Object Oriented Programming

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chapter 10

Outline

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- using the *this* pointer

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- *static* class members

using the this *pointer*

This pointer

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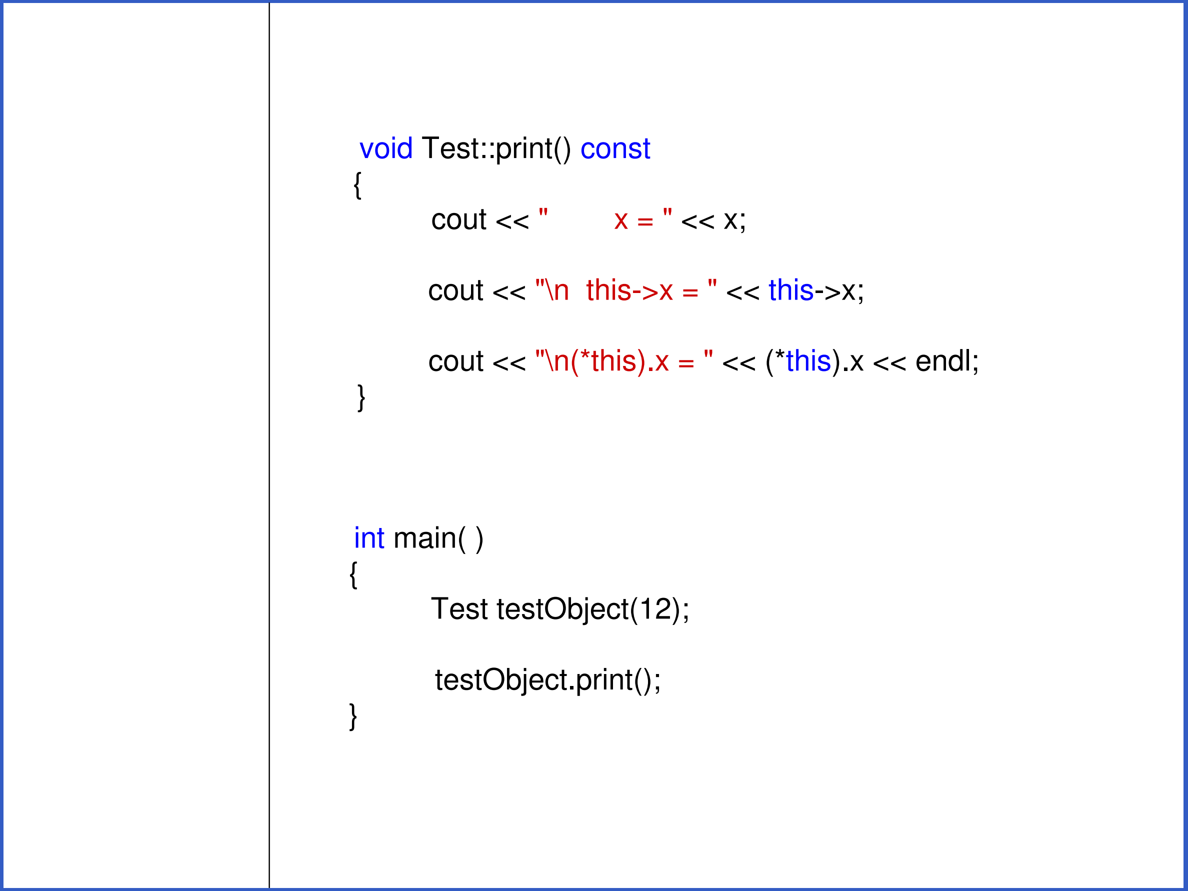
Question. An object’s member functions can manipulate the object’s data. How do member functions know which object’s data members to manipulate?

Answer. Every object has access to its own address through a pointer called *this* (a C++ keyword).

