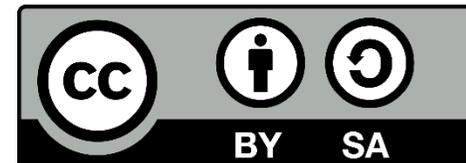


JabRef as BibTeX-based literature management software

Oliver Kopp
JabRef e. V.



Agenda

- 1 **JabRef: A GUI for BibTeX-Based Reference Management**
- 2 **Features of JabRef**
- 3 **Using JabRef as a Study Subject in Software Engineering Education**
- 4 **Summary**

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- 1** **JabRef: A GUI for BibTeX-Based Reference Management**
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JabRef: A GUI for BibTeX-Based Reference Management

The screenshot displays the JabRef application window titled "jabref-authors.bib - JabRef". The interface includes a menu bar (File, Edit, Library, Quality, Lookup, Tools, View, Options, Help), a toolbar with icons for file operations and search, and a search bar. On the left, there is a sidebar with "Web search" and "Groups" sections. The "Groups" section shows "All entries" with 210 items, "By status" with 13 items, "Last read" with 2 items, "Skimmed" with 2 items, "To be read" with 9 items, "By rating" with 36 items, "For Project X" with 2 items, "For teaching" with 9 items, and "My papers" with 8 items. The main area shows a list of references with columns for "Entry...", "Author/Editor", and "Title". The selected entry is "Arithmetic" by Oscar Gustafsson and Lars Wanhammar, from the "Handbook of Signal Processing Systems" (2013). The bottom panel shows the "InCollection" details for this entry, including the author, title, booktitle, date, and citation key "GustafssonWanhammar2013".

Entry...	Author/Editor	Title
Article	Garrido et al.	CORDIC II: A New Improved CORDIC Algorithm
InProc...	Gustafsson and Johansson	Decimation filters for high-speed delta-sigma modulators with passba
InProc...	Johansson and Gustafsson	Filter-bank based all-digital channelizers and aggregators for multi-sta
InProc...	Alam and Gustafsson	Generalized division-free architecture and compact memory structure i
InProc...	Ingemarsson and Gustafsson	On fixed-point implementation of symmetric matrix inversion
InProc...	Johansson and Gustafsson	On frequency-domain implementation of digital FIR filters
Article	Alam and Gustafsson	Design of Finite Word Length Linear-Phase FIR Filters in the Logarithm
InProc...	Sadeghifar et al.	Linear programming design of semi-digital FIR filter and $\Sigma\Delta$ modulator
Article	Garrido et al.	Low-Complexity Multiplierless Constant Rotators Based on Combined
Article	Afzal et al.	Reducing Complexity and Power of Digital Multibit Error-Feedback AS

InCollection (GustafssonWanhammar2013)
Gustafsson, Oscar / Wanhammar, Lars
Arithmetic
2013
Bhattacharyya, Shuvra S. / Deprettere, Ed F. /
Leupers, Rainer / Takala, Jarmo (Eds.)
Handbook of Signal Processing Systems

JabRef's Core Principle: Utilizing BibTeX as Internal Data Format

BIBTEX

```
@Article{Steinmacher2015,  
  author    = {Igor Steinmacher and others},  
  ...  
}
```



- `public enum StandardEntryType implements EntryType {
 Article("Article"), ...}`
- `public enum StandardField implements Field {
 AUTHOR("author", FieldProperty.PERSON_NAMES), ...}`



- `private ObservableMap<Field, String> fields =
 FXCollections.observableMap(new ConcurrentHashMap<>());`

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Integrated Web Search

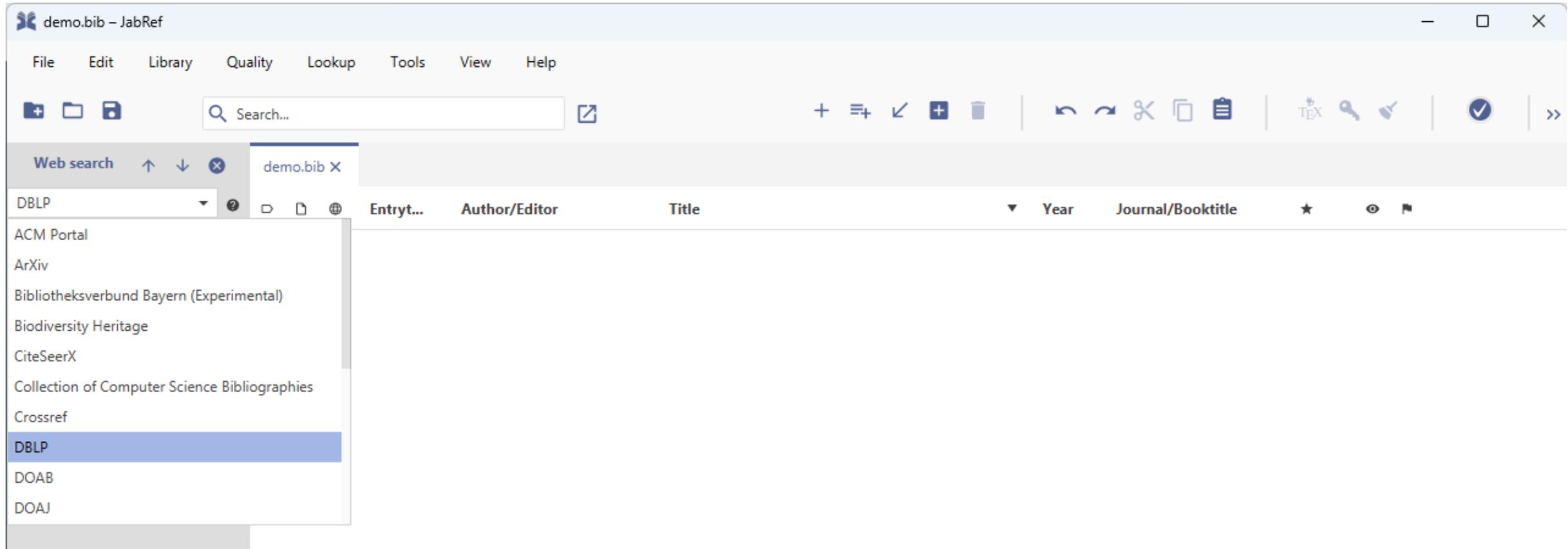
The screenshot shows the JabRef application window titled "demo.bib - JabRef". The menu bar includes File, Edit, Library, Quality, Lookup, Tools, View, and Help. The toolbar contains various icons for file operations and editing. A search bar is visible with the text "Search...".

