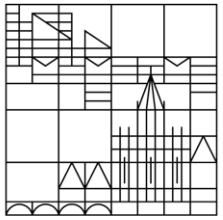
Formalized Mathematical Content

In Lecture Notes on Modelling and Analysis

Universität Konstanz

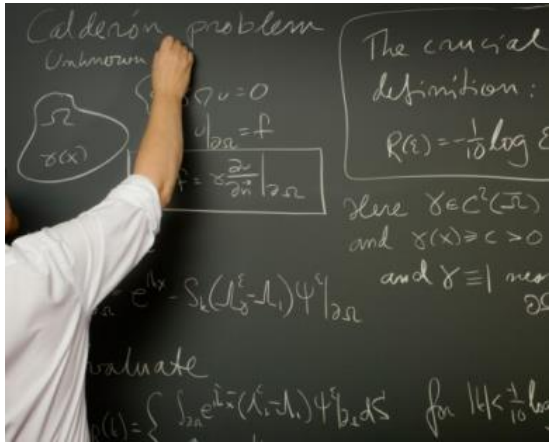


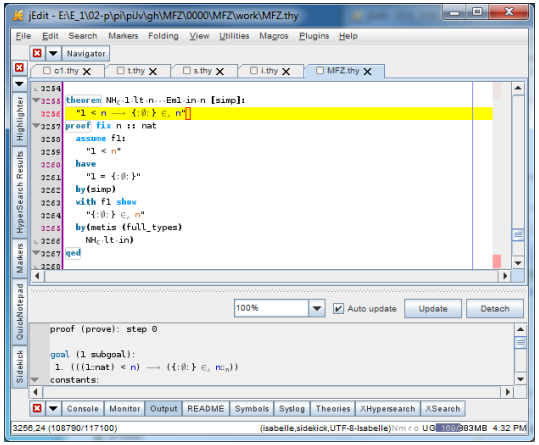
Michael Junk

Sebastian Sahli

Stefan Hölle

The Problem:



