Developing a modern collections library

SECTION 3

Problem: Dynamic collections library in a language such as Java which has many classes for its collections.

Problem to be solved: It may change the way that people approach collections Java if they are to have a more powerful “out of the box” collections library. Things could get faster or easier to implement. Takes some difficulty out of development.

Parallelism is important and something to be considered. Having good support and a robust way of dealing with parallelism in a library. (Refer back to 4.3 and multi-threading of Stafans paper.) Potentially create a more efficient form of parallel support than what Java currently offers which works but is not necessarily efficient. “*The simplest solution to ensure correctness is to provide synchronization wrappers as done by Java and C#. However, this approach is rarely efficient and often lacks support for performing multiple operations safely together.”*

Collection usage. There is no point in programming a very specific function into a collection if programmers won’t know it exists or use it. (Refer back to Stefans paper section 5 Collection usage)

Proposal centred around the use of specifically: Sequences, Maps and Sets

SECTION 4

Develop the library around the basic needs of a collection library. Then look into what might be beneficial to the programmer. Gradually develop the library from this jumping on point and add more things to it. Test and redo. Benchmark against existing solutions i.e. built-in languages or existing solutions. Document the development of the library and choices made in order to provide some kind of written word on how libraries are developed.

The library will be used instead of the standard Java collections library in order to show an improvement.

Hypothesis: Only three collections are needed: Sets, Sequences and Maps in order to produce a modern collections library.

A collection is a class that is used to group similar objects. So, for example grouping of people, numbers or integers. These are featured in every general-purpose language to an extent. This could be with arrays in C or complex HashMaps in Java. They are used in almost every conceivable complex program.

SECTION 5

Expected time 8 months. September – April. Expecting to spend about 5 months just on development of the library. Then potentially another 2 months improving and testing the library. Then a further 1 months on the write up process and creation of the poster.

SECTION 6

I will demonstrate my research into the development of a modern collections library by converting old programs I myself have written to using this as well as programs that have been supplied to me. They will all be benchmarked against my library to see hopefully that mine is much faster and easier to use showing a benefit to the user.

This should function as a generally good example of how to use the library and also demonstrate the benefits of doing so. Hopefully improving some of the programs runtimes as I do.