jInvert.pdf

The "j" signals that complex numbers are involved.

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The link to this file:
https://ftp.setterholm.com/WorldPeace/Golden/jInvert/jInvert.pdf

The PhilosophyWorks®
Lakeville, Minnesota, U.S.A.
https://setterholm.com

This computer program runs on Windows 10 and Windows 11 64-bit operating systems and inverts complex matrices, which will aid in finding the complex roots of complex polynomials. Zip file "jInvert.zip" has all the content:

Here the example input complex matrix jC(3,3) is inverted in three steps to jCinv(3,3) As follows: Each complex coefficient has a real part and an imaginary part.

```
@ Rank =  0                    abs(CdetN) =       0.0000000000E+00                    :JC(3,3)
                          +1                                +2                               +3
   1  (    +0.100000,    +0.000000j) (    +0.100000,    +1.000000j) (    +1.000000,    +0.000000j)
   2  (    +2.000000,    +0.000000j) (    +0.100000,    +0.000000j) (    +0.100000,    -2.000000j)
   3  (    +0.100000,    +0.000000j) (    -4.000000,    +0.000000j) (    +0.100000,    +0.000000j)
     ------------------------------------------------------------------------------------------
                              ValMin  =   0.400000E-23 scaled by pivot:

    iu =  3  ju =   2               Pivot = (    -4.000000,    +0.000000j)
@ Rank =  1                    abs(CdetN) =       0.4000000000E+01
                          +1                                +3                               -2
   1  (    +0.102500,    +0.025000j) (    +1.002500,    +0.025000j) (    +0.025000,    +0.250000j)
  -3  (    -0.025000,    +0.000000j) (    -0.025000,    +0.000000j) (    -0.250000,    +0.000000j)
   2  (    +2.002500,    +0.000000j) (    +0.102500,    -2.000000j) (    +0.025000,    +0.000000j)
     ------------------------------------------------------------------------------------------
    iu =  3  ju =   2               Pivot = (    +0.102500,    -2.000000j)
@ Rank =  2                    abs(CdetN) =       0.8010499360E+01
                          +1                                -3                               -2
   1  (    +0.076158,    -0.977403j) (    -0.013155,    -0.500576j) (    +0.024671,    +0.237486j)
  -3  (    -0.023721,    +0.024966j) (    +0.000639,    +0.012467j) (    -0.249984,    +0.000312j)
  -2  (    +0.051180,    +0.998627j) (    +0.025558,    +0.498690j) (    +0.000639,    +0.012467j)
     ------------------------------------------------------------------------------------------
    iu =  1  ju =   1               Pivot = (    +0.076158,    -0.977403j)
@ Rank =  3                    abs(CdetN) =       0.7853218703E+01                  :jCinv(3,3)
                         -1                                -3                               -2
  -1  (    +0.079239,    +1.016945j) (    +0.508016,    -0.053043j) (    -0.239555,    +0.043907j)
  -3  (    +0.027268,    +0.022144j) (    +0.011365,    -0.001474j) (    -0.254570,    +0.007334j)
  -2  (    +1.011493,    -0.131177j) (    -0.053412,    -0.005913j) (    +0.056746,    +0.249446j)
     ------------------------------------------------------------------------------------------
            sign untracked:         CdetN = (    +7.788000,    +1.010000j)
```

The compressed download is:

