CSE1121: Structured & OOP Language

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What is OOP?

- OOP is a powerful way to approach the task of programming.
- OOP encourages developers to decompose a problem into its constituent parts.
- *Each component becomes a self-contained object that contains its own instructions and data that relate to that object.*
- So, complexity is reduced and the programmer can manage larger programs.

What is OOP? (cont.)

- All OOP languages, including C++, share three common defining traits:
  - Encapsulation
    - Binds together code and data
  - Polymorphism
    - Allows one interface, multiple methods
  - Inheritance
    - Provides hierarchical classification
    - Permits reuse of common code and data

C++ Program Structure

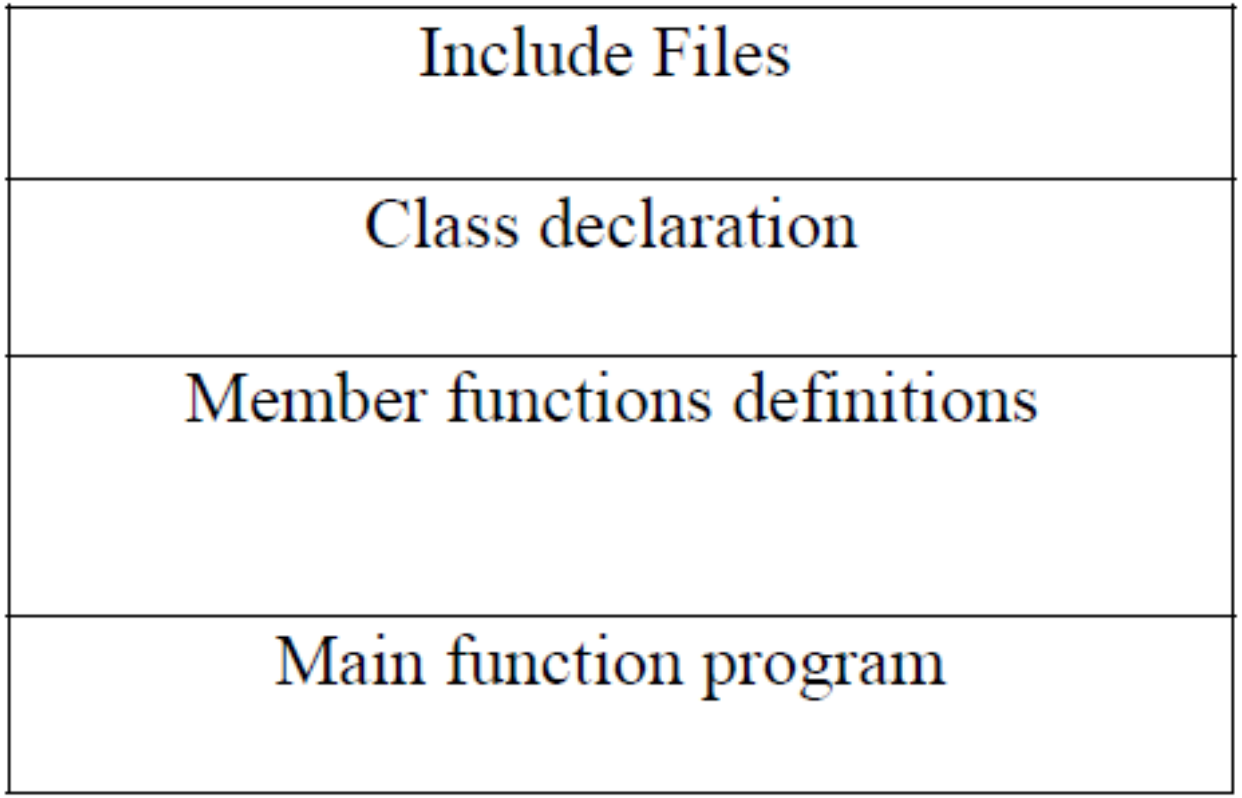


Fig : Structure of a C++ program

Classes: A First Look

- A class declaration is a logical abstraction that defines a new type.
- It determines what an object of that type will look like.
- An object declaration creates a physical entity of that type.
- That is, an object occupies memory space, but a type definition does not.
- **Example:** p-23.cpp, p-26.cpp, stack-test.c