The main window displays a table with the following columns: Entry..., Author/Editor, Title, Year, and Journal/Booktitle. The table is currently empty.

A sidebar on the left is open, showing a "Web search" panel. The search term "jabref" is entered in the search bar. The results are filtered to "All entries", which shows 0 results.

Entry...	Author/Editor	Title	Year	Journal/Booktitle
----------	---------------	-------	------	-------------------

Integrated Web Search: Access to Multiple Catalogues



The screenshot shows the JabRef application window titled "demo.bib - JabRef". The menu bar includes File, Edit, Library, Quality, Lookup, Tools, View, and Help. Below the menu bar is a toolbar with various icons for file operations and editing. A search bar is located in the top left of the main area. The "Web search" dropdown menu is open, showing a list of search engines. The "DBLP" option is currently selected and highlighted in blue. The main area of the application displays a table with columns: Entry..., Author/Editor, Title, Year, and Journal/Booktitle. The table is currently empty.

Entry...	Author/Editor	Title	Year	Journal/Booktitle
----------	---------------	-------	------	-------------------

Illustration: Integrated Web Search Results

The screenshot shows a window titled "DBLP" with a standard Windows-style title bar (minimize, maximize, close). The main content area is titled "Select the entries to be imported:" and contains a list of three search results. Each result is a horizontal row with a checkbox on the left, the title and year in the middle, and a plus sign icon on the right. The first row is highlighted in blue. Below the list are several empty rows. At the bottom of the window, there are three buttons: "Select all new entries", "Select all entries", and "Unselect all". To the right of these buttons, the text "Total items found: 3" and "Selected items: 1" is displayed. Below that is a dropdown menu labeled "Library to import into" with "demo.bib" selected. A checked checkbox labeled "Download linked online files" is also present. At the bottom right, there are two buttons: "Import entries" and "Cancel".

Select the entries to be imported:

- Analyzing the Importance of JabRef Features from the User Perspective**
2019
Martin K. Simon and Linus W. Dietz and Tobias Diez and Oliver Kopp
- Integration of the Scientific Recommender System Mr. DLib into the Reference Manager JabRef**
2017
Stefan P. Feyer and Sophie Siebert and Bela Gipp and Akiko Aizawa and Jöran Beel
- The relationship of code churn and architectural violations in the open source software JabRef**
2017
Tobias Olsson and Morgan Ericsson and Anna Wingkvist

Select all new entries Select all entries Unselect all

Library to import into: demo.bib

Download linked online files

Total items found: 3
Selected items: 1

Import entries Cancel

Illustration: Integrated Web Search Result

The screenshot shows the JabRef application window titled "demo.bib - JabRef". The menu bar includes File, Edit, Library, Quality, Lookup, Tools, View, and Help. A search bar at the top contains "Search...". Below the menu bar, there are icons for adding files, folders, and a search icon. A "Web search" panel is open, showing a dropdown menu set to "DBLP" and a search input field containing "jabref". The search results are displayed in a table with columns: Entry..., Author/Editor, Title, Year, and Journal/Booktitle. One result is highlighted:

Entry...	Author/Editor	Title	Year	Journal/Booktitle
InProc...	Simon et al.	Analyzing the Importance of JabRef Features from ...	2019	Proceedings of th...

Below the table, there are tabs for "Optional fields", "Other fields", "Comments", "General", "Abstract", "Related articles", "BibTeX source", and "LaTeX Citat". The "BibTeX source" tab is selected, showing the following BibTeX entry:

```
@InProceedings{Simon2019,  
  author   = {Martin K. Simon and Linus W. Dietz and Tobias Diez and Oliver Kopp},  
  booktitle = {Proceedings of the 11th Central European Workshop on Services and their Composition,  
  Bayreuth, Germany, February 14-15, 2019},  
  title    = {Analyzing the Importance of JabRef Features from the User Perspective},  
  year     = {2019},  
  editor   = {Stefan Kolb and Christian Sturm},  
  pages    = {47--54},  
  publisher = {CEUR-WS.org},  
  series   = {{CEUR} Workshop Proceedings},  
  volume   = {2339},  
  bibsource = {dblp computer science bibliography, https://dblp.org},  
  biburl   = {https://dblp.org/rec/conf/zeus/SimonDDK19.bib},  
  url      = {https://ceur-ws.org/Vol-2339/paper10.pdf},  
}
```

Drag and Drop to import a PDF (including meta data)

The image shows two windows side-by-side. The left window is a file explorer showing a directory structure: Start > JabRef > TUG 2023 > demo. It contains a table of files:

Name	Status	Änderungsdatum	Typ	Größe
demo.bib	🔄	13.07.2023 09:28	BibTeX File	1 KB
IST2015.pdf	✅	13.07.2023 09:26	PDF File	673 KB

