Experiment No. 7

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Aim: Write a C++ program to implement the concept of "this" keyword & Friend class.

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Theory: The "this" keyword in C++ is a special pointer that points to the current instance of a class. It is avaliable within all non--static member function of a class. In C++, when a member function is called, it is implicitly receives a pointer to the object it is called on, & this pointer is represented by "this".

Key Characteristics of the "this" Keyword:

i> Pointer to current Object: "this" is a pointer to the current instance of the class.

ii> Type: *) Non-const member function: "this" is a type of "classname"

*) Const member function: "this" is the type "const classname".

iii> Access Members: Used to access class members, especially when local variables or parameters ~~shadow sh~~ shadow the member names.

iv) Function Chaining : The "this" keyword pointer can return "*this" (dereferenced pointer) to allow chaining of member function calls.

v) Non-static Methods only : Available only in the non-static member functions, as static functions don't belong to an instance.

vi) Immutable : The "this" pointer itself cannot be modified to point to another object.

Code: // C++ code to demonstrate the use of "this" keyword :

```
#include<iostream>
using namespace std;

class Box {
        private:
                int length;
        public:
                Box (int length) {
                                this -> length = length;
                }
        bool isEqual(Box &b) {
                        return this -> length == b.length;
        }
void printlength() {
            cout << "Length :" << this -> length
                          << endl;
    }
  };

int main () {
      Box box1(10);
      Box box2(10);

      box1.printLength();
     box2.printLength();

      if (box1.isEqual (box2)) {
            cout << "Boxes are equal"
                          << endl;
      }else {
            cout << "Boxes are NOT equal"
                    << endl;
      }

        return 0;
}
```

Output:

```
Length : 10
Length : 10
Boxes are equal.
```

Theory: In C++, a class is a user defined data type that serves as a blueprint for creating Objects.
Classes are made up of data members & member functions.

A Friend class is a class that has a allowed access to the private and protected members of another class. Typically, only member functions and friend functions have access to a class's private data, but by declaring another class as a friend, user can grant it this access.

This feature of friend class is useful when user want certain classes to work closely & together without exposing the private data to other classes & Typically only member functions & friend functions have access to a Class's private data to other classes.

Key Characteristics of ~~private~~ friend Class:
i) Access to Private members.
ii) Declared inside the class.
iii) Friend class can't be reciprocaled

iv) Friend class is NOT inherited

v) Used to implement tight collaboration.

Syntax:
```
Class classB ; // Forward Declaration.

class classA {
        friend class classB; // class B is a friend of
        private:                        // classA
                int secretdata;
        };
```

Code:
```
#include <iostream>
Using namespace std;

Class Box ;

class Display {
        public:
                void showLength(Box &b);
};

class Box {
        private:
                int length;
                friend class Display;
```

Conclusion: Hence the programs & concepts eelated to the "this" keyword & friend class have been studied and examined successfully.

```
public :
        Box (int l) : length (l) {}
};

void Display :: ShowLength (Box &b) {
        cout << "Length of the Box :"
             << b.length << endl;
}

int main () {
    Box b(15);
    Display d;
    d.showLength(b);

    return 0;
}
```

Output :

```
Length of the box : 15
```

Conclusion: Hence the programs & concepts related to the "this" keyword & friend class have been studied & examined successfully.