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\* Part 6: AsyncDelegates

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\* Topic: Use a callback for asynchronous calls to capture and display the

\* return value:

\* 1. using directive for System.Runtime.Remoting.Messaging

\* 2. Callback method that is implemented in the client class and yet

\* executed on the asynchronous thread. It must match the

\* signature of the AsyncCallback delegate.

\* 3. Steps in the callback method for executing the EndInvoke method

\* and retrieving the return value.

\* 4. Steps for making the asynchronous call including the callback

\* delegate.

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\* Be sure to provide an integer value on the command line. To do this:

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\* 1) Right-click on the project in Solution Explorer and click

\* Properties.

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\* 2) In the Properties window, click the Debug tab.

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\* 3) In the "Command line arguments" field, enter a whole number.

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usingSystem**;**

usingSystem.Collections.Generic**;**

usingSystem.Text**;**

usingSystem.Runtime.Remoting.Messaging**;**

namespaceAsyncDelegatesDemo

**{**

// Add a delegate that the signature we need to call the

// CalculateValue() method.

internaldelegatedoubleDoSomething **(**doubled1**,** doubled2**);**

internalclassComplicatedCalculator

**{**

// Member variable that represent the number of milliseconds

// to pause the thread.

privateint\_millisecondsToPause=0**;**

publicComplicatedCalculator**(**intmillisecondsToPause**)**

**{**

MillisecondsToPause=millisecondsToPause**;**

**}**

// This method represents a task that could potentially run for

// a long period of time.

internaldoubleCalculateValue

**(**doublefirstNumber**,** doublesecondNumber**)**

**{**

doubleanswer=0**;**

// Save the foreground color of the console window.

ConsoleColororiginalcolor=Console.ForegroundColor**;**

// Change the foreground color in the console.

Console.ForegroundColor=ConsoleColor.Red**;**

// Display a message that we're starting the task.

Console.WriteLine**(**"\n\tStarting the calculation task..."**);**

// Set the console color back to the original value.

Console.ForegroundColor=originalcolor**;**

// Pause for a moment.

System.Threading.Thread.Sleep**(**MillisecondsToPause**);**

// Perform the calculation.

answer=Math.Pow**(**firstNumber**,** secondNumber**);**

// Pause for another moment.

System.Threading.Thread.Sleep**(**MillisecondsToPause**);**

// Change the foreground color in the console.

Console.ForegroundColor=ConsoleColor.Red**;**

// Display a message that we're done with the task.

Console.WriteLine**(**"\n\tDone with the calculation task."**);**

// Set the console color back to the original value.

Console.ForegroundColor=originalcolor**;**

returnanswer**;**

**}**

privateintMillisecondsToPause

**{**

get **{** return\_millisecondsToPause**; }**

set

**{**

if **(**value<0**)**

**{**

thrownewArgumentException

**(**"Milliseconds must be greater than or equal to 0."**);**

**}**

\_millisecondsToPause=value**;**

**}**

**}**

**}**

classProgram

**{**

internalstaticvoidComputationComplete**(**IAsyncResultplainResult**)**

**{**

AsyncResultar= **(**AsyncResult**)**plainResult**;**

DoSomethingoperation= **(**DoSomething**)**ar.AsyncDelegate**;**

doubleresults=operation.EndInvoke**(**plainResult**);**

// Display the results.

Console.WriteLine**(**"\n\tThe result is: {0}"**,** results**);**

**}**

privatestaticintGetMilliseconds**(**strings**)**

**{**

intmilliseconds=0**;**

// If this call fails, milliseconds will be set to zero.

if **(**int.TryParse**(**s**,** outmilliseconds**))**

**{**

// If the user types in a low number, let's assume

// that they entered in the number of seconds and

// convert the value to milliseconds.

if **(**milliseconds<250**)**

**{**

milliseconds\*=1000**;**

**}**

**}**

returnmilliseconds**;**

**}**

staticvoidMain**(**string**[]** args**)**

**{**

try

**{**

// Display a message to show we're in Main().

Console.WriteLine**(**"Starting the program."**);**

// Get the number of milliseconds from the arguments

// passed in from the command line.

intmilliseconds=GetMilliseconds**(**args**[**0**]);**

// Create the ComplicatedCalculator object.

ComplicatedCalculatorcc=

newComplicatedCalculator**(**milliseconds**);**

// Create the delegate object.

DoSomethingmethod=newDoSomething**(**cc.CalculateValue**);**

// Create the callback delegate.

AsyncCallbackcallbackMethod=

newAsyncCallback**(**ComputationComplete**);**

// Call the delegate asynchronously.

IAsyncResultasynchStatus=method.BeginInvoke

**(**10.4**,** 7.451**,** callbackMethod**,** null**);**

// Display some messages to show that Main() is still

// responsive while the calculation is going on.

Console.WriteLine**(**"\nNow I'm going to go do something else."**);**

System.Threading.Thread.Sleep**(**1500**);**

Console.WriteLine**(**"Like talk about the weather."**);**

System.Threading.Thread.Sleep**(**1500**);**

Console.WriteLine**(**"Or the latest news."**);**

System.Threading.Thread.Sleep**(**1500**);**

Console.WriteLine**(**"You know, my foot hurts."**);**

System.Threading.Thread.Sleep**(**1500**);**

Console.WriteLine**(**"I love hotdogs!"**);**

System.Threading.Thread.Sleep**(**1500**);**

Console.WriteLine**(**"How much is a shake at Burgermaster?"**);**

System.Threading.Thread.Sleep**(**1500**);**

Console.WriteLine**(**"Ok, now I'm getting hungry!"**);**

System.Threading.Thread.Sleep**(**1500**);**

**}**

catch **(**Exceptione**)**

**{**

Console.WriteLine**(**"\nEXCEPTION: {0}."**,** e.Message**);**

**}**

// Pause so we can look at the console window.

Console.Write**(**"\n\nPress <ENTER> to end: "**);**

Console.ReadLine**();**

**}**

**}**

**}**