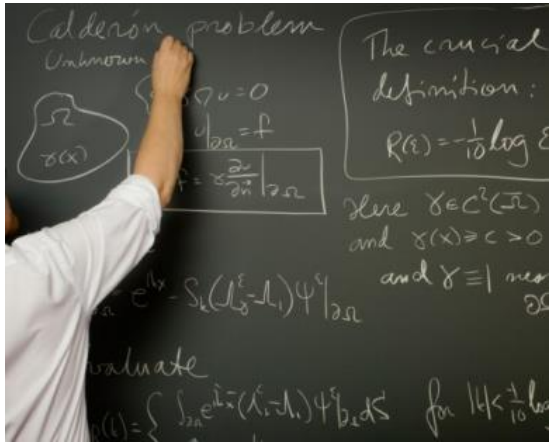


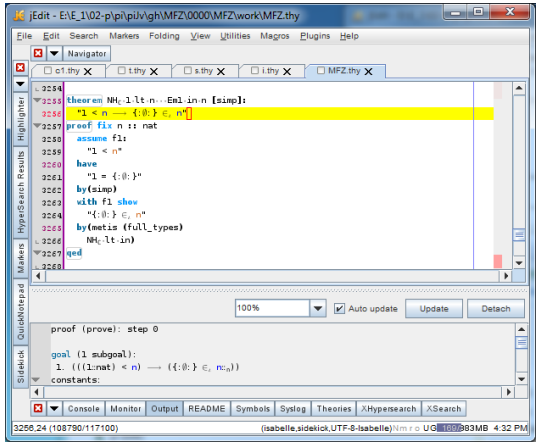
math users

formal math

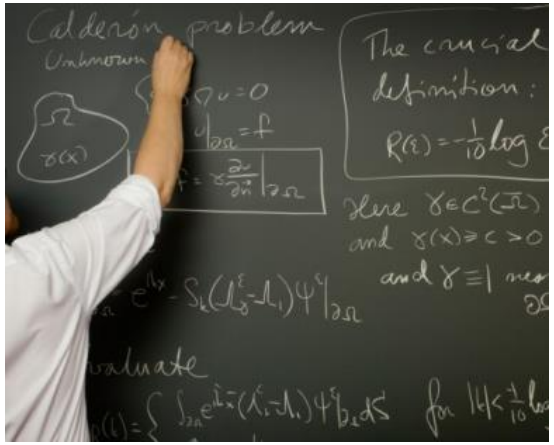
math

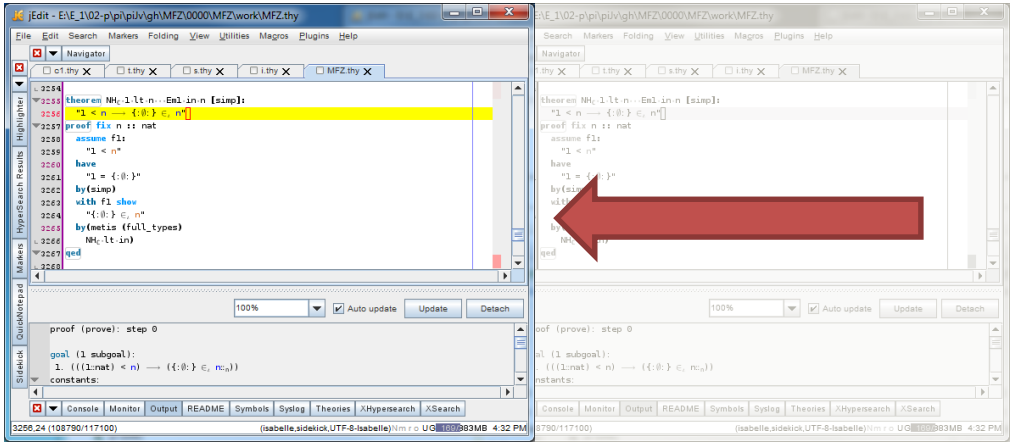
One approach:





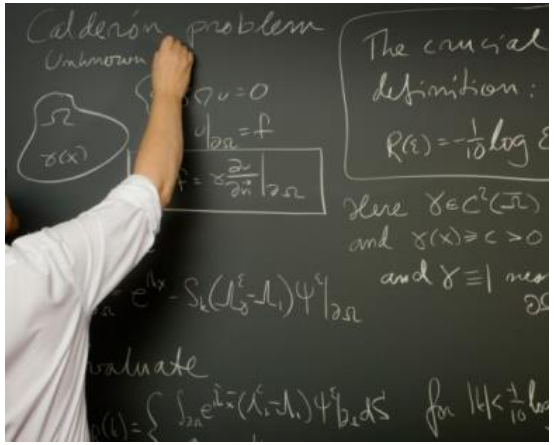
One approach:

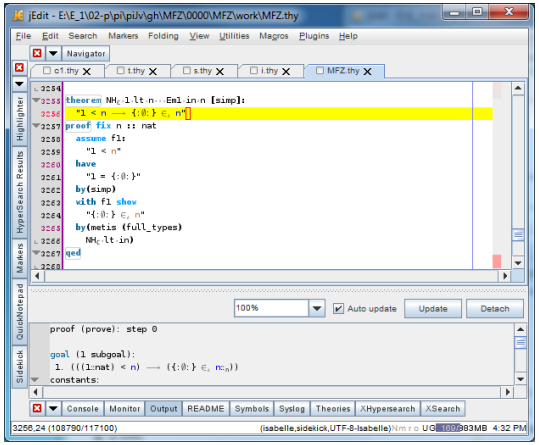


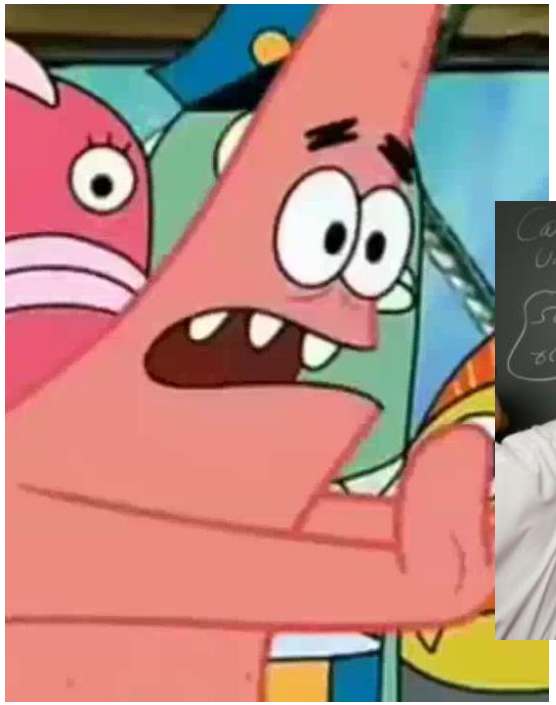


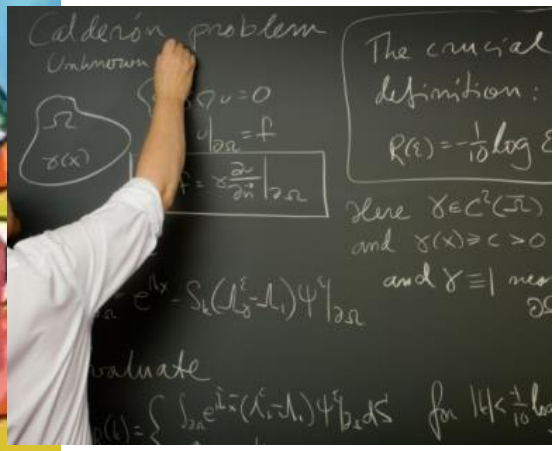
Pushing formal mathematics towards the user

