

SCILAB:

Comparison with other mathematical interpreters

Main topics

- [Scilab et al.](#)
- [Comments on spreadsheet tables](#)
- [A spreadsheet table with missing data](#)
- [Numerical Mathematics Consortium](#)

- [pdf version \(2010-05-25 in English\)](#)
- [Return to 'ModLibre'](#)

General programming

Matlab		Octave		Scilab	
%	=	%	!	//	Comments
...	=	...	=	...	Continue
...	=	...	←	..	<i>Non portable Variants</i>
...	←	,	→	...	
...	←	\	⇒	...	
exist()	=	exist()	→	exists()	Variable existence
exist()	=	exists()	=	<i>exist()</i>	<i>Function programmable with 'exists()'</i>
version	=	version	#	getversion()	Interpreter version ...

Numerical constants

Matlab

Octave

Scilab

eps

=

eps

!

%eps

epsilon

i

=

i

!

%i

sqrt(-1)

inf

=

inf

!

%inf

infinite

nan

=

nan

!

%nan

not a number

pi

=

pi

!

%pi

pi

Matrix definition

Matlab		Octave		Scilab	
M=[1 2; 3 4];	=	M=[1 2; 3 4];	=	M=[1 2; 3 4];	Definition
I=eye(n, m);	=	I=eye(n, m);	=	I=eye(n, m);	Identity matrix
U=ones(n, m);	=	U=ones(n, m);	=	U=ones(n, m);	Matrix of 1
R=rand(n, m);	=	R=rand(n, m);	=	R=rand(n, m);	Random matrix
Z=zeros(n, m);	=	Z=zeros(n, m);	=	Z=zeros(n, m);	Zero matrix
Z=zeros(size(A));	=	Z=zeros(size(A));	!	Z=zeros(A);	Zero matrix !

Usual matrix operators

Matlab	=	Octave	=	Scilab	
R = A + B;		R = A + B;		R = A + B;	Addition
S = A - B;		S = A - B;		S = A - B;	Subtraction
T = A * C;		T = A * C;		T = A * C;	Multiplication
U = A / D;		U = A / D;		U = A / D;	Division

Element by element matrix operators

Matlab	=	Octave	=	Scilab	
R = A .+ B;		R = A .+ B;		R = A .+ B;	(Addition)
S = A .- B;		S = A .- B;		S = A .- B;	(Subtraction)
T = A .* B;		T = A .* C;		T = A .* C;	Multiplication
U = A ./ B;		U = A ./ B;		U = A ./ B;	Division
U = A .^ B;		U = A .^ B;		U = A .^ B;	Exponentiation

Character strings

Matlab

Octave

Scilab

Char

=

Char

!

String

Elementary structure

'

=

'

=

'

Delimiter

'

↔

"

=

"

Delimiter

[A B]

=

[A B]

!

A + B

Concatenation

strcat(A, B)

=

strcat(A, B)

=

strcat(A, B)

Concatenation

str2mat(A, B)

⇒

[A; B]

=

[A; B]

String alignment

num2str

=

num2str

!

string

Numerical conversion -> string

String Matrices

Matlab - Octave

Scilab

```
M=["Matlab=" "7.8";...
  "Octave=" "3.0";...
  "Scilab=" "5.1"];
```

```
M=["Matlab=" "7.8";...
  "Octave=" "3.0";...
  "Scilab=" "5.1"];
```

Definition

-->M

-->M

Printing

M =

M =

Result

```
!Matlab=7.8 !
!           !
!Octave=3.0 !
!           !
!Scilab=5.1 !
```

```
!Matlab= 7.8 !
!           !
!Octave= 3.0 !
!           !
!Scilab= 5.1 !
```

3. 10.

