C# Properties (Get and Set)

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Properties and Encapsulation

Before we start to explain properties, you should have a basic understanding of "**Encapsulation**".

The meaning of **Encapsulation**, is to make sure that "sensitive" data is hidden from users. To achieve this, you must:

- declare fields/variables as `private`
- provide `public` `get` and `set` methods, through **properties**, to access and update the value of a `private` field

Properties

You learned from the previous chapter that `private` variables can only be accessed within the same class (an outside class has no access to it). However, sometimes we need to access them - and it can be done with properties.

A property is like a combination of a variable and a method, and it has two methods: a `get` and a `set` method:

Example

```
class Person
{
  private string name; // field

  public string Name   // property
  {
    get { return name; }   // get method
    set { name = value; }  // set method
  }
}
```

Example explained

The `Name` property is associated with the `name` field. It is a good practice to use the same name for both the property and the private field, but with an uppercase first letter.

The `get` method returns the value of the variable `name`.

The `set` method assigns a `value` to the `name` variable. The `value` keyword represents the value we assign to the property.

If you don't fully understand it, take a look at the example below.

Now we can use the `Name` property to access and update the `private` field of the `Person` class:

Example

```
class Person
{
  private string name; // field
  public string Name   // property
  {
    get { return name; }
    set { name = value; }
  }
}

class Program
{
  static void Main(string[] args)
  {
    Person myObj = new Person();
    myObj.Name = "Liam";
    Console.WriteLine(myObj.Name);
  }
}
```

The output will be:

```
Liam
```

Run example »

Automatic Properties (Short Hand)

C# also provides a way to use short-hand / automatic properties, where you do not have to define the field for the property, and you only have to write `get;` and `set;` inside the property.

The following example will produce the same result as the example above. The only difference is that there is less code:

Example

Using automatic properties:

```
class Person
{
  public string Name  // property
  { get; set; }
}

class Program
{
  static void Main(string[] args)
  {
    Person myObj = new Person();
    myObj.Name = "Liam";
    Console.WriteLine(myObj.Name);
  }
}
```

The output will be:

```
Liam
```

Run example »

Why Encapsulation?

- Better control of class members (reduce the possibility of yourself (or others) to mess up the code)
- Fields can be made **read-only** (if you only use the `get` method), or **write-only** (if you only use the `set` method)
- Flexible: the programmer can change one part of the code without affecting other parts
- Increased security of data

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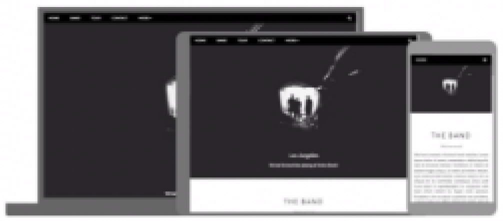

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