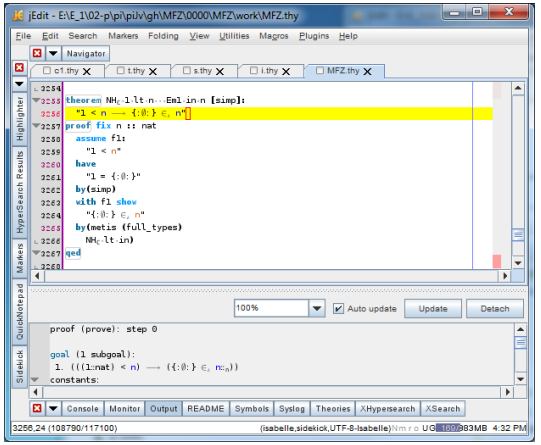
Our approach:

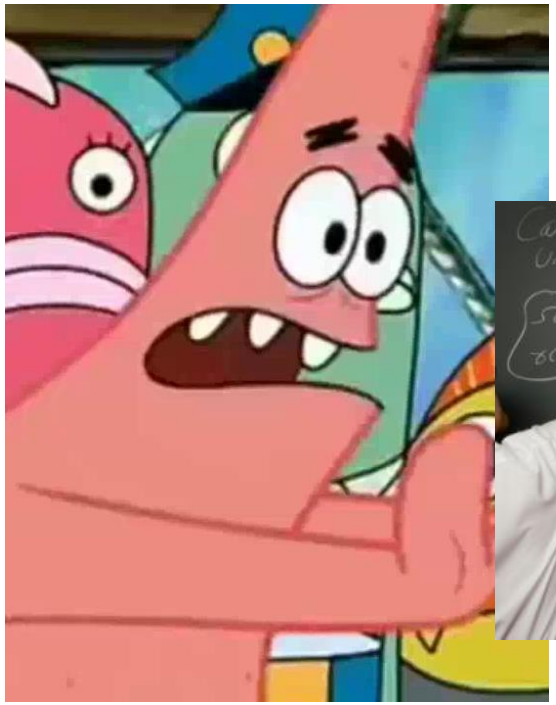


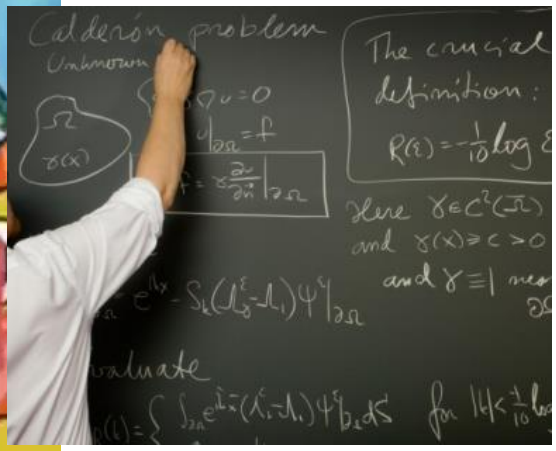


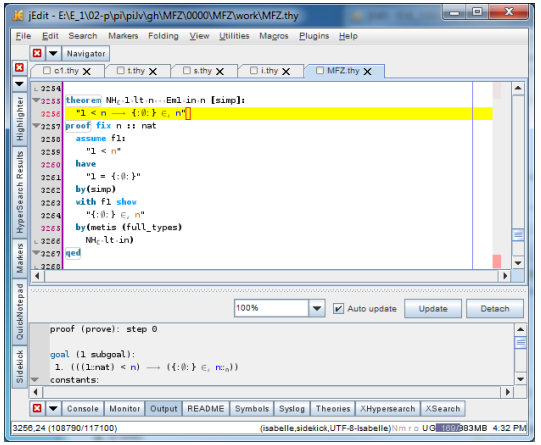



Calderón problem
The crucial definition:
Here
and
and
Evaluate

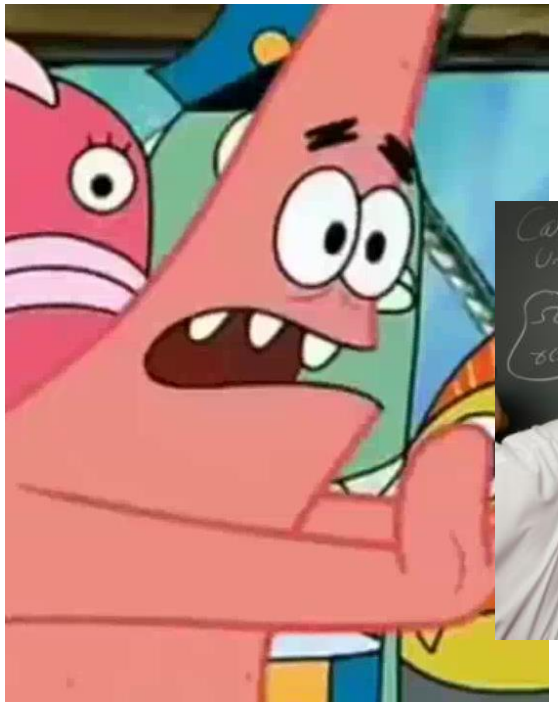

jEdit - E:\E_1\02-p\pi\piJv\gh\MFZ\0000\MFZ\work\MFZ.thy
File Edit Search Markers Folding View Utilities Macros Plugins Help
Navigator
MFZ.thy
theorem NH_c_l_lt_n_..._Eml_in_n [simp]:
proof fix n :: nat
assume f1:
have
by(simp)
with f1 show
by(metis (full_types)
qed
Auto update
Update
Detach
proof (prove): step 0
goal (1 subgoal):
constants:
Console
Monitor
Output
README
Symbols
Syslog
Theories
XHyperSearch
XSearch

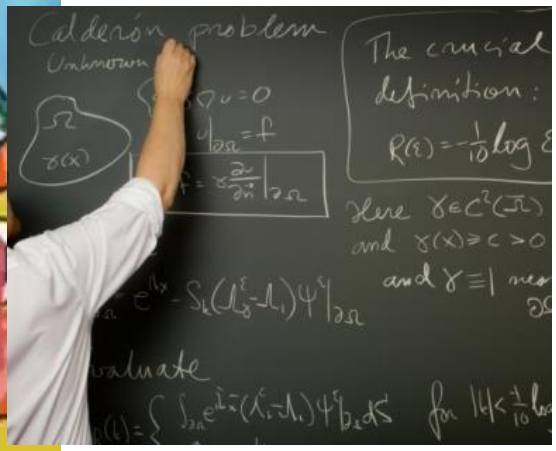


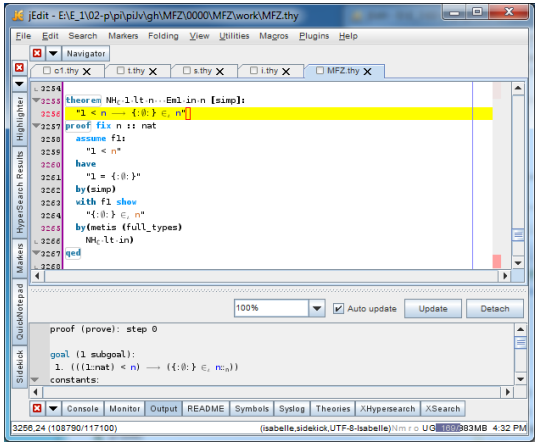

Calderón problem
The crucial definition:
Here
and
and
Evaluate


jEdit - E:\E_1\02-p\pi\pijv\gh\MFZ\0000\MFZ\work\MFZ.thy
File Edit Search Markers Folding View Utilities Macros Plugins Help
Navigator
c1.thy
t.thy
s.thy
i.thy
MFZ.thy
theorem NH_c_1_lt_n_⟷_Eml_in_n [simp]:
"1 < n ⟷ {:𝕆:} ∈ n"
proof fix n :: nat
assume f1:
"1 < n"
have
"1 = {:𝕆:}"
by(simp)
with f1 show
"{:𝕆:} ∈ n"
by(metis (full_types)
NH_c_lt_in)
qed
Highlighter
HyperSearch Results
Markers
QuickNotepad
Sidekick
100%
Auto update
Update
Detach
proof (prove): step 0
goal (1 subgoal):
1. (((1::nat) < n) ⟶ ({:𝕆:} ∈ n::_n))
constants:
Console
Monitor
Output
README
Symbols
Syslog
Theories
XHyperSearch
XSearch
3256,24 (108790/117100)
(isabelle,sidekick,UTF-8-Isabelle)
383MB 4:32 PM

How?







How? … by changing undergraduate courses!