**Topic 1: Review Classes**

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**Content**

**Reading**

[Reading](https://dmacc.blackboard.com/webapps/blackboard/content/listContent.jsp?course_id=_102593_1&content_id=_7286755_1)

Object-Oriented Programming C#

* + Microsoft:docs.microsoft.com
    - [Object-Oriented Programming (C#)](https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/concepts/object-oriented-programming)
  + GeeksForGeeks: geeksforgeeks.com
    - [C# | Class and Object](https://www.geeksforgeeks.org/c-sharp-class-and-object/)
  + TutorialsPoint: tutorialspoint.com
    - [C# - Classes](https://www.tutorialspoint.com/csharp/csharp_classes.htm)
  + W3Schools: w3schools.com
    - [C# OOP](https://www.w3schools.com/cs/cs_oop.asp)

Examples of Classes

* + [Tutorials Point C# Classes](https://www.tutorialspoint.com/csharp/csharp_classes.htm)
  + [Microsoft C# Classes](https://docs.microsoft.com/en-us/dotnet/csharp/programming-guide/classes-and-structs/classes)
  + [Stackoverflow C# Classes](https://stackoverflow.com/questions/6125351/good-class-design-by-example)

**Review Classes**

[Review Classes](https://dmacc.blackboard.com/webapps/blackboard/content/listContent.jsp?course_id=_102593_1&content_id=_7286755_1)

https://youtu.be/0S\_UMEw5nqc

public class Building

{

private string \_address;

private double \_size; // in square feet

// Constructors

public Building()

{

}

public Building(string address, double size)

{

Address = address;

Size = size;

}

// Properties

public string Address

{

get { return \_address; }

set { \_address = value; }

}

public double Size

{

get { return \_size; }

set { \_size = value; }

}

// Methods

public override string ToString()

{

return "Buidling at " + Address + " is " + Size.ToString() + " ft^2.";

}

}

**Classes IRL (in real life)**

[Classes IRL (in real life)](https://dmacc.blackboard.com/webapps/blackboard/content/listContent.jsp?course_id=_102593_1&content_id=_7286755_1)

The use of a class to model real world objects and behaviors. You want your program to mimic the real world object as closely as possible. There are times when you will code to help improve a process, such as business process, but when writing classes you are generally writing a model of existing behaviors.

In the example Houseclass, the address was a string. It might be better to make an Address class to future refine the idea of the address object represented by a string in the house class. Class fields are not limited to built-in data types and **string**, they can be a **List**, objects of a user-defined class, even a  **List** of user-defined classes!

The Address class below, that you will implement, could then become a field of the House class. How might that change the Address Property? Discuss this question on this on this week's discussion board!

[**Address Class**](https://dmacc.blackboard.com/webapps/assignment/uploadAssignment?content_id=_7286771_1&course_id=_102593_1&group_id=&mode=view)

Model the real world idea of an Address. How many fields will you need? What data type will each be?

123 Main Street Apt J2

Small Town, Iowa 55555

Write a class called Address in a Namespace Module9 (for testing) following the outline below. Make sure the print methods returns a string to display the address as above. (HINT: It is not called print, it returns a string and is an overridden method.) Your class should be public for testing as well.

public class NAME

{

// Fields

// Constructors

// Field1 property

// Field2 property

...

// FieldN property

// add any necessary methods

}

Test your print method: [UnitTestAddress.cs](https://dmacc.blackboard.com/bbcswebdav/pid-7286771-dt-content-rid-101466185_1/xid-101466185_1)

Submit Address.cs only.

This is 10 points.

**Classes in Classes**

[Classes in Classes](https://dmacc.blackboard.com/webapps/blackboard/content/listContent.jsp?course_id=_102593_1&content_id=_7286755_1)

You have been building classing using built-in data types (int, decimal, etc). You are not limited to using only built-in data types. In fact, you have been  using a class as well, when you [string](https://docs.microsoft.com/en-us/dotnet/api/system.string?view=net-5.0). Your string variables have the storage and associated actions ([ToUpper()](https://docs.microsoft.com/en-us/dotnet/api/system.string.toupper?view=net-5.0" \o "ToUpper), [Substring(Int32)](https://docs.microsoft.com/en-us/dotnet/api/system.string.substring?view=net-5.0), etc)

You do not need to rely on the library classes in C#, you use any class in another class. You can declare variables and make objects of any class within a class.

**Example Person Class with fun short cuts in Visual Studio:**

https://youtu.be/FR6T-dzpNSM

**What's missing in the above class?**

**https://youtu.be/zCUl3TOrByE**

**File:** [**Person.cs**](https://dmacc.blackboard.com/bbcswebdav/pid-7286773-dt-content-rid-101466179_1/xid-101466179_1) **Example Testing Person Class:**

**https://youtu.be/lUzbF-YxfBQ**

**Example Student Class with Person Property:**

**https://youtu.be/X9XeSpBamsI**

**What's missing in the above class?**

**https://youtu.be/jtVUL8BIUVs**

**Example Testing Student Class:**

**https://youtu.be/-jsTiLHLRVg**

**File:** [**Student.cs**](https://dmacc.blackboard.com/bbcswebdav/pid-7286773-dt-content-rid-101466180_1/xid-101466180_1) **Extra! Renaming Properties in Visual Studio:**

**https://youtu.be/b5Y73BE\_1S0**

[**Using Class Composition**](https://dmacc.blackboard.com/webapps/assignment/uploadAssignment?content_id=_7286774_1&course_id=_102593_1&group_id=&mode=view)

In this assignment, you will use the class Address as property in your class House. (This is composition)

Find the House class example, add to a file House.cs.

Replace class string property with a variable of type Address, the class that you created.

What do you need to change in the Constructor? Change that and add a comment on what you changed and why.

How will the property Address look with get and set? Add the needed code and don't forget to remove the string property get and set. Add a comment on the get and set.

Submit House.cs and Address.cs files

This is 10 points.

**Use classes: DateTime**

[Use classes: DateTime](https://dmacc.blackboard.com/webapps/blackboard/content/listContent.jsp?course_id=_102593_1&content_id=_7286755_1)

While you can write your own classes, there are also classes in the C# library you can use. DateTime is an example. Read about using this library!

[Shape, square

Description automatically generatedDateTime Struct (System) Represents an instant in time, typically expressed as a date and time of day. dotnet-bot](https://docs.microsoft.com/en-us/dotnet/api/system.datetime?view=net-6.0)

[Logo, company name

Description automatically generatedWorking with Date and Time in C# C# includes DateTime struct to work with dates and times. To work with date and time in C#, create an object of the DateTime struct using the new keyword.](https://www.tutorialsteacher.com/csharp/csharp-datetime)

[A picture containing logo

Description automatically generatedDateTime In C# Here is a detailed tutorial on C# DateTime class and how to work with dates and times using C#. Manas Mohapatra](https://www.c-sharpcorner.com/article/datetime-in-c-sharp/)