

CoCoALib - Feature #138

Automatic conversion from bool3 to bool?

24 Apr 2012 17:09 - John Abbott

<b>Status:</b>	Closed	<b>Start date:</b>	24 Apr 2012
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	John Abbott	<b>% Done:</b>	100%
<b>Category:</b>	Safety	<b>Estimated time:</b>	2.00 hours
<b>Target version:</b>	CoCoALib-0.99533 Easter14	<b>Spent time:</b>	1.30 hour
<b>Description</b>			
<p>The BOOST equivalent of bool3 is called tribool. It offers automatic conversion to and from bool.</p> <p>I have already established that auto conversion from bool gives us problems (because the C++ compiler thinks that tribool is as good a match as MachineInt for any integral value). This was evident with operator&lt;&lt; for OpenMath streams.</p> <p>While writing the matrix solve fn I wanted to test quickly whether a ring is a PID, because if so then there is a quick and simple algm to compute the answer. But testing whether a ring is a PID is costly; however, one can do a fast check which returns a bool3 result -- essentially it recognises some easy cases, otherwise it says it doesn't know. Compare the two lines of code below:</p> <p>Currently we must convert explicitly from bool3 to bool like this:</p> <pre>if (IsDefinitelyTrue(IsPIDFast(R))) return SolveByHNF(M, rhs);</pre> <p>If the conversion were automatic, the code could be simplified to this:</p> <pre>if (IsPIDFast(R)) return SolveByHNF(M, rhs);</pre> <p>The difference is not huge. There is a trade-off between "safety" and readability.</p> <p>In this case if the auto conversion maps DefinitelyTrue to true and the other values to false then we get simpler more readable code.</p> <p>On the other hand if there is auto conversion then a careless user might write code blissfully unaware that IsPIDFast returns a bool3 -- I'm not sure if this can lead to serious problems.</p> <p>Opinions?</p>			
<b>Related issues:</b>			
Related to CoCoALib - Feature #152: Replace bool3 by tribool		Closed	04 May 2012
Related to CoCoALib - Feature #153: Shorter simpler names for some bool3 valu...		Closed	04 May 2012

History

#1 - 27 Apr 2012 12:10 - Anna Maria Bigatti

John Abbott wrote:

The BOOST equivalent of bool3 is called tribool. It offers automatic conversion to and from bool.

The difference is not huge. There is a trade-off between "safety" and readability.

On the other hand if there is auto conversion then a careless user might write code blissfully unaware that IsPIDFast returns a bool3 -- I'm not sure if this can lead to serious problems.

Opinions?

I propose a new coding convention for bool3 values and functions.  
For example **IsPIDFastBool3** or **IsPIDBool3**.  
It is essential to stress that the value is a bool3 (for safety).

**#2 - 04 May 2012 21:30 - John Abbott**

- % Done changed from 0 to 30

I have modified **operator<<** for OpenMath streams so that they handle explicitly machine integers (rather than **MachineInt**). This permits us to allow automatic conversion from **bool** to **bool3** without problems [I have verified this by compiling].

**#3 - 01 Apr 2014 17:35 - Anna Maria Bigatti**

- Target version set to CoCoALib-0.99533 Easter14

**#4 - 07 Apr 2014 14:33 - John Abbott**

- Category set to Safety
- Status changed from New to Feedback
- % Done changed from 30 to 90

JAA thinks this has been resolved by [#153](#).

Conclusion: **no automatic conversion to bool**, just the shorter names decided in [#153](#).

**#5 - 15 Apr 2014 12:54 - John Abbott**

- Status changed from Feedback to Closed
- Assignee set to John Abbott
- % Done changed from 90 to 100
- Estimated time set to 2.00 h