This pointer

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


class Test
{
public:
      Test (int = 0);
      void print () const;

private:
      int x;
};


Test::Test( int value )
              : x(value)
{

}
```

This pointer



```
void Test::print() const
{
        cout << "        x = " << x;

        cout << "\n  this->x = " << this->x;

        cout << "\n(*this).x = " << (*this).x << endl;
}



int main( )
{
        Test testObject(12);

        testObject.print();
}
```

static **class members**

Static members

Fact. Generally, each object of a class has its own copy of all the data members of the class. However, in certain cases, only one copy of a variable should be shared by all objects of a class. A static data member is used for these and other reasons.

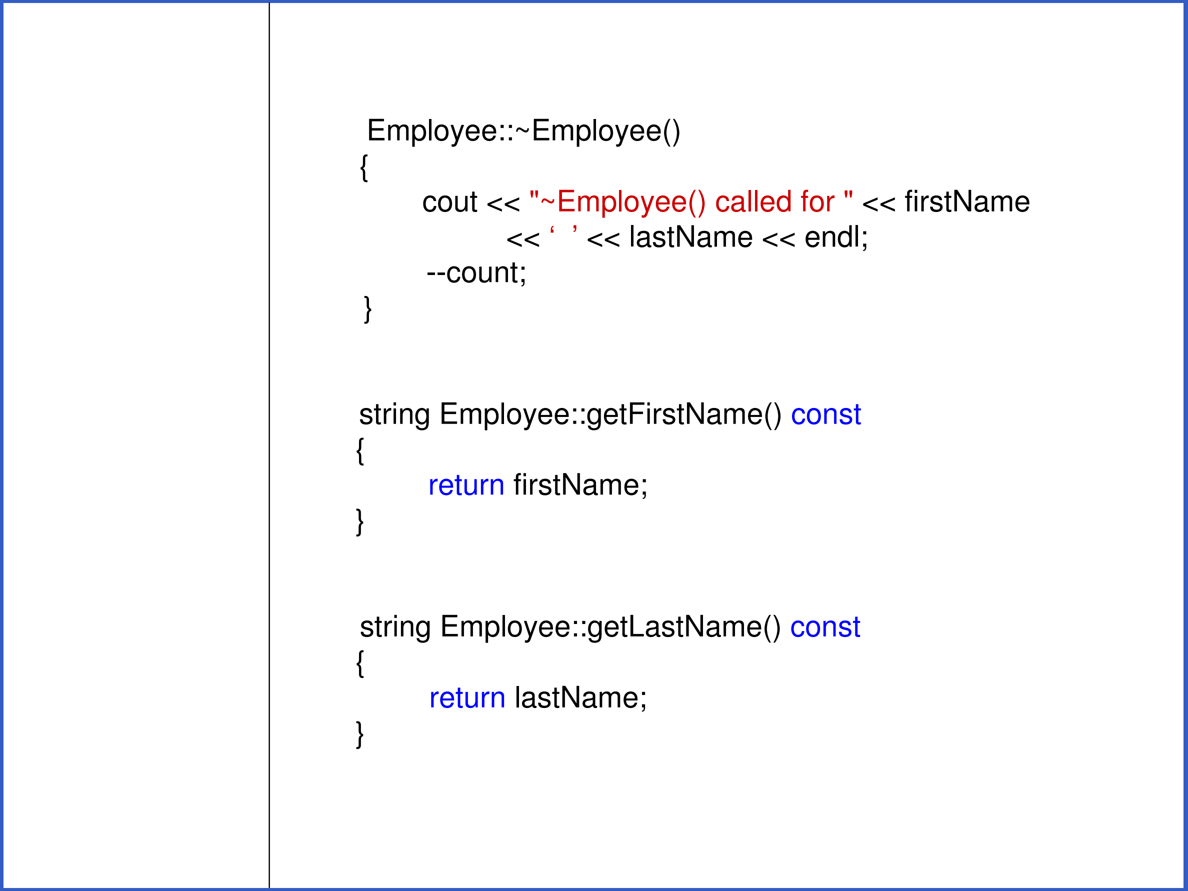
static members

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

class Employee
{
 public:
      Employee(const string &, const string &);
      ~Employee();
      string getFirstName() const;
      string getLastName() const;

      static int getCount();

 private:
      string firstName;
      string lastName;


      static int count;
};
```

