UNIVERSITEIT VAN PRETORIA
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Department of Computer Science
University of Pretoria

Generic Programming
COS782

Assignment 2

12 May 2024

1 Introduction

During the module we have looked (and will be looking) at a number of generic implementations of design patterns as described by Alexandrescu [2001]. Some of the implementations make use of a policy-based approach, while others rely on template meta-programming to realise the generalised implementation of the pattern.

2 Instruction

In groups of 2, 3 or 4, choose one of the classic design patterns from Gamma et al. [1995] and implement a generic version of the pattern in a language of your choice. Notes on each of the design patterns (except Flyweight) are available at [Marshall and Pieterse, 2021]: `https://www.cs.up.ac.za/cs/lmarshall/TDP/TDP.html`.

If you choose C++ as your language of choice, you must choose a pattern we did not discuss (or will not be discussing) in the lectures – that is you may not choose Singleton, Factory Method, Abstract Factory or Visitor.

Show how a generic version of the pattern can be derived and how it can be applied to a typical scenario where the pattern is used.

3 Submission

Date issued: 12 May 2024

Deliverable: A short report and a generic version of the chosen pattern in a library with example code showing how to use the library. Place all your files in a single archive and upload the archive to ClickUP.

Due date: 6 June 2024 at 23:00.

4 Assessment

Assessment of this assignment will be on the short group report and the library.

References

Andrei Alexandrescu. *Modern C++ Design: Generic Programming and Design Patterns Applied*. Addison-Wesley Longman Publishing Co., Inc., Boston, MA, USA, 2001. ISBN 0-201-70431-5.

Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides. *Design Patterns: Elements of Reusable Object-oriented Software*. Addison-Wesley Longman Publishing Co., Inc., Boston, MA, USA, 1995. ISBN 0-201-63361-2.

Linda Marshall and Vreda Pieterse. Tackling design patterns, 2021. URL `https://www.cs.up.ac.za/cs/lmarshall/TDP/TDP.html`.