Bibcheck v1.0 (2021/09/23)

Bibcheck is a Lua-based script that checks each \bibitem of a LaTeX file (tex) against MathSciNet and zbMATH, and writes all checked entries into a BibTeX file (bib). — Questions? Contact Simon Winter (winter@ems.press)

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1 Installation

1.1 Install Lua on Windows (version 5.1 or higher)

1. Download `LuaForWindows_v5.1.5-52.exe` (27.8 MB) at https://github.com/rjpcomputing/luaforwindows/releases/tag/v5.1.5-52
2. Run the exe file and always click 'accept/next'.

1.2 Install WGet on Windows (version 1.14 or higher)

1. Download from https://eternallybored.org/misc/wget/ the exe (!) file of Version 1.21 (32-bit or 64-bit).
2. Copy `wget.exe` to e.g. `C:\Program Files (x86)\wget-1.21.1-1-win64\` or any other folder.
3. Add WGet to the Windows PATH:
   (a) Open the Start Search, type in 'env' and choose 'Edit the system environment variables'.
   (b) Click the 'Environment Variables' button.
   (c) Under 'System Variables' find the row with 'Path' in the first column and click edit.
   (d) Click 'New' and type in the new path, e.g. `C:\Program Files (x86)\wget-1.21.1-1-win64`
   (e) Dismiss all of the dialogs by choosing OK. Your changes are saved.
4. To check if the installation was successful, open a command terminal (by typing 'cmd' in the search menu) and type

```
wget --no-check-certificate -qO- "https://mathscinet.ams.org/mathscinet-mref?
dataType=bibtex&ref=Whitehead, On 2-spheres in 3-manifolds, Bull. Amer. Math."
```

   without space or line break after the question mark.

1.3 Install Bibcheck

1. Create a new folder for Bibcheck. *The whole path must not contain any spaces!*
2. Copy all four Lua files into the Bibcheck folder: `bibcheck.lua`, `config.lua`, `dkjson.lua`, `functions.lua`

1.4 Note for Mac users

1. To install Lua and WGet, Mac users should use the package manager Homebrew.
2. See Method #1 on how to install Homebrew and WGet.
3. After installing Lua, the two Lua libraries 'LuaFileSystem' and 'Penlight' might be missing. Then run:

```
brew install luarocks
luarocks install luafilesystem
luarocks install penlight
```

2 How to use Bibcheck

2.1 Case 1: Your tex file contains \bibitem's

1. Open the Command Terminal, go to the paper's directory and write

   `lua BIBCHECKPATH\bibcheck.lua MAINFILE.tex BSTFILENAME`

   e.g. on Windows:

   `lua C:\tools\bibcheck\bibcheck.lua main.tex emss`

   Note: *The whole path must not contain any spaces!*

2. The script will run for a few seconds. What happens is the following: Every `\bibitem` in `main.tex` is compared with MathSciNet.
   - If there is a match, this **match** is written into a BibTeX file.
   - If there is no match, the **original entry** is written into the BibTeX file.
3. Next, an automatic run of `latex` and `bibtex` creates a bbl file. This bbl file is pasted into the original tex file `main.tex`., which is then renamed `main_bibchecked.tex`.
4. Now you can start editing the new ('bibchecked') tex file. For this, *you must check each* `\bibitem`:
   - If there was a **MathSciNet match**, the original entry appears as a comment (%) below the match. It is important to compare the original entry and the match because sometimes MathSciNet delivers a wrong result. However, a quick comparison of e.g. the page range provides clarity. Or, if the original entry has an MR number, you can compare it with the MR number of the match.
   - If there was **no MathSciNet match**, the entry is now at the beginning of the bibliography. This means, you have to (a) sort this entry and (b) format it by hand. This is a disadvantage of the tool; but it happens to only a few entries.
5. In addition, each `\bibitem` is compared with zbMATH and (if there was a match) extended by the respective number. But again: You must compare the original entry and the zbMATH match (which also appears below the match as a comment) to ensure that both describe the same publication.
6. That's it!

