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.

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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 *Document.foo*

definition *bar* = *False* — side remark on *Document.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*: $\nexists f :: 'a \Rightarrow 'a\ set.\ \forall A.\ \exists x.\ A = f\ x$
proof
  assume $\exists f :: 'a \Rightarrow 'a\ set.\ \forall A.\ \exists x.\ A = f\ x$
  then obtain $f :: 'a \Rightarrow 'a\ set$ **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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References

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