The right window is the JabRef application titled 'demo.bib - JabRef'. It has a menu bar (File, Edit, Library, Quality, Lookup, Tools, View, Help) and a search bar. Below the search bar, there are several panels: 'Web search' (showing 'demo.bib'), 'DBLP' (showing 'jabref'), and 'Groups' (showing 'All entries'). A search result is displayed in a table:

Entry...	Author/Editor	Title
InProc...	Simon et al.	Analyzing the Importanc

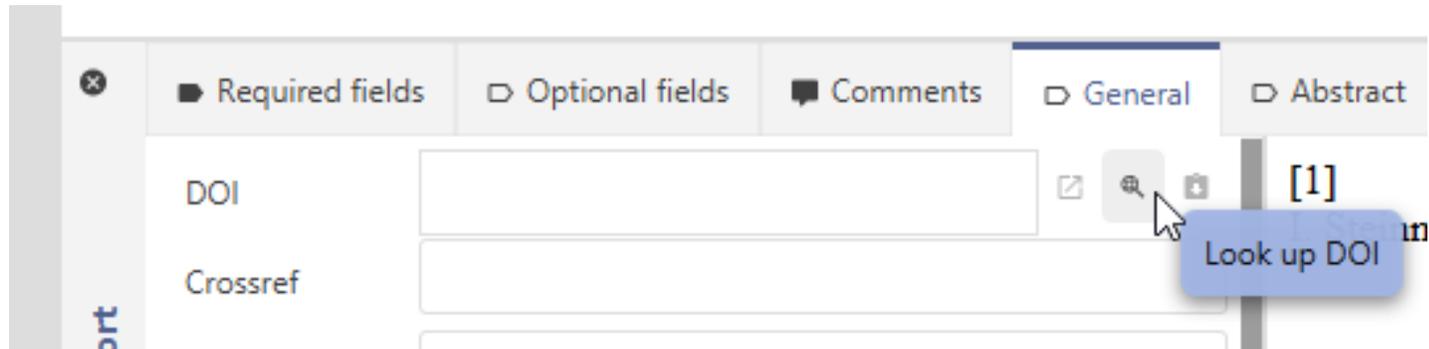
A green arrow points from the 'IST2015.pdf' file in the file explorer to the 'All entries' group in the JabRef application. A mouse cursor is hovering over the 'All entries' group, and a small preview of the PDF document is visible, with a button labeled 'Verschieben' (Move) below it.

Resulting BibTeX

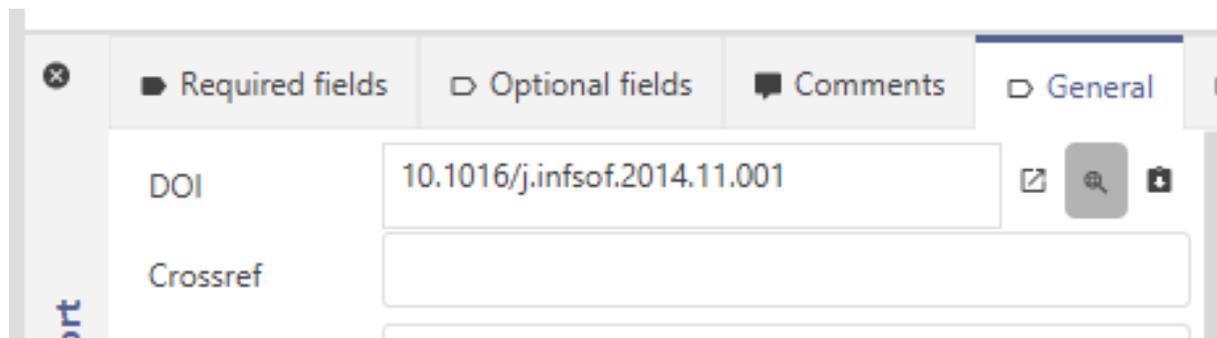
```
@TechReport{Steinmachera2014,  
  author   = {Igor Steinmachera and b and Marco Aurelio Graciotto Silva and Marco Aurelio  
Gerosab and David F. Redmiles},  
  title    = {A systematic literature review on the barriers faced by newcomers to open  
source software projects},  
  year     = {2014},  
  number   = {on},  
  file     = {:IST2015.pdf:PDF},  
  keywords = {Open Source Software, Software Engineering, Newcomers, Beginners, Novices,  
Joining, Contribution, Barriers to Entry, Onboarding, Open Collaboration, Socialization,  
Systematic Literature Review},  
}
```

Cleanup of the BibTeX data: 1) Look up DOI

1. Lookup DOI



2. DOI determined



Cleanup of the BibTeX data: 2) Fetch BibTeX data from DOI

Merge entry with DOI information

← Left → Right | Show Diff | Unified View | Highlight words Highlight characters Only show changed fields

	Original entry	Entry from DOI	Merged Entry
Entrytype	TechReport	TechRepoArticle	Article
Author	Igor Steimachera and b and Marco Aurelio Graciotto Silvaa and Marco Aurelio Gerosab and David F. Redmiles	Igor Steimachera and b and Marco Aurelio Graciotto Silvaa and Marco Aurelio Gerosab and David F. Redmiles	Igor Steimacher and Marco Aurelio Graciotto Silva and Marco Aurelio Gerosa and David F. Redmiles
Citationkey	Steimachera2014	Steimachera_20145	Steimachera2014
File	:IST2015.pdf:PDF		:IST2015.pdf:PDF
Journal		Information and Software Technology	Information and Software Technology
Keywords	Open Source Software, Software Engineering, Newcomers, Beginners, Novices, Joining, Contribution, Barriers to Entry, Onboarding, Open Collaboration, Socialization, Systematic Literature Review		Open Source Software, Software Engineering, Newcomers, Beginners, Novices, Joining, Contribution, Barriers to Entry, Onboarding, Open Collaboration, Socialization, Systematic Literature Review
Month		mar	mar
Number	on		
Pages		67--85	67--85
Publisher		Elsevier (BV)	Elsevier (BV)
Volume		59	59
Year	2014	20145	2015