static members

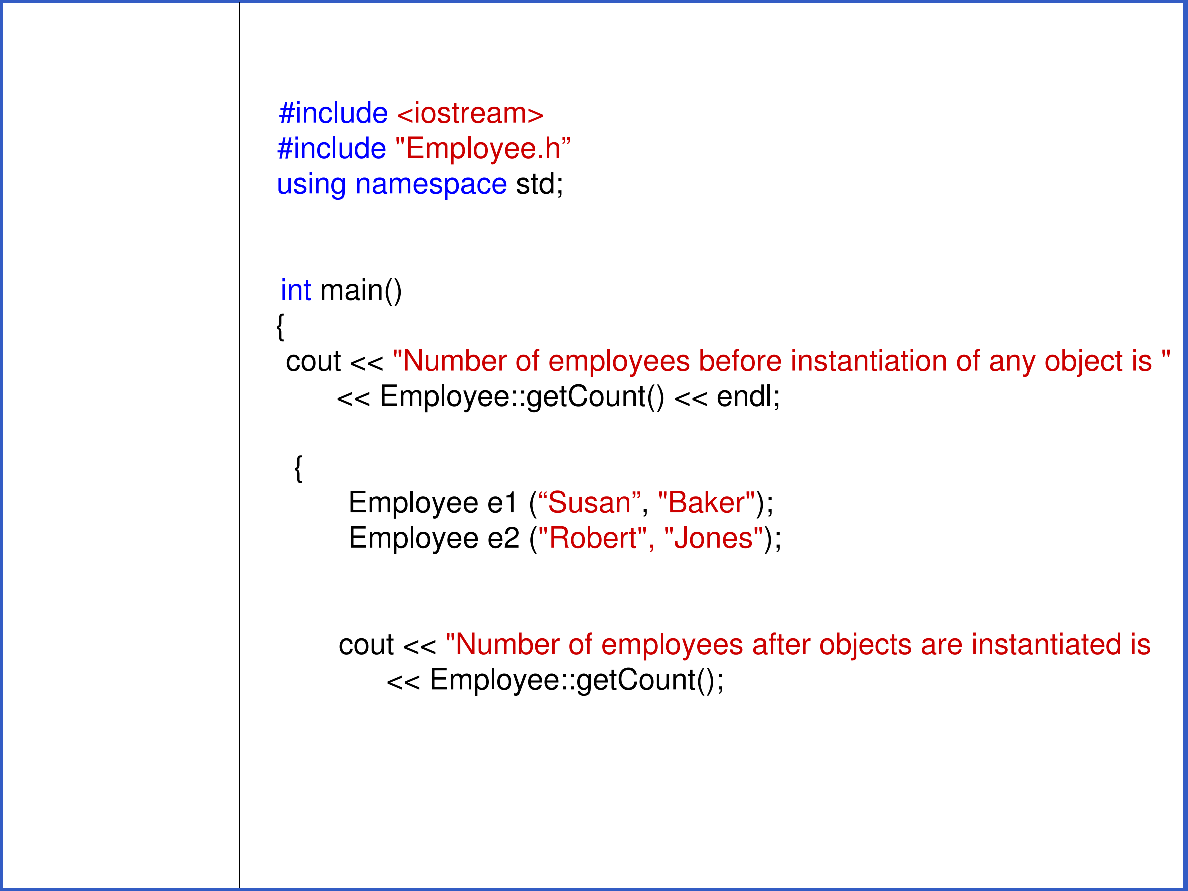
```
#include <iostream>
#include "Employee.h"
using namespace std;

int Employee::count = 0;      //cannot include keyword static

int Employee::getCount()
{
        return count;
}


Employee::Employee(const string &first, const string &last)
        : firstName(first), lastName(last)
{
        ++count;
        cout << "Employee constructor for " << firstName
          << ' ' << lastName << " called." << endl;
}
```

