

*ISAC* Design Documents

**Usecases**

including System Views and Testcases

The *ISAC*-Team

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*Revision*

# Contents

# Part I

## Usecases

This part of the document serves the following purposes: it

1. relates the isac-docu to the code and vice versa: i.e. the use cases to the test cases (JUnit tests, etc.). For that reason the code uses exactly the complete labels within this document, e.g. “`\label{UC:cas-input}`”.
2. documents internal discussions about crucial design questions during the early design phases
3. establishes data for test cases at the end of the implementation phase
4. provides for entry-points to understand *ISAC* for colleagues newly joining the *ISAC*-team.

Thus for the most important usecases there are more details (including interaction diagrams) and testdata in the software design document (SDD), part ??: each testcase is based on a usecase described here.

*All* these details in the SDD are referenced at the respective usecases below and presented in the subsequent part ??.

# Chapter 1

## Visit an *ISAC* site

The 'user' in this chapter is a visitor.

### **UC 1.0.0.1** *The contents of an ISAC site is inspected using a standard browser*

Anybody dropping into an *ISAC*-site more or less intentionally first wants to know what is offered at this site. The visitor may never had heard anything about *ISAC*, and thus should get information on the purpose and the features *ISAC*. Or somebody may want to know in detail about the contents of the knowledge base and/or the example collection of this particular site.

1. The Visitor is reaching the entry-page of the *ISAC*-site. This site contains a welcome-message from the host of the system as well as a brief summary of its content. The entry-page acts as doorway for
  - the *ISAC*-knowledge (i.e. decorated knowledge including explanations) as it contains links to the problems, methods and theories
  - the example collection
2. The user might select one of the three main branches of the knowledge base (Fig.?? on p.??) and browse them as described in ??, or jump directly to an example-collection.

### 1.1 Browse the knowledge:

*ISAC*'s mathematics knowledge is separated from the knowledge interpreter (the 'mathematics engine'). The knowledge is described such that it can be read by human users *and* can be interpreted by the mathematics engine in *one and the same* format. Thus the knowledge base is one entry point of interactive learning (besides the example collection).

For technical reasons we subsume the example collection here: Handling and representation of knowledge and examples has been unified so far. There are

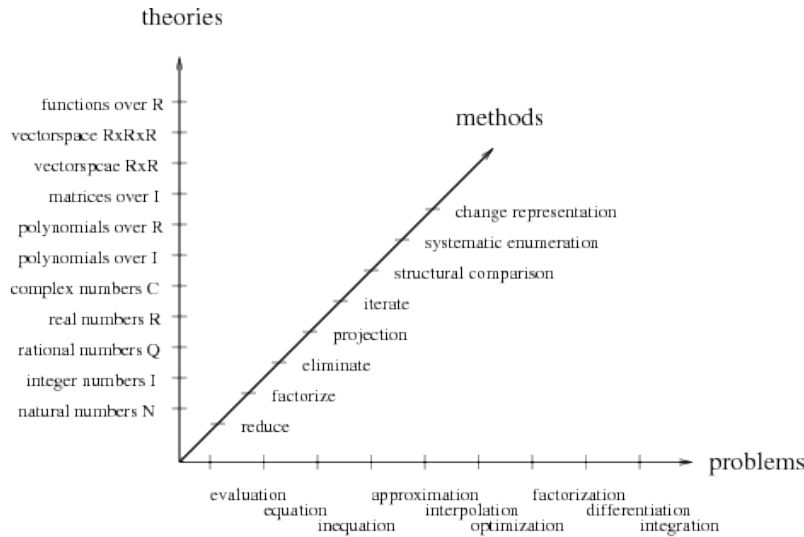


Figure 1.1: The 3 dimensions of *ISACs* knowledge base

several terms concerning knowledge, see [?] 'List of Terms Used in the *ISAC* Project': knowledge, decorated knowledge (i.e. knowledge plus explanations), KE-store (i.e. decorated knowledge plus example collection).

#### UC 1.1.0.2 *User browses through the knowledge hierarchies*

A student uses a WEB-Browser to gain an overview of *ISACs* problem hierarchy, for instance, see p.??.

1. The user decides for 'problems' (and not for theories, methods or examples; this decision may be put on another KE-store browser or on a worksheet).
2. The browser-window of the problem-browser shows the root problem
3. The browser-window of the problem-browser shows the hierarchy of problems (at least the next lower level of problems).
4. After selecting one of the problems this one is displayed, and all the explanations contained are shown. (These explanations are optional informations which have been added by a course designer, depending on the special course: typical examples, illustrations etc).
5. Eventually the navigation tool for the hierarchy is updated (nodes can be expanded and collapsed when needed)

*Further navigational help:* If the user has changed the page with the contents of a problem, the survey on the hierarchy might not be up to date. Thus there is button 'where am I ?' showing the position of the current page within the hierarchy.

## 1.2 Browse the example collection

*ISAC* is a web-based system as the mathematics knowledge (Isabelle theories, problems, methods) and the example-collection of an *ISAC*-site can be browsed using a standard web-browser — if the owner of the *ISAC*-site is willing to do so (and there are many reasons to make the offers of a specific site visible to the public, at least a part of it).

The math power of an *ISAC*-site actually can be experienced by doing the calculations given in the respective example-collection. However, doing the calculation in the interactive way (which is *ISAC*'s outstanding feature !) requires software which is too complex to be handled by the Applet-technology available presently; for interactive calculation you need to download the *ISAC* Tutoring System.

But one may want to get at least a glimpse of the math power of an *ISAC*-site, or one might be interested only in the completed calculation, not in the interactive construction of a calculation: this for is the *ISAC* Web Reader — see <http://www.ist.tugraz.at/projects/isac/www/content/isac-reader.html>.

### UC 1.2.0.3 *Select and display a single example*

The user selects an example from the example-hierarchy (i.e. a leaf of the tree), and the description (text, figure, formulae) of the example is displayed.

### UC 1.2.0.4 *Execute a single example*

Executes an example displayed in the example browser by hitting some hotspot (preferably the number uniquely identifying each example).

### UC 1.2.0.5 *Select and display a page of examples*

Select a page of examples like in a textbook.

Hint (to be deleted from here!): Each node of the example hierarchy has a `DESCRIPTION` which can be used for a page of examples. Design such that a page is a node exactly one level above the leaves, and the leaves are exactly the examples contained in the respective page. The difference and challenge is with the following ...

### UC 1.2.0.6 *Execute an example from a page*

Execute an example (preferably by clicking the number identifying the example) contained in a page displayed on the example browser.

The last usecase does not address the visitor, but an example author. It is kept here until other UCs for the example author come up.

### UC 1.2.0.7 *An author selects a single example*

This extends UC.?? by displaying the formalizations of the example, which is hidden from the learner.