Merge entries | Cancel

Organizing Entries into Groups

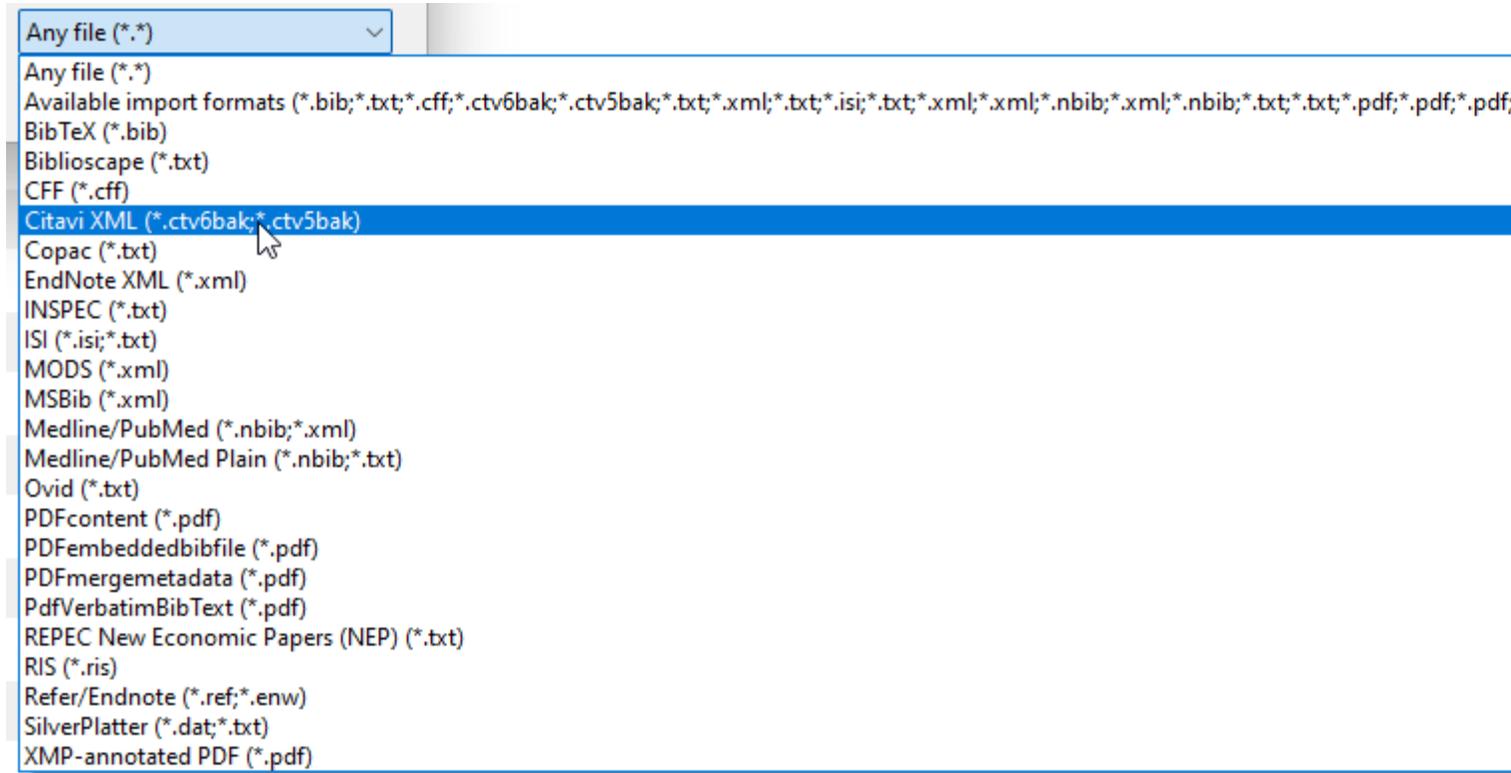
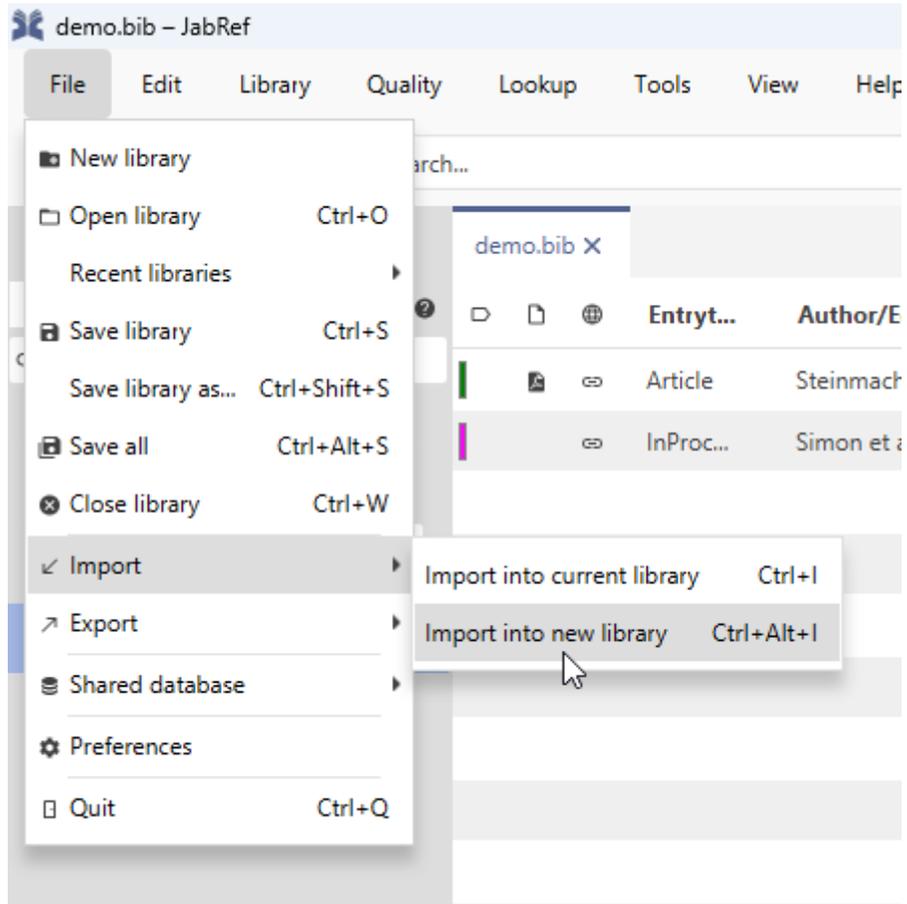
The screenshot shows the JabRef application window titled "demo.bib - JabRef". The interface includes a menu bar (File, Edit, Library, Quality, Lookup, Tools, View, Help), a search bar, and a sidebar with a "Web search" section (DBLP, search for "jabref") and a "Groups" section (All entries: 2, software engineering: 1, jabref: 1). The main area displays a table of entries:

