Constructors

Constructors

- A method whose name is the <u>same</u> as the class name.

- It is invoked (called) automatically whenever an instance of the class is created. That is, when a variable of the class type is declared (or constructed).

Uses of Constructors

- Used to initialize variables, for example to initialize elements of an array.

- Anytime you need a method to be called automatically upon creating an object (variable of a class type).

Implementing a Constructor

Using our Car program:

Reasoning: Every car has a base price, so a base price should always be entered. That is, the BasePrice( ) method should always (automatically) be called.

The Code

Car( ) {
cout << "Input the auto Base Price: "
cin >> baseprice;
cout << "\n";
return; }

No Return Value ←

Constructors do not return values

Anytime an object variable is created, this constructor (the <u>default constructor</u>) will be invoked (called)

The *default constructor* is the constructor that can be invoked with <u>no</u> arguments

Constructors with Arguments

- Suppose you also want to initialize (call automatically) an object that requires an input parameter.

  - You can do this with a constructor that requires a parameter

    ✓ For example, suppose you need to input a color automatically to the requested car in our program example

The Code

```
Car (string color) {
extcolor = color;
cout << "The car color is:" << extcolor << endl;
return;  }
```

//Note: constructors do not
// return values

To call the constructor (from main ( )) use:

```
Car Ford("Metallic Red");
```

// creates a new object:
// Ford and calls the one
// parameter constructor

Car Programming Assignment

- Add two constructors to your Car program.

  ★ One constructor should be the default constructor with no parameters

  ★ The second constructor should take in one parameter.

  ★ Create objects in your main( ) program that will invoke these constructors

Programming Assignment

Implement a CollegeStudent class with appropriate data members such as Name, Year, ExpectedGraduationYear, Major, Minor, GPA, etc... The class should have at least 6 methods in its public section. For example, there should be a method to compute GPA and another method to determine whether the GPA achieves the Dean's list or Probation. Also, you MUST use at least one constructor.