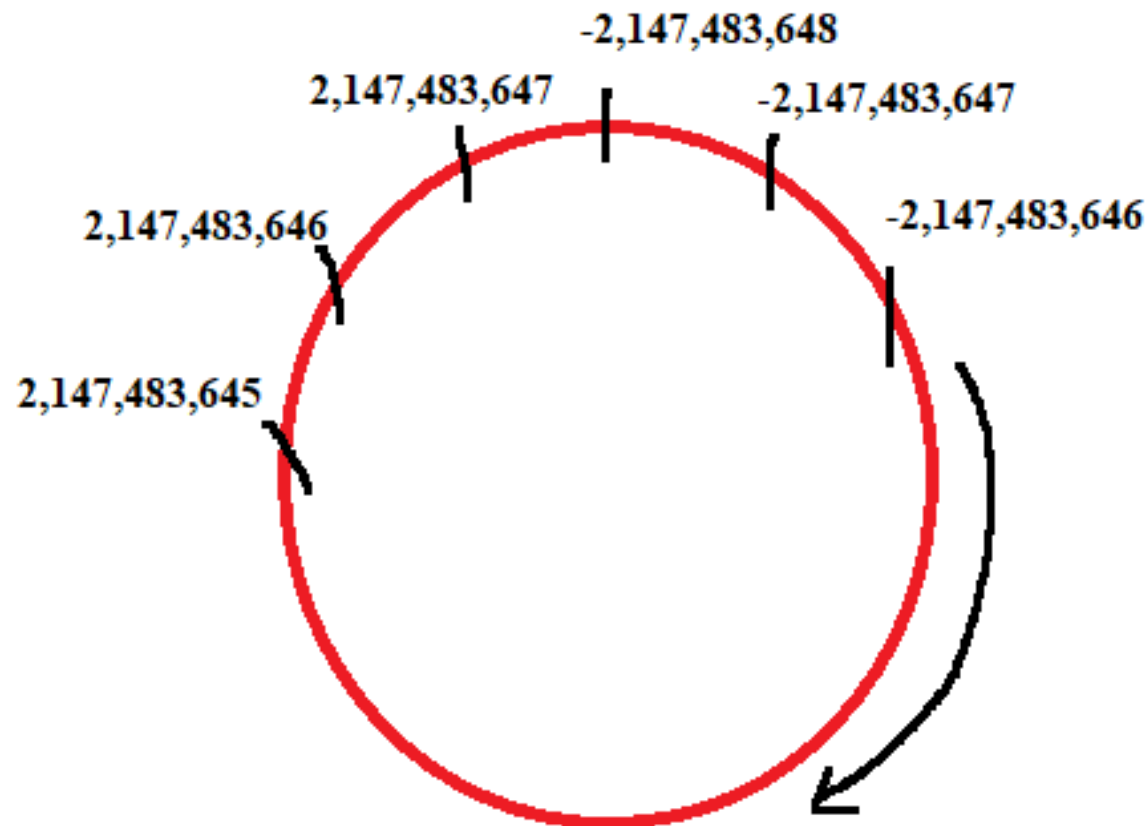
Signed: $-2^{(8-1)}$ to $(2^{(8-1)})-1$
=-128 to 127

Unsigned:

0 to $2^{(8)}-1$
=0 to 255

Exceeding range...?

integer range: -2,147,483,648 to 2,147,483,647



What will be output?

```
#include <iostream>
using namespace std;
int main()
{
    int num=2147483648;
    cout <<num<< endl;
    return 0;
}
```

- A. 2147483648
- B. - 2147483648
- C. Error
- D. None

Data type modifiers are:

- Signed
- Unsigned
- Short
- Long



Any Query?