

Running Schoonschip in 2026

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Schoonschip

Schoonschip was the first computer algebra system, written by Veltman.

Written in assembler for:

- 1963: IBM 7094
- 1966: CDC 6600
- 1983: M68k (Amiga, Atari, NeXTStation) CPU O(10)MHz, RAM O(1-10)MB

See also:

Macsyma, **REDUCE** ('68), **SMP** ('81), **Maple** ('82), **Fermat** ('85), **Mathematica** ('88), **FORM** ('89)

Manual: 1991: [<https://inspirehep.net/literature/1685521>]

Veltman software collection: [<https://vsys.physics.lsa.umich.edu/index.html>]

- David Williams, James Liu
- docs, binaries, source (2009), vsys (2014) [LGPL, BSD3]

Examples

```
C Example 1
Z XX = (a + b)^2
*begin
B a
Z XX = (a + b)^2
*end
```

C Example 1

```
      Z XX = (a + b)^2
      *begin

XX =  + 2*a*b + a^2 + b^2 + 0.

Begin. Time 0 sec.
      B a
      Z XX= (a + b)^2
      *end

XX =  + b^2

      + a
      * ( 2*b )

      + a^2 + 0.

End run. Time 0 sec.
```

Examples

```
I al,be,mu,nu
A N,N_
V p,k
F F,F20,F22

Z xx = G(1,1,al,be,p,al,be,p)

Id,All,p,N,F
P output
*yep
Id,F(i1~,i2~) = D(i1,i2)*F20(k) + k(i1)*k(i2)*F22(k)
*end
```

Examples

...

```
Z xx = G(1,1,al,be,p,al,be,p)
```

```
L 1      Id,All,p,N,F
```

```
> P output
```

```
    *yep
```

```
xx = + G(1,1,al,be,Naa,al,be,Nab)*F(Naa,Nab) + 0.
```

```
L 1      Id,F(i1~,i2~) = D(i1,i2)*F20(k) + k(i1)*k(i2)*F22(k)
```

```
    *end
```

```
xx = + G(1,1,al,be,Naa,al,be,Naa)*F20(k)
```

```
    + G(1,1,al,be,k,al,be,k)*F22(k) + 0.
```

```
End run. Time 1 sec.
```

“Computations involving over 50k terms” ...

Veltman: *the triangle diagram if computed fully gives rise to a monstrous expression involving the order of 50000 terms...* [<https://www.nobelprize.org/uploads/2018/06/veltman-lecture.pdf>]

WW.e part 12: (Schip_n +12 WW.e)

Terms in output	3163		
Running time	36 sec	Used	Maximum
Generated terms	71544	Input space	5482 100000
Equal terms	56807	Output space	110918 250000
Cancellations	11574	Nr of expr.	30 255
Multiplications	370345	String space	0 4096
Records written	3	Merging	0 0

Running Schoonschip

The binaries can be run in emulated systems.

Fairly straightforward with OPENSTEP 4.2

- use, for e.g., Previous emulator [<https://previous.nextcommunity.net/>]
- need OPENSTEP harddrive image for use with Previous
- use NFS to transfer **Schoonschip** files
 - configure on host in `~/.config/previous/previous.cfg`
 - view in OPENSTEP in `/Net/nfs/`

(OPENSTEP for Mach was ultimately bought by Apple in '97, basis for modern macOS, iOS)