FINBOURNE
LIBERATE / SIMPLIFY / CONNECT

FINBOURNE Coding Exercise

Introduction

We invite you to complete this short coding exercise! This problem is designed to be representative of the kind of tasks we work on at FINBOURNE, and gives you an opportunity to demonstrate your practical coding ability.

The Objective

Background

Our application – LUSID – handles large volumes of data, and also needs to be fast. One strategy to improve the execution speed of our code is to cache regularly-used data in memory.

Task

You have been asked to create a generic in-memory cache component, which other FINBOURNE developers can use in their applications.

This component should be able to store arbitrary types of objects, which are added and retrieved using a unique key (similar to a dictionary).

To avoid the risk of running out of memory, the cache will need to have a configurable threshold for the maximum number of items which it can hold at any one time. If the cache becomes full, any attempts to add additional items should succeed, but will result in another item in the cache being evicted. The cache should implement the 'least recently used' approach when selecting which item to evict.

The cache component is intended to be used as a singleton. As such, you should ideally make your component thread-safe for all methods, but you can skip this feature if you run out of time.

Another useful feature would be some kind of mechanism which allows the consumer to know when items get evicted. Again, if you run out of time, you can skip this feature too.

Constraints

- Please write the solution in C# and .NET
- You may use any .NET framework version you wish
- You may use any development tools you wish
- You are permitted to use external libraries (e.g. nuget packages)

Note: we appreciate there are cache implementations already available in .NET which could be used 'off the shelf' to solve this problem entirely. Whilst we do value pragmatism, please create your own solution, to give you the best opportunity for you to demonstrate your skills.

Guidelines

Please try and write your solution in a similar style to how you would tackle a task in a real working environment.

As per our values, we are looking for a solution which is:

- Correct
- High-quality
- Pragmatic

You are welcome to use any resources you like to help solve the problem, though obviously we expect you to write the code yourself.

The task can probably be completed in a few hours, though you’re welcome to take longer if you wish. Please make a note of how long you spent, and include this with your solution. But bear in mind we are more interested in your approach and the quality of your software, as opposed to how fast you can complete the task.

When you are complete, please share your source code with us, in whichever way you find most convenient.

Good luck!