

Isabelle document preparation with Dagstuhl LIPICs style

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Abstract

Isabelle is a formal document preparation system. This example shows how to use it together with the Dagstuhl LIPICs style. See <https://www.dagstuhl.de/en/publications/lipics/instructions-for-authors> for further information.

2012 ACM Subject Classification General and reference → General literature; General and reference

Keywords and phrases Document preparation

Digital Object Identifier 10.4230/LIPICs.CVIT.2016.23

1 Some section

1.1 Some subsection

1.2 Some subsubsection

1.2.1 Some subsubsubsection

1.2.1.1 A paragraph.

Informal bla bla.

definition $foo = True$ — side remark on foo

definition $bar = False$ — side remark on bar

lemma foo *<proof>*

1.2.1.2 Another paragraph.

See also [1, §3].

2 Formal proof of Cantor's theorem

Cantor's Theorem states that there is no surjection from a set to its powerset. The proof works by diagonalization. E.g. see

- <http://mathworld.wolfram.com/CantorDiagonalMethod.html>
- https://en.wikipedia.org/wiki/Cantor's_diagonal_argument

theorem *Cantor*: $\nexists f :: 'a \Rightarrow 'a \text{ set}. \forall A. \exists x. A = f x$

proof

assume $\exists f :: 'a \Rightarrow 'a \text{ set}. \forall A. \exists x. A = f x$

then obtain $f :: 'a \Rightarrow 'a \text{ set}$ **where** $*$: $\forall A. \exists x. A = f x$..

let $?D = \{x. x \notin f x\}$

from $*$ **obtain** a **where** $?D = f a$ **by** *blast*

moreover have $a \in ?D \longleftrightarrow a \notin f a$ **by** *blast*

ultimately show *False* **by** *blast*

qed



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42nd Conference on Very Important Topics (CVIT 2016).
Editors: John Q. Open and Joan R. Access; Article No. 23; pp. 23:1–23:2



Leibniz International Proceedings in Informatics
Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

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