Revised Contents Proposal

"Programming Effectively with Garbage Collection" (provisional title; likely to include "Java") by P. Tucker Withington and Andrew Shires. January 1998.

1 Proposed contents

Introduction / A simple example / Manually managed C++ version / Java version / Java version where GC performs poorly / Java version where GC works well / Summary

4. Guidelines for Using Garbage Collection

Introduction / Garbage collection is not a panacea / Data structure integrity / Allocation issues / Heap-growth issues and infinitely accumulating structures / The garbage collector's model of heap data / Summary

Part III. Managing Your Memory

5. Understanding Java's Memory Model

Introduction / Static data / Immediate data / Dynamic-extent data / Indefinite-extent data / Examples of indefinite-extent data / Summary

6. Understanding Garbage Collectors

Introduction / Memory states / Compacting and copying garbage collectors / Generational garbage collectors / Summary

Part IV. Cooking With Garbage Collection

7. About the recipes (maybe "patterns")

Introduction / The format of the recipes (maybe "patterns")

8. Recipes (maybe "patterns")

"String Theory" / "Less Filling" / "All Strung Out" / "Very Resourceful" / + others / Summary

Part V. Measurement And Analysis

9. Analyzing Memory Behavior

Introduction / Developing a model / Observing program behavior / Investigating the discrepancies / Summary

10. Simple Measurements

Introduction / Gross measurements / Measuring memory consumption / Profiling allocation / "Garbology" / Summary

11. Tools

Introduction / Allocation profilers / Heap browsers / Why is this object alive? / "Cost" of an object / Object dependencies / Advanced "garbology" / Summary

12. Working with the Garbage Collector

Introduction / Trading off speed and space / Tuning responsiveness / Pools / Resources / Finalization / Weakness / Lifetime declarations

13. Advanced topics

Mixing manual and automatic management / Native methods / Plug-in garbage collectors / Writing your own garbage collector / Summary

Appendix A. How Garbage Collection Works

1. Garbage Collection Theory.

2. A Simple Garbage Collector.

Glossary

Bibliography