Reproducibility of mathematical data: practical 5

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> **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/OrdersPolytropes/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? In particular, is it clear to you what kinds of results you should expect if you were to try to run some of this code? 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 try to reproduce the first couple of examples in the subpage 'Orders and Polytropes: Matrix Algebras from Valuations'.

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.

4   Actually reproducing the results.

Essentially these final steps boil down to trying to reproduce the output given in the subpage, so we want to try to copy and paste each section separately. If you get any errors, try to work out whether it is a typo or error in the code, or perhaps a missing file that you need to put somewhere. If you want help moving a file onto the compute server, please ask for help.

Now, suppose you have managed to run the code without errors. Do the authors give enough information to check that the output is correct (for instance, example output)? Is the result you got correct in comparison with the authors' claims? Is it clear how to get the pictures on the front page?