Resource Handling

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Introduction

One of the challenges when developing code with languages that do not have *so-called* garbage collection is that one has to be very careful to release acquired resources at some point. Unfortunately this, rather simple task, is very often forgotten or at least improperly handled. In the latter case the cause may be multiple-return-paths. Regardlessly of the reason, we need to devise a scheme that can aid us in ensuring that the resources used are released properly. In this lecture we will therefore learn about RAII and the more specialised derived versions.

Content and reflection

Themes

- Resource Handling
  - RAII[2, 1]
    Basics regarding RAII

  - Smart pointer[1, 3]

  - Counted body[1, 4]

  - Boost Smart pointer[1, 5]
    Not in detail, but get an idea of usage and features. Take a look at the examples though, they are quite informative.

- Fundamentals in C++ - class resources
  - Rule of 3[1, 6]

Read in order

Questions

- What is it that RAII facilitates that is so important

- How, from an implementational point of view, is this achieved

- RAII can be used whenever we are dealing with a *resource*, but what *is* a resource

- What differentiates SmartPointer from simpel RAII?
  - Which operator overload are added/implemented

  - What do they do

- What differentiates Counted Smart Pointer from simpel SmartPointer?
  - What is it in the *counted smart pointer* that makes it counted

  - What type of variable is it and from a memory/object perspective where is it placed and why is this so important

- What is Rule of 3

Material

Slides

[1] S. Hansen, *Resource handling*, Slides - see course repos.

Online

[2] Unknown. (). Resource acquisition is initialization (raii), [Online]. Available: `https://en.wikibooks.org/wiki/More_C%2B%2B_Idioms/Resource_Acquisition_Is_Initialization`.

[3] ——, (). Smart pointer, [Online]. Available: `https://en.wikibooks.org/wiki/More_C%2B%2B_Idioms/Smart_Pointer`.

[4] ——, (). Counted body, [Online]. Available: `https://en.wikibooks.org/wiki/More_C%2B%2B_Idioms/Counted_Body`.

[5] ——, (). Boost smart pointer, [Online]. Available: `http://www.boost.org/doc/libs/1_60_0/libs/smart_ptr/shared_ptr.htm`.

[6] ——, (). Rule of three, [Online]. Available: `https://en.wikipedia.org/wiki/Rule_of_three_(C%2B%2B_programming)`.

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