CAP444
OBJECT ORIENTED PROGRAMMING USING C++

Unit2

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Unit-2

Operator overloading and type conversions :

- rules for operator overloading,
- overloading unary operators,
- overloading binary operators,
- overloading binary operators using friend function,
- type conversions:
  - basic to class type,
  - class to basic type,
  - one class to another class type

Operator overloading

- To specify more then one definition for an operator within the same scope.
- In C++, we can make operators to work for user defined data types.
- You can redefine built in operators except few:
    - Scope operator (::)
    - Sizeof
    - member selector(.)
    - member pointer selector(.*)
    - ternary operator(?:)

Operators which can overload

+	-	*	/	%	^
&	|	~	!	,	=
<	>	<=	>=	++	--
<<	>>	==	!=	&&	||
+=	-=	/=	%=	^=	&=
|=	*=	<<=	>>=	[]	()
->	->*	new	new []	delete	delete []

Operator Overloading Syntax:

Return_type operator operator_Symbol(parameters)

{

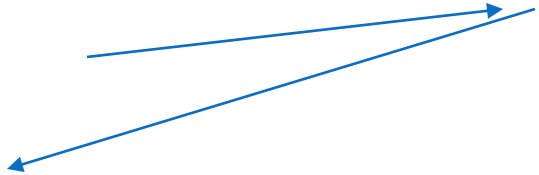
}

Why operator overloading:

class obj1,obj2,obj3 Replace to

obj3=obj1.add(obj2)

obj3=obj1+obj2//



- Unary operators operate on only one operand

Ex:

i++

- Binary operators work on two operands

Ex:

+

Which of the following operator cannot be overloaded?

a) +

b) ?:

c) –

d) %

What is a binary operator?

a) Operator that performs its action on a single operand

b) Operator that performs its action on two operand

c) Operator that performs its action on three operand

d) Operator that performs its action on any number of operands

Operator overloading for Unary operators:

The unary operators operate on a single operand :

- The increment (++) and decrement (--) operators.
- The unary minus (-) operator.
- The logical not (!) operator.

Q:-Create a Class for Box and find the volume of Box using Binary + operator overloading concept.

Hint:

```
class Box {
   double length;     // Length of a box
   double breadth;    // Breadth of a box
   double height;     // Height of a box
}
```

Q:- Write a program to implement Binary operator.

Hint:

Binary (+)

Go through: cplusplus/Example of Binary(+) operator overloading.pdf at master · vishalamc/cplusplus (github.com)

Write a program to overload multiplication operator (*) using friend function to multiply two matrices.

Q:- Write a program to implement Unary operator.

Go through: cplusplus/Example of Unary operator overloading.pdf at master · vishalamc/cplusplus (github.com)

Overloading binary operators using friend function

Friend function takes two parameters in case when we want to overload binary operators using friend function

Ex:

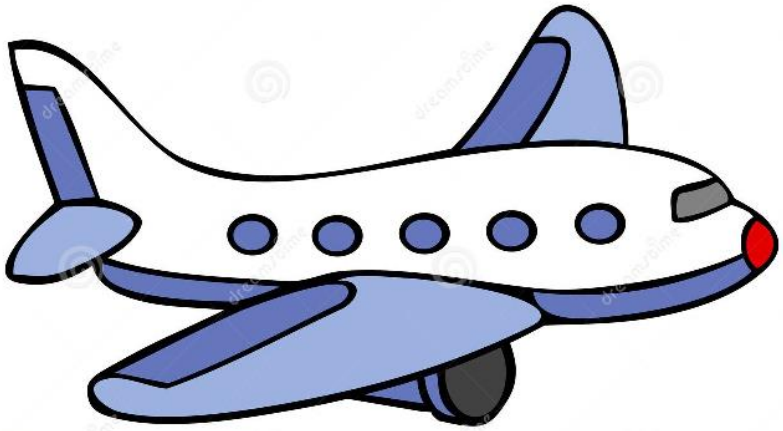
friend A operator +(A &x, A &y);

