WIGXJPF library and program

General Information

WIGXJPF evaluates Wigner 3j, 6j and 9j symbols accurately using prime factorisation and multi-word integer arithmetic.

Type
　Scientific software, program package
Language
　Program: C. Library interfaces: C, Fortran, Python
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Acknowledgment
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Reference
　The recommended way to refer to WIGXJPF, when used for computations that are published in a research article, is to cite the following paper:
　H. T. Johansson and C. Forssén, *Fast and Accurate Evaluation of Wigner 3j, 6j, and 9j Symbols Using Prime Factorization and Multiword Integer Arithmetic*, SIAM J. Sci. Comput., 38(1) (2016), A376-A384. eprint http://dx.doi.org/10.1137/15M1021908
　Pre-print (2015) at arXiv:1504.08329

Download

Location
　http://fy.chalmers.se/subatom/wigxjpf/wigxjpf-1.11.tar.gz
Contact
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Version

1.11 ([CHANGELOG](#))

Support

No formal support

Alternatives

Library for fast lookup: [FASTWIGXJ](#).
(If your program uses *very* many symbols; trades memory for speed - factor 10+.)

Library for sequence evaluation: [WIGSGLL](#).
(If your program uses *sequences* of symbols.)

Documentation

See [README](#) (included with download).

A short [slide-show presentation](#).

Some [usage statistics](#).

Examples

Symbol evaluation

Symbols can be evaluated directly from the command-line after download and unpacking (half integer arguments are given on decimal form, e.g. ½ as `0.5`):

```
make
bin/wigxjpf --6j=2,2,1,2,1,1
```

C interface usage

Compile with `-Ipath-to-wigxjpf/inc/` and link with `-Lpath-to-wigxjpf/lib/ -lwigxjpf` (note that the evaluation functions take 2* the angular momenta arguments as integers).

```
#include "wigxjpf.h"

int main()
{
  double val6j;

  wig_table_init(2*100, 9);
  wig_temp_init(2*100);

  val6j = wig6jj(2*  2 , 2*  2 , 2*  1 ,
                 2*  2 , 2*  1 , 2*  1 );

  wig_temp_free();
  wig_table_free();

  return 0;
}
```

Python interface usage

Either compile locally:

```
make pywigxjpf_ffi
```

or install [pywigxjpf](#) directly from [PyPI](#):

```
pip install pywigxjpf
```

Example usage:

```
import pywigxjpf as wig

wig.wig_table_init(10, 9)
wig.wig_temp_init(10)

wig.wig6jj(2*  2 , 2*  2 , 2*  1 ,
           2*  2,  2*  1 , 2*  1 )
```

MATLAB usage

Latest version link
[wigxjpf-latest.tar.gz](#)

To avoid version numbers in directory name, unpack with:

```
tar --transform 's/wigxjpf-[0-9.]*/wigxjpf/' -zxf wigxjpf-latest.tar.gz
```

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