Reproducibility of mathematical data: practical 2

(Alex Elzenaar, 2/8/22)

> **Important Warning**
>
> We are going to look at real MathRepo pages that were written by people that you know. We have tried to choose examples that are overall good examples of the kinds of things you should try to produce, but that might have one or two flaws. Please be nice and stay constructive in any criticism you come up with.

Have a look at the MathRepo page: `https://mathrepo.mis.mpg.de/FiberZonotopes/index.html`

Don't worry about the mathematics, we are just interested in the practical aspects of reproducibility. It is not important for you to get through everything here unless you find you have a lot of time, it is only important to us that you end up answering the following questions:

1. List three things that are good practice which this page does.

2. List three things you would change or improve.

3. Do you think that there were any particular challenges faced by the authors of this page when they made it?

1 Work out what results you want to reproduce, and find them.

Check that you can find the original paper, and that the original paper links to this page! Do you think that the MathRepo page contains enough context that you would be able to start understanding what the point of the work is, if you had enough time? Who is the audience of the page? (People who have already read and understand most of the paper? People working through the paper for the first time? People trying to work out if they want to read the paper?)

We will restrict ourselves to the `OSCAR` code and related data, but think about the advantages and disadvantages of listing a version in `OSCAR` and one in `Sage`.

2 Get the tools that the authors used.

Can you tell which `OSCAR` version the authors used? What about the computer operating system which they were running on? Are there any other version numbers etc. which you would need (any other software dependencies, for example)?

In any case, at this point try to spin up a copy of `Julia`. Here is how to do it from a terminal if you are on a UNIX-like computer (including MacOS X) connected to the MPI network:

```
ssh -Y [your mpi username]@hydra.mis.mpg.de
ssh -Y compsrv
julia
using Pkg
Pkg.add("Oscar")
```

Now type `using Oscar`, you should get a bunch of scrolling text and a banner.

3   Modify the tools so that they are in a form which we can actually use.

Enter two `Julia` functions which the page gives. Do they produce errors, or are the definitions correct legal `Julia/OSCAR`

4   Actually reproducing the results.

Try to reproduce the green picture at the top of the page. Do the authors give enough information to check that the output is correct—is the picture enough? If not, what other information would you have liked the authors to include?

How confident are you that the code actually does what it says it does, and correctly?