https://ftp.setterholm.com/WorldPeace/Golden/jInvert/jInvert.zip

Download this file to your computer and "extract" the contents. Typically the extracted files are in subdirectory **"/jInvert**". In that subdirectory **change** "jInvert.exf" to "jInvert.exe" which Windows then refers to as an 'application". The program runs in a DOS window that you can X out of at the upper right corner.

```
04/20/2026  08:36 PM         2,234,021 jInvert.zip
-----------------------------------------------
04/20/2026  08:35 PM           354,285 jInvert.pdf   <-This .pdf

!A Directory
04/20/2026  07:54 PM             1,795 _Dir.tx

!A sample input file:
04/19/2026  04:12 PM             2,019 jInvert-Input.txt
!A sample output file:
04/19/2026  06:17 PM             6,060 jInvert-Results.txt

!Fortran source listings .pdf's with color-coded syntax & line #'s:
04/19/2026  06:06 PM           504,375 jInvert_Demo-F95.pdf Demonstrator
04/19/2026  06:19 PM         1,257,896 jInvert-f95.pdf      Inverter
      Module     jInvert_FoR             <- The "Frame-of-Reference"         @ 31
      End Module jInvert_FoR                                                 @ 68
      Subroutine jInvert(Nin,C,iRW,iP)   <- the overwriting complex inverter @ 68
      Subroutine jInvert_Report(N,C,iP)  <- overwriter progress reports      @237
      Subroutine jInvert_Check(N,Cout,iP)<- quality confirmation (full rank) @270
                                                 @: approximate Line#'s ^^^^
!Absoft Pro Fortran 64-bit build environment:
04/19/2026  06:19 PM            43,254 jInvert.atools

!Fortran 95 source code
04/19/2026  06:04 PM             5,283 jInvert_Demo.f95
04/19/2026  06:17 PM            14,460 jInvert.f95

The Executable file: Should run in 64-bit Windows 10 & Windows 11.
04/19/2026  06:17 PM           317,952 jInvert-64.exe
             In "jInvert.zip"  the extension is ".exf"
             When unzipped, ***CHANGE TO***:    ".exe"

Name your input file and output file here:                  see page 3
Conform the syntax of your input file to "jInvert-Input.txt"
04/19/2026  11:21 AM             1,534 jInvert-Filenames.ini


jInvert-64.exe also genereates these two binary files:
04/19/2026  06:17 PM               308 jCin.bim
04/19/2026  06:17 PM               320 jCinv.bim
             Windows security rejects .bin files,
              hence the use of a .bim extension
           ~ 14 File(s)    ~ 2,175,466 bytes
```

Off-topic: Intersecting linear programming and complex variables might be fruitful. Linear programming reliably realized manufacturing process efficiencies many decades ago. Also, the assumption that "war is inevitable" may be flawed, or nonsense.

“jInvert-Filenames.ini” and its notes:

```
"jInvert-Input.txt",            <- Line 1
"jInvert-Results.txt",          <- Line 2

Everyting after line two is ignored.
||||||||||||||||||||||||||||||||||||||

Your "jInvert.exe" filenames initializer:
Line 1: names your input  matrix file.
Line 2: names your output matrix file.
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When "jInvert-Filenames.ini" is absent or unreadable, default names are:
"jInvert-Input.txt",          -and-
"jInvert-Results.txt",
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Additional jInvert() outputs:
complex(16) binary matrix coefficients (256-bits total-per-coefficient):
jCin.bim                      -and-
jCinv.bim
The extension is ".bim" because Windows security blocks ".bin" files.
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jInvert() is a key enabler in finding the complex roots
  of complex polynomials that fit complicated data.

jInvert()  also  "inverts"  linearly-dependent  complex  matrices.  I
haven't yet confirmed either the accuracy or the utility of doing so.
For real matrices the corresponding feature is remarkably useful.

2026.04.20 JMS
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My first-principles introduction to real matrix inversion is:
    https://ftp.setterholm.com/PseudoInverse/Hat.pdf - pages 1-4.
                  "Hyperspace Algebra Tools"

"Hat.pdf"  is  a  very  direct  path  describing  "what  to  teach"  in  an
introduction. "How to teach" the material needs improvement.
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```

The context for this FTP upload can be found in my two previous posts:
https://ftp.setterholm.com/WorldPeace/Golden/_Golden-Readme.pdf
and in the same subdirectory: **/QuantitativeGovernance.pdf**.

The hallmark/my definition of Wisdom is realizing harmony with minimum effort. Qualitative Governance is a waste of almost-everyone’s time.

I learned that “cells’ votes” don’t solve Rubik’s Cubes (achieve harmony) in the fewest number of moves. Search in vain – for unaided wisdom - sourced between any pair of human ears. Causing chaos is intuitive: the USA and Israel are bombing Iran and Lebanon!

Wisdom (shortest-path harmony) is non-intuitive: The concise definition has made it quantifiable; WisdomCAD was last-year’s free, new name for the idea. Search it; as of a week ago: Google was still redirecting people to “Wisdom Card”.