

Buchberger's Algorithm

Dylan Zwick

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Today we're going to implement Buchberger's algorithm using Maple, the procedures we've programmed so far, and some procedures I've written for today. Note that these procedures use the procedures we've written the last few days, so you'll need to have those loaded and ready to go as well.

I've written the following two procedures that, when entered one after the other, will provide you with the functionality for calculating S polynomials.

```
MONLCM := proc(f,g,variables) local i, lcom;
i := 1;
lcom := 1;
while i < nops(variables) + 1
do
lcom := lcom *
variables[i]^(max(degree(f,variables[i]),degree(g,variables[i])));
i := i+1;
od;
expand(simplify(lcom));
end;
```

and

```
SPOLY := proc(f,g,variables,weights)
```

```
expand(simplify(MONLCM(LT(f,variables,weights),
LT(g,variables,weights),variables)*
(1/LT(f,variables,weights)*f-1/LT(g,variables,weights)*g)));
end;
```