static members



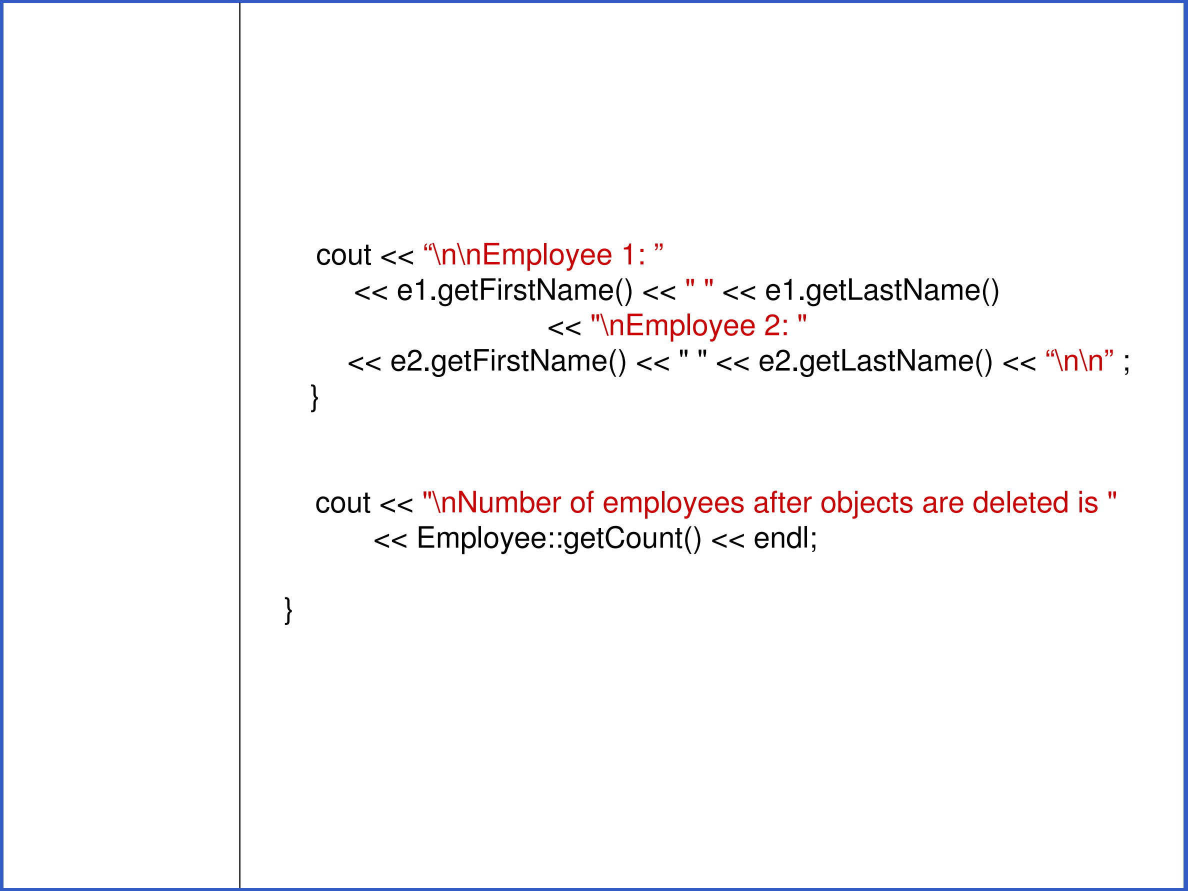
```
Employee::~Employee()
{
        cout << "~Employee() called for " << firstName
                << ' ' << lastName << endl;
        --count;
}


string Employee::getFirstName() const
{
        return firstName;
}


string Employee::getLastName() const
{
        return lastName;
}
```

static members



```
#include <iostream>
#include "Employee.h”
using namespace std;


int main()
{
 cout << "Number of employees before instantiation of any object is "
      << Employee::getCount() << endl;

  {
       Employee e1 (“Susan”, "Baker");
       Employee e2 ("Robert", "Jones");


      cout << "Number of employees after objects are instantiated is
           << Employee::getCount();
```

static members



```
    cout << "\n\nEmployee 1: "
        << e1.getFirstName() << " " << e1.getLastName()
                              << "\nEmployee 2: "
        << e2.getFirstName() << " " << e2.getLastName() << "\n\n" ;
   }


   cout << "\nNumber of employees after objects are deleted is "
         << Employee::getCount() << endl;

}
```

Homework:

- Read Sec. 10.2, 10.4, 10.5, 10.6.