

多項式の割り算とその応用 2 — Monomial ideal, term order

目標: モノミアルイデアルの極小生成元. 単項式順序. (std monomial の個数. 計算機の実習.)

入力: emacs で編集. unix shell からソフトを起動.

Maple.

```
maple
read 't.txt';
```

```
with(Groebner);
# Basis is used in new versions.
G:=gbasis([x^2,x^2*y,y^4,x*y],[x,y],tdeg);
M:=[op(expand((1+x+y)^3))];
# TestOrder and grlex are used in new versions.
# tdeg is graded lex order
sort(M,(a,b)->testorder(a,b,tdeg(x,y,z)));
```

Asir. (lexicographic order は 2)

```
fep asir
load("t.txt");
```

```
G=nd_gr([x^2,x^2*y,y^4,x*y],[x,y],0,0);
dp_ord(0);
F=(1+x+y)^3;
dp_ptod(F,[x,y]);
end$
/* $
[y^4,x^2,y*x]
*/
```

CoCoA, Macaulay2, Singular は可換環論システムの御三家. 得意分野が違うので必要に応じていろんなシステムを使う.

```
cocoa
Source "t.txt"

M2
load "t.txt"

Singular
< "t.txt";
```

Macaulay 2. (lexicographic order は Lex)

```
QQ[x,y,MonomialOrder=>GRevLex]
I = ideal(x^2,x^2*y,y^4,x*y)
gens gb I
(1+x+y)^3
```

Singular. (lexicographic order は lp)

```
ring R=0,(x,y),dp;
ideal I=x^2,x^2*y,y^4,x*y;
ideal J=std(I);
J;
(1+x+y)^3;
```