Entry...	Author/Editor	Title	Year	Journal/Book
Article	Steinmacher et al.	A systematic literature review on the barriers faced...	2015	Information a
InProc...	Simon et al.	Analyzing the Importance of JabRef Features from ...	2019	Proceedings c

The selected entry is shown in a detailed view below the table, displaying its BibTeX source code:

```
@InProceedings{Simon2019,  
  author   = {Martin K. Simon and Linus W. Dietz and Tobias Diez and Oliver Kopp},  
  booktitle = {Proceedings of the 11th Central European Workshop on Services and their Composition,  
              Bayreuth, Germany, February 14-15, 2019},  
  title    = {Analyzing the Importance of JabRef Features from the User Perspective},  
  year     = {2019},  
  editor   = {Stefan Kolb and Christian Sturm},  
  pages    = {47--54},  
  publisher = {CEUR-WS.org},  
  series   = {{CEUR} Workshop Proceedings},  
  volume   = {2339},  
  bibsource = {dblp computer science bibliography, https://dblp.org},  
  biburl   = {https://dblp.org/rec/conf/zeus/SimonDDK19.bib},  
  groups   = {jabref},  
  url      = {https://ceur-ws.org/Vol-2339/paper10.pdf},  
}
```

Converting and Importing Data from Various Formats and Tools



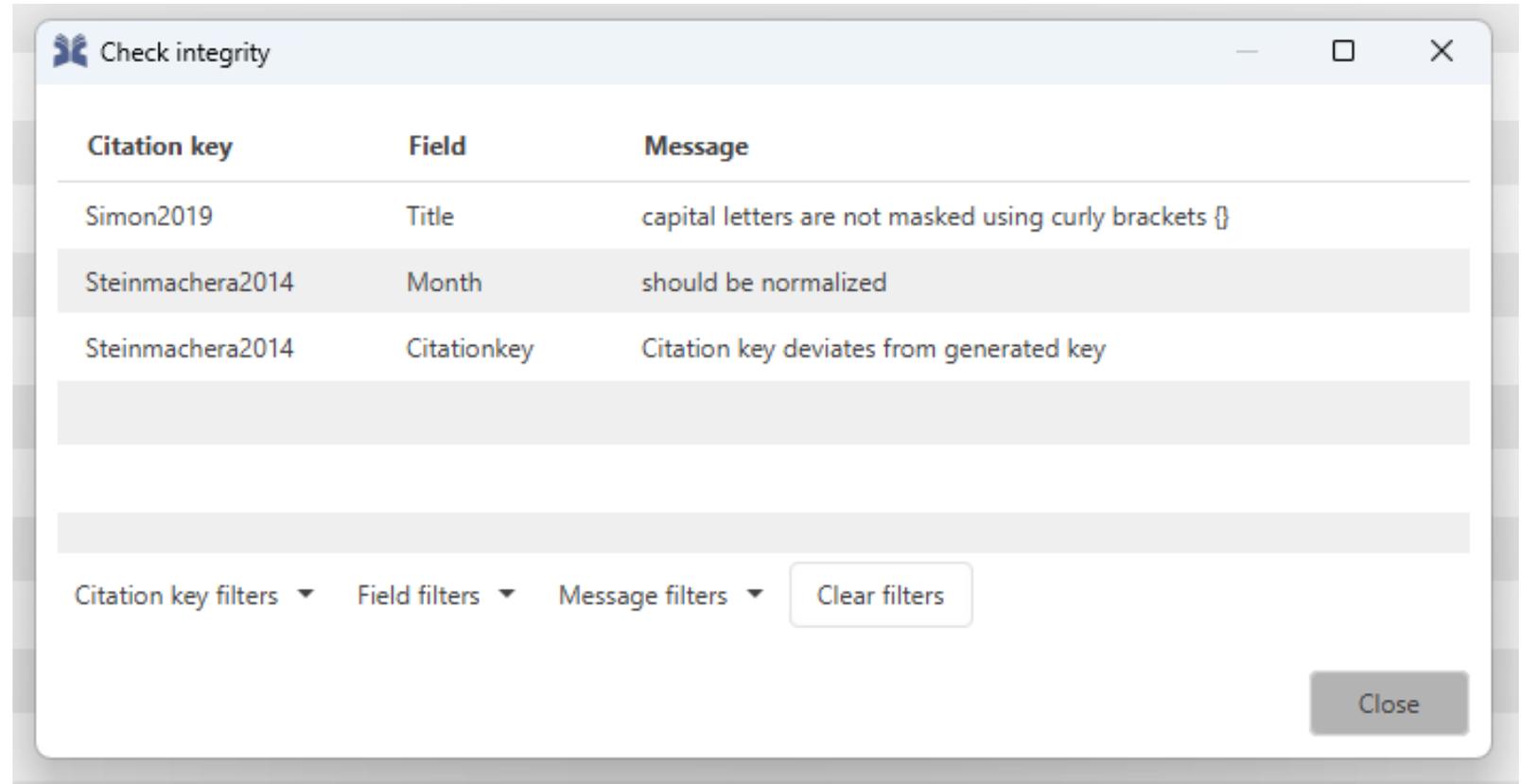
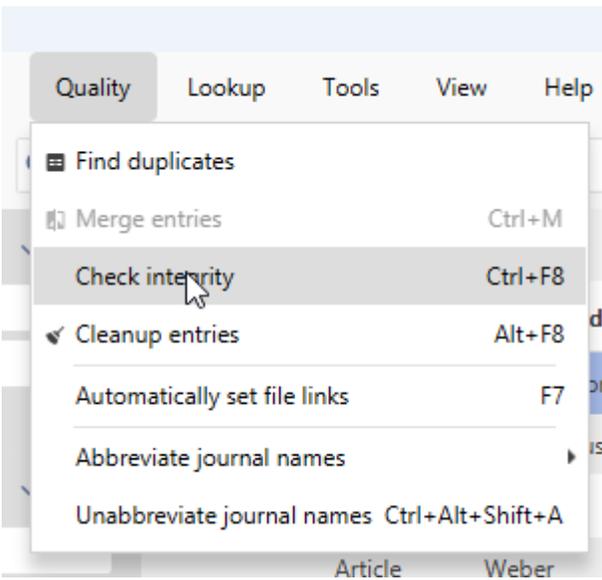
Result: Complete Import of All Entries as a New Library

