Lecture 23 OOP Summary CSI333

Object Oriented Programming Intro.: References:

1. CSI333 Lab Exercise 5; carefully read comments in lab code.

2. Stroustrup Date class example: Sections 10.1, 10.2.1-10.2.3, 10.2.7(intro), 10.2.8, 10.3

“Structs with member functions” can implement programmer defined data types. The full “Object Oriented Programming” idea adds inheritance and polymorphism.
A language (such as C++ or Java) that supports Object Oriented Programming allows programmers to create their own operations on types they create themselves, that work like built-in operations (such as +) on built-in types (such as ints).

The material on Object Oriented Programming in this course is summarized as follows:

1. `struct  classname { ... };` defines `classname` as the name of a programmer defined data type. The `struct` body can declare data members and prototypes of member functions.

2. A (non-static) member function is like an ordinary C++ function except it can be called only for a specific variable (or object) of the data type.

3. A member function is defined with its class name in front of the function name, separated by the “class resolution operator” :: (double colon).

4. A (non-static) function member is called for a specific variable using the “dot” syntax for structure data member access:
   
   `variable . memfunction( arguments );`
   
   If `pin` is a pointer variable, we can code `pin->memfunction( arguments );`
5. During a call to a member function and within the function member body, names of data members refer to fields in the object for which the member function was called. Also, the keyword this denotes a pointer to that object.

When the member function is called, a pointer to the object is passed as a “hidden” parameter to make this work. Unlike with ordinary functions that programmers must remember to use with particular objects, the programmer does not have to explicitly code a pointer to the particular object as a parameter.

6. Except for constructors and destructors, member functions must be declared with a return type.

7. A constructor function is called when the associated object’s lifetime begins, be it automatic, static or free-store.

Constructors are named with the name of the struct or class that they belong to.