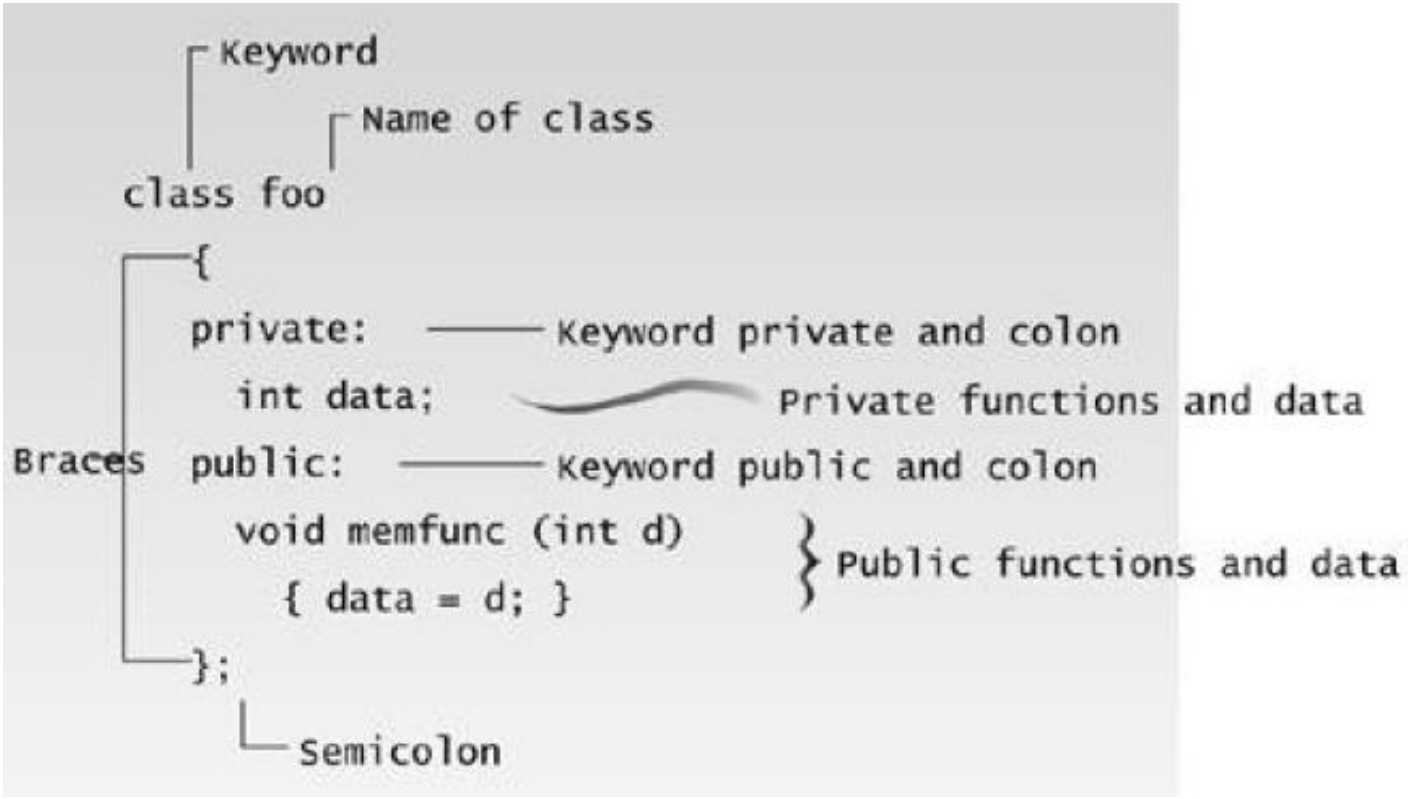
Classes: A First Look

- General syntax -

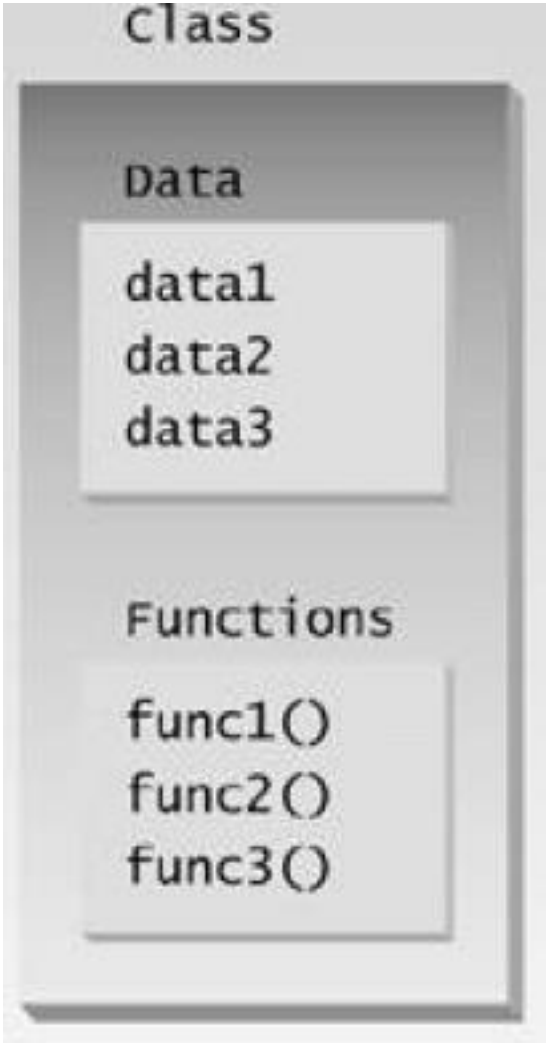
```
class class-name
{
        // private functions and variables
public:

        // public functions and variables
}  object-list (optional);
```

Syntax of a class specifier



Classes contain data and functions.