Example:

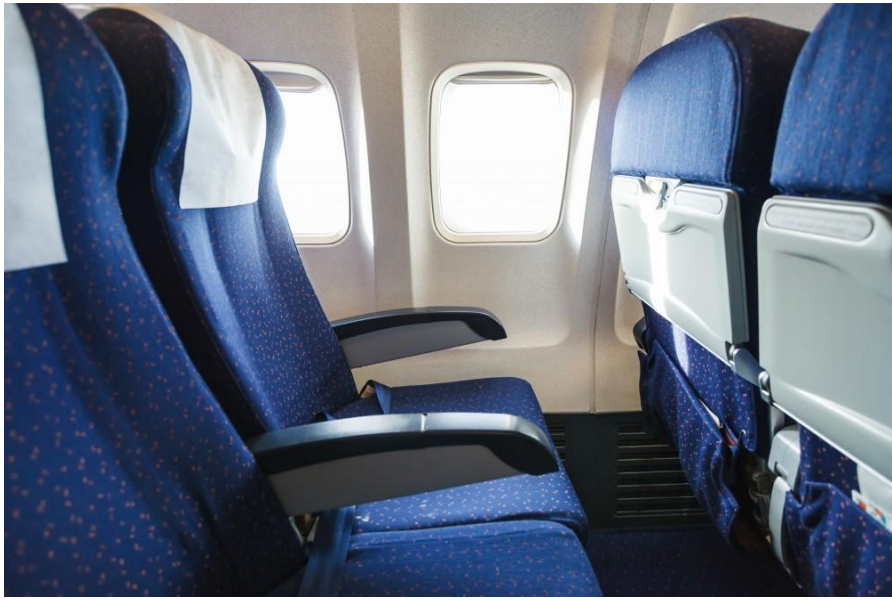
Go through:

Situation??

Real Life example



Business Class



Economy Class

Type Conversion

- Basic data types conversion done automatic by compiler
- User define data type conversion not done automatically
- User define data type conversion done by using either constructor or by using casting operator

Three type of situation occurs during user define type conversion:

- 1. basic type to class type(using constructor)
- 2. class type to basic type(using casting operator function)
- 3. class type to class type (using constructor and casting operator function both)

basic type to class type(using constructor)

- Basic type to class type achieved by using constructor.

```
class A
{};
A a1;
int  x;
a1=x //basic to class type
```

Go through:

What will be output?

```
#include <iostream>
    using namespace std;
    int main()
    {
        double a = 21.09399;
        float b = 10.20;
        int c ;
        c = a;
        cout << c ;
        c = b;
        cout << c ;
        return 0;
    }
```

A) 2110
B) 1210
C) 21
D) 121

class type to basic type(using casting operator function)

Class type to basic type done by using casting operator function

1. It must be a define inside in class.
2. It must not specify a return type in function signature.
3. It must not have any arguments.

```
class A
{};
A a1;
int  x;
x=a1 //class type to basic type
```

Go through: cplusplus/Class to basic type conversionEx.pdf at master · vishalamc/cplusplus (github.com)

Syntax:

```
operator dest_typename()
{
  return type;
}
```

```
class A
{};
A a1;
int  x;
x=a1 //class type to basic type
```

class type to class type (using constructor and casting operator function both)

Ex: A obj1; B obj2;

obj1 = obj2 ; // obj1 and obj2 are objects of different classes

- First approach using Constructor:-

Left side of assignment operator(=) which is class object we have to create constructor in that class here in Class A.

- Second approach using casting operator function:

Right side of assignment operator(=) which is class object we have to create casting operator function in that class here class B.

Go through: cplusplus/Class to Class type conversionUsinCastingOperatorFunction.pdf at master · vishalamc/cplusplus (github.com)

What is the return type of the casting operator function?

a) void

b) int

c) float

d) no return type

Which conversion is not possible?

A. int to float

B. float to int

C. char to float

D. All are possible

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Any Query?

Unit-2 End