2.2 Case 2: Your tex file uses a BibTeX file

1. Write: `\bibliographystyle{emss}` `\bibliography{name-of-your-bib-file}`
2. Run `bibtex` and copy the bbl content into the tex file.
3. Proceed as in Case 1.

2.3 Case 3: Your tex file uses amsref

1. If your tex file contains `\usepackage{amsref}`, the entries of the bibliography must be first converted to a BibTeX file. This can be done
   - by hand,
   - using the L3 attempt or
   - using `ltb2bib`.
2. Proceed as in Case 2.

2.4 Use a bat file on Windows

Instead of using the Command Terminal, you can create and use a bat file:

1. Create, using any text editor, a file `bibcheck.bat` containing the following four lines:

   ```
   @echo off
   chcp 65001
   lua "C:\...\bibcheck.lua" %~f1 emss
   pause
   ```

   Here `C:\...\bibcheck.lua` is the full path of `bibcheck.lua`. Keep the quotation marks!
2. Create a desktop shortcut of that batch file.
3. Now drag and drop your tex file onto the desktop shortcut. Easy!

3 Noteworthy

1. Be aware of **mismatches**. They mainly appear when
   - the original entry is a preprint (e.g. arXiv) and MathSciNet returns a journal article with the same title;
   - the original entry is the original version (e.g. in Russian) and MathSciNet returns the English translation, or the other way around;
   - the original entry and the MathSciNet match have a very similar title, maybe even the same author, but are different.
2. The bibliography in `main_bibchecked.tex` is based on MathSciNet. Here are some known problems with MathSciNet:
   - Book series are often not abbreviated; so you must abbreviate them by hand following https://www.siam.org/Portals/0/Journal%20PDFs/serials.pdf.
   - Write always 'Springer', avoid 'Springer-Verlag', 'Springer Verlag', etc.
   - Some Astérisque papers are of entry type `@incollection` containing a field `journal`:

     ```
     @incollection {Shelstad1989,
         AUTHOR = {Shelstad, D.},
          TITLE = {A formula for regular unipotent germs},
           NOTE = {Orbites unipotentes et repr{\'{e}}sentations, II},
        JOURNAL = {Ast{\'{e}}risque},
       FJOURNAL = {Ast{\'{e}}risque},
         NUMBER = {171-172},
           YEAR = {1989},
          PAGES = {275--277},
           ISSN = {0303-1179},
        MRCLASS = {22E35 (11F70 11R39 11S37)},
      MRNUMBER = {1021506},
    MRREVIEWER = {Joe Repka},
    }
     ```

     Officially, `journal` is not an allowed field for `@incollection`. Thus, bst files (such as `emss.bst`) will not print `journal`, they rather expect a field `booktitle`. In this case, the name 'Astérisque' has to be restored by hand.

3. The hit rate with zbMATH is not as high as with MathSciNet. This means: Not all publications listed in zbMATH are found. In this case, a manual search often helps: https://zbmath.org/citationmatching/. Here, the hit probability increases if you only enter parts of the `\bibitem`.

4. To improve Bibcheck's results, you should replace all instances of `\bysame` in your original tex file by the respective authors.

5. The temporary BibTeX file (created by Bibcheck) contains the MR and zbMATH numbers:

   ```
   zblnumber = {1460.22007}, mrnumber = {4028458}
   ```

   Your bst file must know how to deal with these entries. If, for instance, you use `emss.bst`, the final `\bibitem` (of `main_bibchecked.tex`) will contain

   ```
   \Zbl{1460.22007} \MR{4028458}
   ```

   The tex file (resp. cls/sty file), in turn, must have a definition for the commands `\Zbl` and `\MR`.

   Thus, if you don't need any zbMATH numbers, you may either

   - use a bst file that ignores the field `zblnumber`, or
   - define `\newcommand\Zbl[1]{}`, or
   - open `config.lua` and set `M.printZbl = false` (then the comparison with zbMATH is not made in the first place and Bibcheck runs much faster).

6. When running `bibcheck`, you may skip the last argument (BSTFILENAME). This will activate the default bibliography style as defined in `config.lua`.