Simple your first OOP

```
class smallobj {      //declare a class
 private:
        int somedata;     //class data
public:
       void setdata(int d)       //member function to set data
              { somedata = d; }
      void showdata()         //member function to display data
              { cout << "\nData is " << somedata; }
};
int main( ){
   smallobj s1, s2;
   s1.setdata(1066);
   s2.setdata(1776);
    s1.showdata();
   s2.showdata();
   return 0;
}
```

Two objects of class smallobj

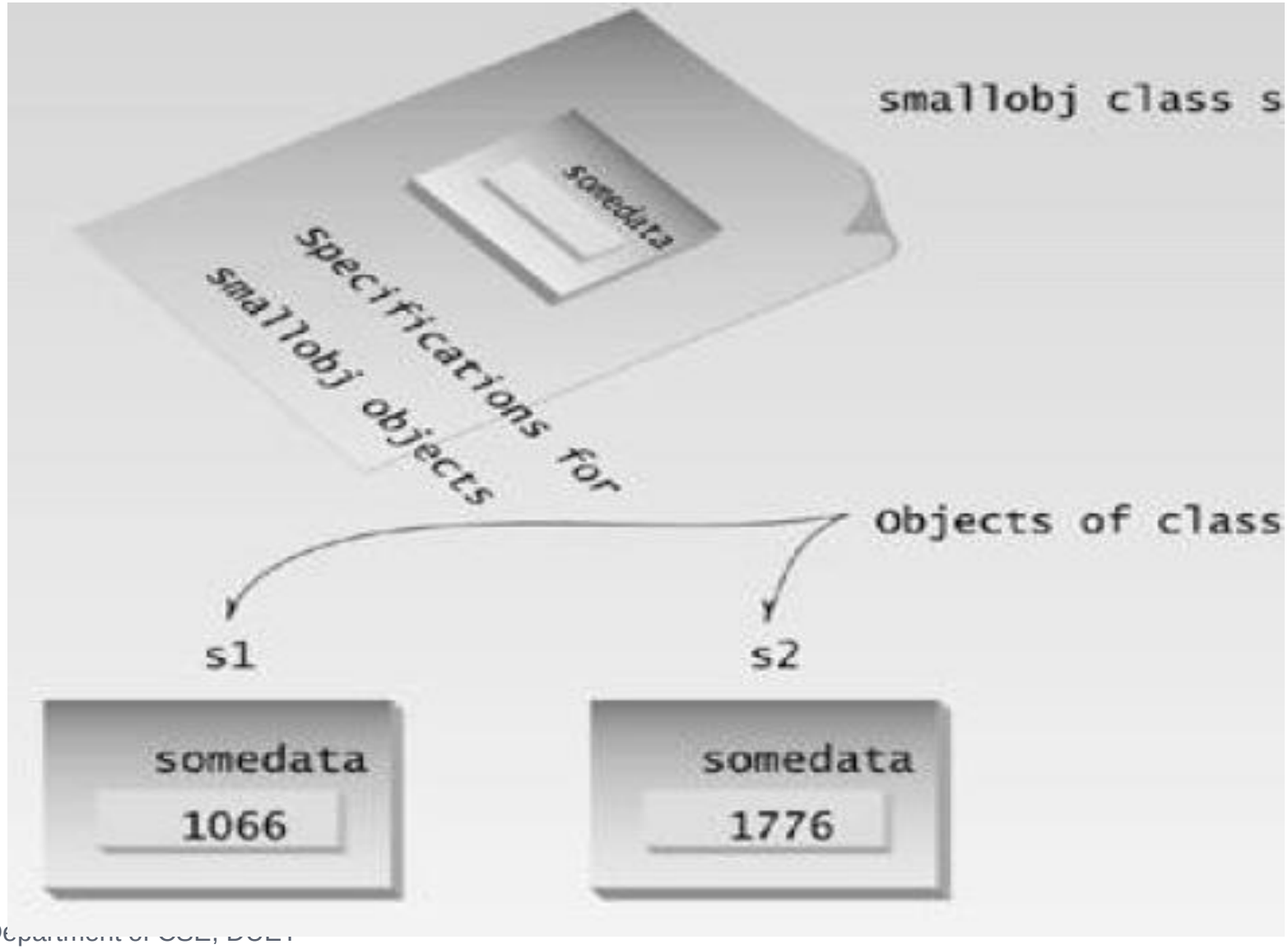
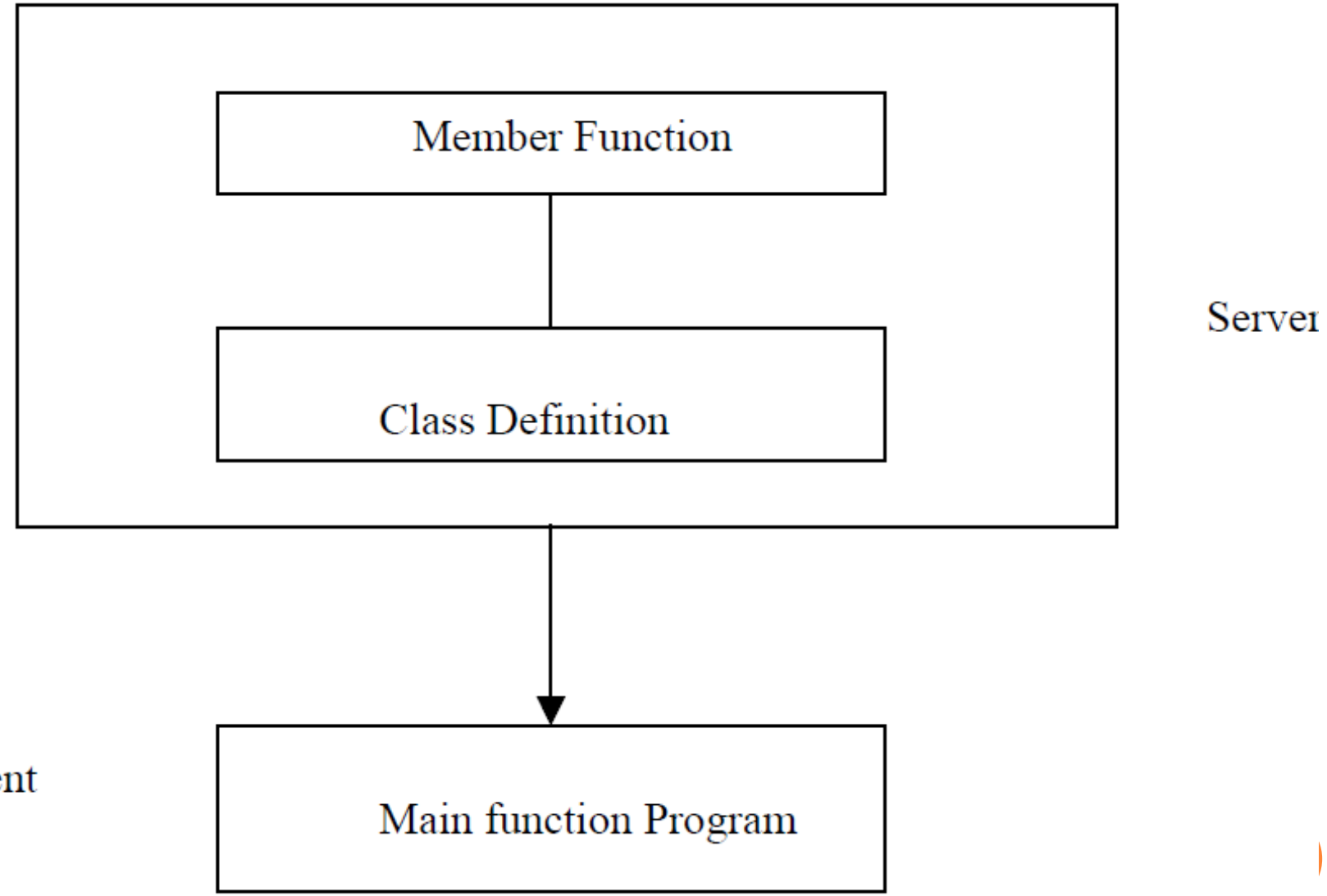


Fig. 1.10 *The client-server model*



Classes: A First Look (cont.)

- Each object of a class has its own copy of every variable declared within the class (except static variables which will be introduced later), but they all share the same copy of member functions.
  - How do member functions know on which object they have to work on?
    - The answer will be clear when "***this***" pointer is introduced.

Lecture Contents

- Teach Yourself C++
  - Chapter 1 (1.5 Full, with exercises)

- Object oriented Programming by C++ [R.Lafore]
  - Chapter 1 (With excercises)