3. 2.

size(M)

Data annotation

```

EN|Shannon diversity index
FR|Indice de diversité de Shannon
//
// Au: MAGURRAN Anne E. (1988)
// Ta: Ecological Diversity and its Measurement.
// Pu: Princeton University Press, Princeton, New Jersey, pp. 145-146.
//
//
//
//
EN|Species:           Espèces:           Oak:           Spruce
FR|Species:           Espèces:           Chêne:         Epicéa
Chaffinch:           Pinson:           35            30
Robin:               Rouge-gorge:      26            30
Goldcrest:           Roitelet huppé:  21            65
Wren:                Roitelet:         16            20
Tree-creeper:        Grimpereau:       5             4
Siskin:              Tarin:            3             2
Blackbird:           Merle:            3             14
Woodpigeon:          Pigeon ramier:   3             9
Woodcock:            Bécasse:         2             0
Redstart:            Rouge-queue:     1             0
Sparrowhawk:        Épervier:        1             0
Crow:                Corbeau:         0             1

```


A typical spreadsheet table

Many spreadsheet tables can be represented by 5 matrices:

- a string matrix **Tit** for titles, sub-titles and comments,
- a classical matrix **Val** for the numerical values,
- a string matrix **Nam** for the column names of the **Val** matrix,
- a string matrix **Lab** for the line labels of the **Val** matrix,
- a string matrix **NamLab** for the names of the **Lab** matrix.

```
Tit(1)      -> Title
Tit(2)      -> Sub-title
Tit(3)      -> Comments
NamLab(1,1) NamLab(1,2) Nam(1,1)  Nam(1,2)  Nam(1,3)  Nam(1,4)
NamLab(2,1) NamLab(2,2) Nam(2,1)  Nam(2,2)  Nam(2,3)  Nam(2,4)
Lab(1,1)    Lab(1,2)   Val(1,1)  Val(1,2)  Val(1,3)  Val(1,4)
Lab(2,1)    Lab(2,2)   Val(2,1)  Val(2,2)  Val(2,3)  Val(2,4)
Lab(3,1)    Lab(3,2)   Val(3,1)  Val(3,2)  Val(3,3)  Val(3,4)
```

Intertwined spreadsheet matrices

Many spreadsheet tables can be represented by 5 intertwined matrices:

- a string matrix **Tit** for titles, sub-titles and comments,
- a classical matrix **Val** for the numerical values,
- a string matrix **Nam** for the column names of the **Val** matrix,
- a string matrix **Lab** for the line labels of the **Val** matrix,
- a string matrix **NamLab** for the names of the **Lab** matrix.

```
Tit(1)      -> Title
Tit(2)      -> Sub-title
Tit(3)      -> Comments
NamLab(1,1) Nam(1,1)  Nam(1,2)  NamLab(1,2)  Nam(1,3)  Nam(1,4)
Lab(1,1)    Val(1,1)  Val(1,2)  Lab(1,2)    Val(1,3)  Val(1,4)
Lab(2,1)    Val(2,1)  Val(2,2)  Lab(2,2)    Val(2,3)  Val(2,4)
NamLab(2,1) Nam(2,1)  Nam(2,2)  NamLab(2,2)  Nam(2,3)  Nam(2,4)
Lab(3,1)    Val(3,1)  Val(3,2)  Lab(3,2)    Val(3,3)  Val(3,4)
Lab(4,1)    Val(4,1)  Val(4,2)  Lab(4,2)    Val(4,3)  Val(4,4)
```

A spreadsheet table with missing data

EN|EVOLUTION
FR|EVOLUTION

Site:	Date:	Hour:	Test-A:	Bar-A:	Test-B:	Bar-B:	Test-C:	Bar-C:
TOI	2000.0215	08	-	-	46	4	-	-
PAI	2000.0309	08	-	-	41	3	-	-
LOI	2000.0427	08	65	8	39.6	3	180	10
LOI	2000.0920	08	68	5	44.6	4	150	10
PAI	2001.0115	08	83	8	75.8	5	110	8
PAI	2001.0427	08	118	10	93.5	8	130	9
TOI	2001.1002	08	125	7	-	-	-	-
LOI	2002.0120	08	106	9	110	6	140	10
PAI	2002.0503	08	79	8	115	7	160	7

Numerical Mathematics Consortium (NMC)

⇒ **standardization of core numerical mathematics** ⇐

Founding members (2005)

- INRIA (Scilab)
- Maplesoft (Maple)
- PTC (Mathcad)
- National Instruments

Preliminary Technical Specification

List of more than 250 mathematical functions with an emphasis on matrix computations.

Meanwhile

use semi-automatic translators ...

SCILAB:

Comparison with other mathematical interpreters

Main topics

- [Scilab et al.](#)
- [Comments on spreadsheet tables](#)
- [A spreadsheet table with missing data](#)
- [Numerical Mathematics Consortium](#)

- [pdf version \(2010-05-25 in English\)](#)
- [Return to 'ModLibre'](#)