

Assignment 6 – Dependency Injection
COS318 – FA2015

Due Date: October 22th, 2015

Turn in all files using Moodle

Your sixth assignment is full of dependencies and hobbits. Frodo and Sam are dependent on Aragorn and the humans distracting Sauron. Gondor is dependent on help from Rohan. You are dependent on the code from GitHub. You will need to download all of the code in the Assignment6 folder. The server folder contains all of the code you will be editing for this assignment. The client folder contains some helper html and javascript to test your server code.

There are four bad service dependencies in the Assignment6 code that you will need to update.

1. **(20 Points) MemoryDatabase**

- a. HobbitController keeps track of a list of hobbits in a database. However, it is currently coupled with MemoryDatabase. Update the controller so that it receives an instance of an IDatabase in the constructor.
- b. Create an IDatabase interface based on the MemoryDatabase class.
- c. There should only ever be one instance of MemoryDatabase created for the lifetime of the application.
- d. Don't create an instance of MemoryDatabase yourself. Let it to be created for you by the framework.

2. **(20 Points) ConsoleLogger**

- a. ConsoleLogger is a singleton class. It creates its own instance that is then used everywhere else in the application to write debug messages.
- b. Create an ILogger interface based on the ConsoleLogger class.
- c. Update all references to ConsoleLogger to depend on and use ILogger instead.
- d. There should only ever be one instance of ConsoleLogger created for the lifetime of the application.
- e. Do not make any changes to the ConsoleLogger class.

3. **(20 Points) GuidRequestIdGenerator**

- a. RequestIdFilter adds a unique request-id header to each response. However, currently it only is using the static string "local-id." Update the RequestIdFilter so it depends on a IRequestIdGenerator.
- b. Create an IRequestIdGenerator interface based on the GuidRequestIdGenerator class.
- c. A new IRequestIdGenerator instance should be created each time one is needed.

4. **(20 Points) StopwatchService**

- a. StopwatchFilter tracks the amount of time each step of the request is taking. It then outputs the result into a response header.
- b. Update all references to StopwatchService so that during a request all references share the same instance.
- c. You do not need to create an interface for StopwatchService. You may use it directly.

5. **(20 Points) Code style, formatting, completeness, and quality.**

The Rules

1. Running all the tests on the assignment6.html page will help a lot in making sure your updates are working correctly. The tests are not exhaustive to all possible scenarios. Make sure to double check your work even if all of the tests are passing.
2. ConsoleLogger doesn't have any tests in the provided html or javascript. You'll have to ensure this is working on your own.
3. You don't need to turn in the html or javascript files. I already have those.

Stretch Levels

If you already have a lot of experience with dependency injection, or if you just want to go hunt some orc, try to complete these stretch levels for extra credit. The levels are cumulative, so for example, don't try for silver if you haven't finished bronze. If you try for the stretch levels, make sure to type it in the comments on Moodle so I don't miss it.

Bronze Level (Gimli)

The customer changed the requirements. It turns out we do need more than one StopwatchService after all. Add an interface and depend on that interface for StopwatchService across the application like you did in steps 1-3.

Silver Level (Legolas)

ConsoleLogger (ILogger) shouldn't be logging requests directly in the controller. Create a new filter or middleware that logs the request path, query, and method, then remove all ILogger references from HobbitController.

Gold Level (Aragorn)

Update StopwatchFilter to also add the total request time in a different header called 'totaltime.' Be careful to make sure this header is actually useable by the browser.