The screenshot shows the JabRef application window titled "untitled* - JabRef". The menu bar includes File, Edit, Library, Quality, Lookup, Tools, View, and Help. Below the menu bar is a search bar with the text "Search...".

The main window displays a table of imported entries. The table has columns for Entry type, Author/Editor, Title, Year, and Journal/Booktitle. The entries are sorted by year. The "All entries" group is selected in the left sidebar, showing 99 entries.

Entry...	Author/Editor	Title	Year	Journal/Booktitle	★
Book	Ross-Larson	Writing for the Information Age	2002		★★★★★
Article	Niederhauser et al.	Writing a Research Paper with Citavi 5			★★★★★
Article	Bruce	Workplace experiences of information literacy	1999		★★★★★
Article	Weber	Wissenschaft als Beruf [1919]			★★★★★
Article	Kingsley et al.	Why not just Google it? An assessment of informat...	2011		★★★★★
Book	Sharpless Smith	Web Based Instruction	2010		★★★★★
Book	Staw	Unstuck	2005		★★★★★
Article	Weaver and Rhodes	Tracking Information Literacy Competencies throu...	2014		★★★★★

Conducting a Quality Check

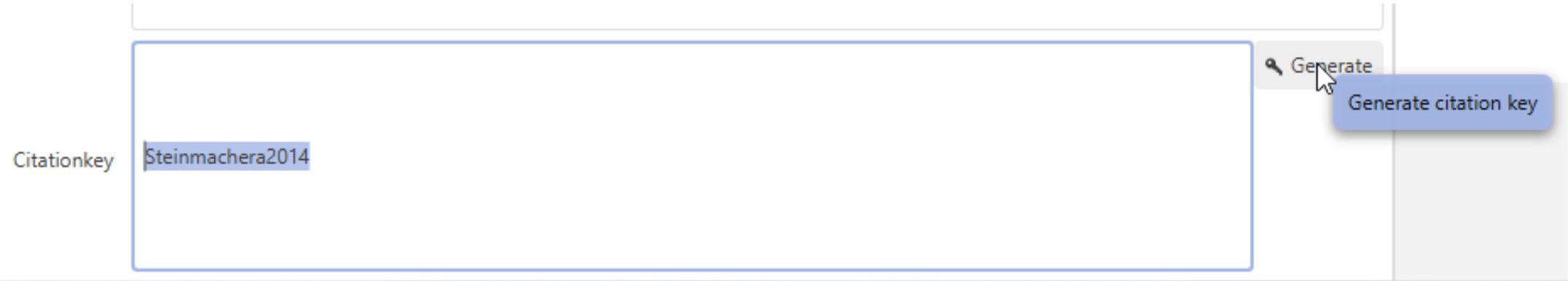


Manually Correcting the Citation Key

Citationkey Steinmachera2014

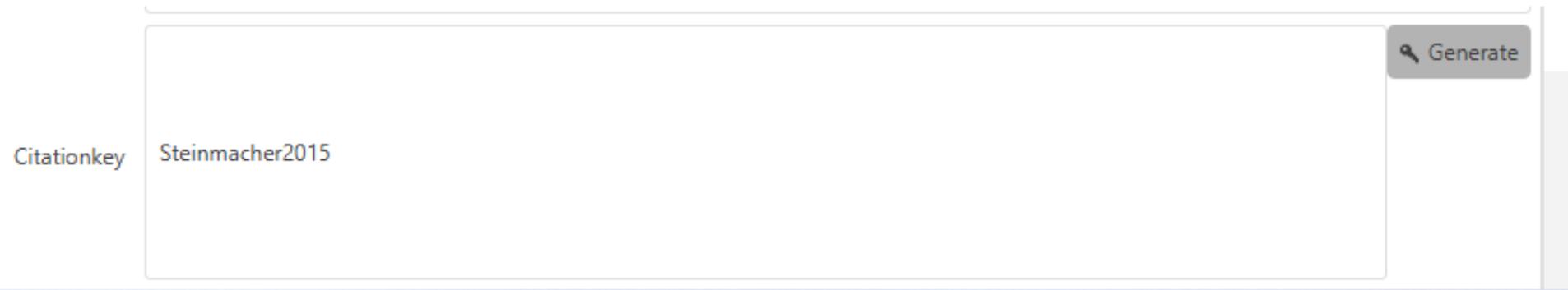
Generate

Generate citation key

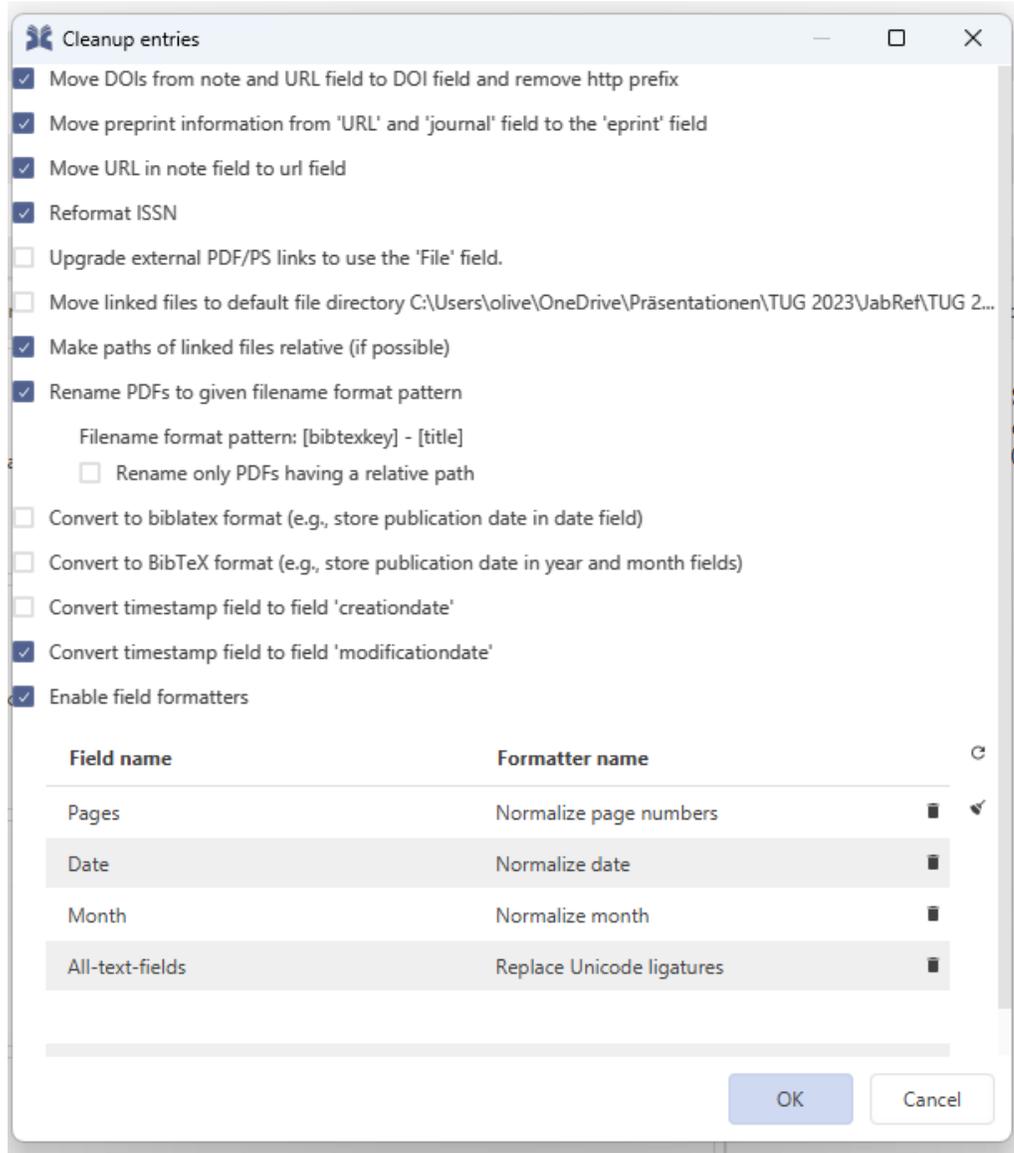
A screenshot of a web form. On the left, the label "Citationkey" is followed by a text input field containing "Steinmachera2014". To the right of the input field is a grey button with a magnifying glass icon and the text "Generate". A blue tooltip box with rounded corners is positioned over the "Generate" button, containing the text "Generate citation key".

Citationkey Steinmacher2015

Generate

A screenshot of a web form. On the left, the label "Citationkey" is followed by a text input field containing "Steinmacher2015". To the right of the input field is a grey button with a magnifying glass icon and the text "Generate".

