

# Ivory Tower

## Software

Documentation for freeware **Big Number Cruncher™**, version 1.05  
July 8, 1993

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### ***Big Number Cruncher***

Now personal computer owners can handle very large numbers without round-off errors. Until now, if you wanted to add, subtract, or divide two 45-digit numbers, you needed a mainframe computer. With **Ivory Tower Software's *Big Number Cruncher*** and Microsoft's Windows operating environment, your PC can have the power of a mainframe. You can even multiply any two integers as long as the product is 45 digits or less. This is important when you need exact answers. *Big Number Cruncher* also factors numbers up to 45 digits, listing all the prime factors.

For serious work with this application, open a Notepad file and keep your operands and results as ASCII strings, using the *Copy* and *Paste* commands from *Big Number Cruncher's* button (and menu) commands.

*Big Number Cruncher* is the only program of its kind that will run on a personal computer. Version 1.03 now writes the list of prime numbers it generates during factoring operations to disk so the next time you factor a large number, the performance will be much faster.

### **Installation**

Copy BIGNUM.EXE and PRIMES.DAT to a directory on your hard drive. The dynamic link library VBRUN300.DLL (which can be obtained from CIS WinShare forum as VBRUN3.ZIP) should be in any directory in your DOS PATH, but putting your DLL files in either the Windows or Windows/System directories is customary.

You can install *Big Number Cruncher* as an icon in your program manager in the usual manner.

### **How *Big Number Cruncher* Works**

Most personal computers cannot handle numbers bigger than about 14 decimal places

without rounding off. Floating point arithmetic in most applications rounds off to that precision. *Big Number Cruncher*, however, handles integers with exact precision up to 45 decimal places, quickly adding, subtracting, multiplying, and dividing them. *Big Number Cruncher* will even factor such numbers, taking a bit longer time for the bigger ones, however. For factoring the larger numbers, a status window is displayed every minute, telling you about the progress of the factoring operation and the estimated time remaining. Calculation continues while *Big Number Cruncher* is minimized, of course.

Operands are entered in the top two number windows by the user. Operations are performed on these operands and the result is displayed in the lower number window. For the factoring operation, only the first operand is used. The list of factors generated is displayed in a pop-up window when the operation is completed.

If there are features you would like to see in future versions of this software, or if you find a bug or have any other comment, please contact me at the following address:

**Ivory Tower Software**  
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You may also send me a message via CompuServe (76427,2611). If you are reporting a bug, please mention the version number.

*Big Number Cruncher* is freeware, provided as a public service by **Ivory Tower Software**. You may be interested in other **Ivory Tower Software** products. You can see all of our products in the CIS WinShare and WinFun forums by searching on keyword "ITS."

## History

<b>Vers.</b>	<b>Date</b>	<b>Description</b>
1.00	13-Apr-93	First distribution as freeware. The factoring operation time estimate gets a performance factor from your hardware for its calculation.
1.02	31-May-93	Has significantly improved factoring operations. The estimated time is more accurate and the algorithm is faster. The program actually stores up to 32,766 prime numbers so they don't have to keep on being recalculated. They are not saved to disk, however, so there is some learning time each time the program is restarted.
1.03	23-Jun-93	This version saves the prime number list to disk (primes.dat) each time it is enlarged during factoring operations.

The program reads this file on startup, so it effectively gets smarter every time you factor a bigger number. The "remainder" operation has been added, and the factoring algorithm is much faster than in the previous version. There is also a "multitasking" level option which the user can set depending on his priorities. Still freeware.

1.05

08-Jul-93 Fixes the rare "subscript out of range" bug in the factoring operation. Adds the computation of the factorial of a small integer. Compiled with Visual Basic 3.0.