EXAMPLE FILE FOR M2INTEX

PAUL ZINN-JUSTIN

1. Introduction

some basic examples:

```
i1 : R=QQ[x,y]; factor(x^3-y^3)
```

o2 = $(x-y)\,(x^2+x\,y+y^2)$

o2 : Expression of class Product

```
i3 : res coker vars R
```

o3 = $R^1 \xleftarrow{\begin{pmatrix} x & y \end{pmatrix}} R^2 \xleftarrow{\begin{pmatrix} -y \\ x \end{pmatrix}} R^1 \xleftarrow{0} 0$

$\qquad\quad 0 \qquad\qquad 1 \qquad\qquad 2 \qquad 3$

o3 : ChainComplex

```
i4 : OO_(Proj(R/(x^3-y^3)))^{1,2}
```

o4 = $\mathcal{O}^1_{\mathtt{Proj}\left(\frac{R}{x^3-y^3}\right)}(1) \oplus \mathcal{O}^1_{\mathtt{Proj}\left(\frac{R}{x^3-y^3}\right)}(2)$

o4 : coherent sheaf on $\mathtt{Proj}\left(\frac{R}{x^3-y^3}\right)$, free

more:

```
i5 : 318/46
```

o5 = $\frac{159}{23}$

o5 : $\mathbb{Q}$

```
i6 : exp 3.73767
```

o6 = 42

o6 : $\mathbb{R}$ (of precision 53)

strings:

```
i7 : "hehe"
```

o7 = hehe

and nets: (`tex Net` fixed on vanilla)

```
i8 : "haha"||"hoho"
```

o8 = haha
hoho

2. Help

```
i9 : help det
```

o9 =

determinant – determinant of a matrix

Synopsis

- Usage:
  `det M`
- Inputs:
  - `M`, a square `matrix`
- `Optional inputs`:
  - `Strategy => ...`, default value null, choose between Bareiss and Cofactor algorithms
- Outputs:
  - a `ring element`, which is the determinant of `M`

Description

See also

- `exteriorPower` – exterior power
- `minors` – ideal generated by minors
- `permanents` – ideal generated by square permanents of a matrix
- `pfaffians` – ideal generated by Pfaffians

Ways to use `determinant` :

- `"determinant(Matrix)"`
- `"determinant(MutableMatrix)"`

For the programmer

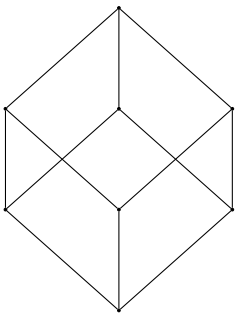
The object `determinant` is a `method function with options`.

```
o9 : DIV
```

3. PACKAGES

packages that have a `tex` output will work:

```
i10 : needsPackage "Posets";
i11 : booleanLattice 3
```



```
o11 =
o11 : Poset
```

4. MULTI-LINE EXAMPLE

```
i12 : f = i -> (
      i+1
      )
o12 = f
o12 : FunctionClosure
```

```
i13 : I=ideal 0; f = i -> (
o13 : Ideal of ℤ
      i+1)
o14 = f
o14 : FunctionClosure

i15 : a=1;b=2;
i17 : c=3;
```