

# 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

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## 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](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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## 2.1 *Lorem ipsum dolor*

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### References

- 1 Makarius Wenzel. *The Isabelle System Manual*. <https://isabelle.in.tum.de/doc/system.pdf>.