Automatic Fixing



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JabRef Open Source State as of 2023-07-13

- **GitHub Stars:** 3,200
- **Commits:** 18,799
- **Releases:** 101
- **Contributors:** 531 in total (2022: 431; 2018: 140)
- **Closed Pull Requests:** 6,119
- **Closed Issues:** 3,548
- **Main Developers:** 8 (participating as a freetime project)
- **Lines of Code:** 52k
- **Test Coverage:** 41%

Using JabRef as a Study Subject in Software Engineering Education

■ Observation

- Teaching programming starts with simple projects
- Teaching programming ends with large projects
- Missing: Medium-sized project with simple functionality

■ Idea of using JabRef as study subject

- Opportunity of using a real-world tooling and code base
- Sustainability of students' work: Exercise incorporated in a real-world product
- Opportunity to raise visibility and recognition for students and research groups

Board for Empowering Students to Select Issues

JabRef / Projects / Candidates for University Projects

Candidates for University Projects

List with Details | Size of Project | Status | + New View

status:"free to take"

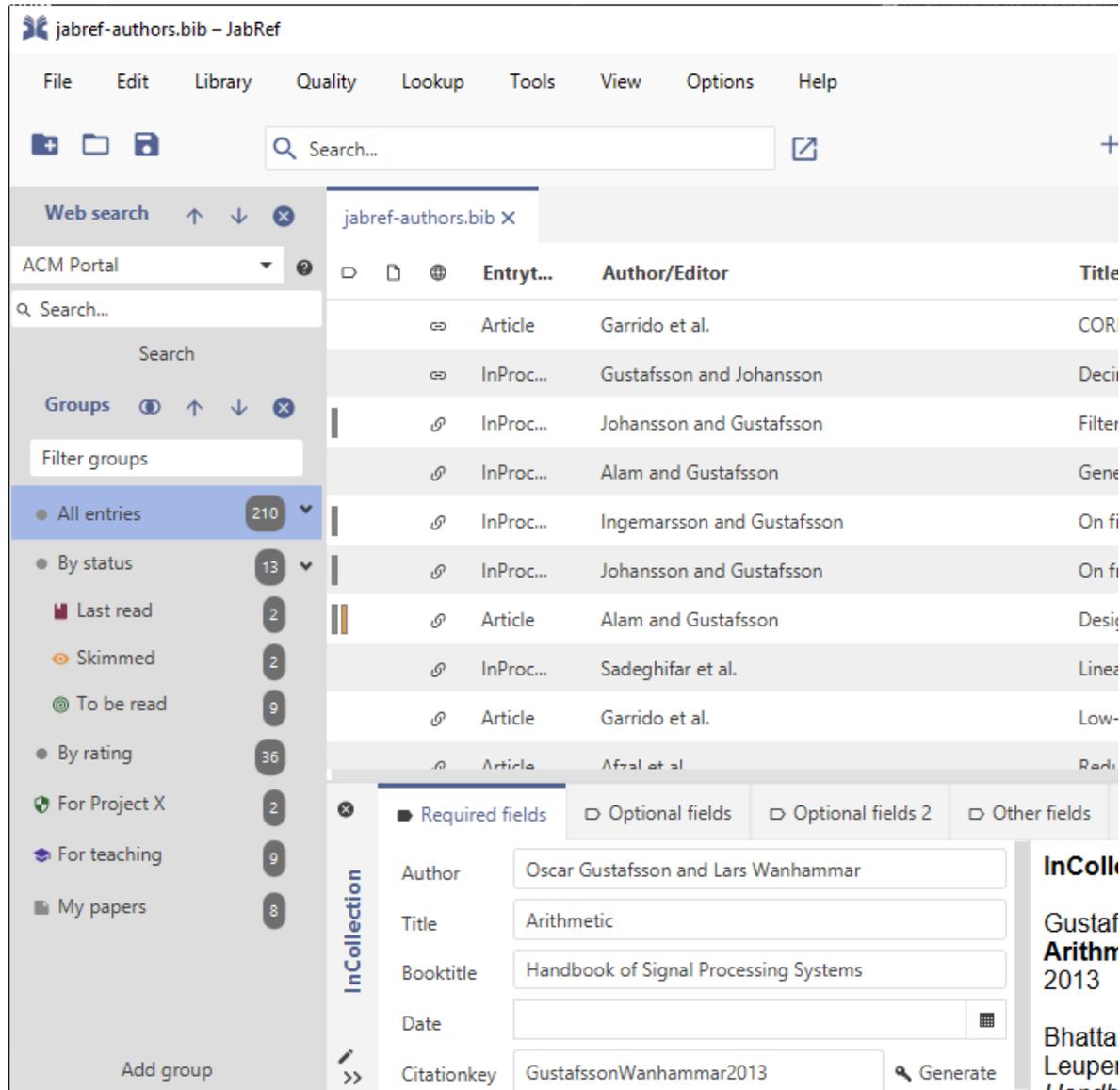
Title	Size of Project	Main focus	Issue understanding effort	Implementation effort	Testing effort
1 Integrate check-bib-for-predatory #348	Small	logic + UI	low	medium	low
2 Add support for scite.ai #375	Small	logic + UI	low	high	medium
3 Add abbreviations from wiki data #49	Small	logic	medium	low	low
4 Rewrite code of CitaviImporter to avoid JAXBContext #9539	Small	logic	medium	medium	low
5 External changes should show content #624	Small	logic	medium	low	low

<https://github.com/orgs/JabRef/projects/3/views/3>

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JabRef: A User-friendly, Graphical Tool for BibTeX-based Literature Management



■ Collect

- Perform online searches
- Extract information from PDF files

■ Organize

- Facilitate grouping of entries
- Enable data correction and enhancement

■ Share

- Synchronize and share .bib files using git