ggmc.ms
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This is an example of using the Maple simplex routines to solve linear programs.
Here is the GGMC problem.

```
> with(simplex):
Warning: new definition for   maximize
Warning: new definition for   minimize
```

```
> objective:=5*x1+4*x2;
```

$$objective := 5\, x1 + 4\, x2$$

```
> constraints:={x1+2*x2<=120,x1+x2<=70,2*x1+x2<=100};
```

$$constraints := \{2\, x1 + x2 \le 100,\ x1 + 2\, x2 \le 120,\ x1 + x2 \le 70\}$$

```
> ggmc:=(objective, constraints,NONNEGATIVE);
```

$$ggmc := 5\, x1 + 4\, x2,\ \{2\, x1 + x2 \le 100,\ x1 + 2\, x2 \le 120,\ x1 + x2 \le 70\},\ NONNEGATIVE$$

```
> maximize(ggmc);
```

$$\{x1 = 30,\ x2 = 40\}$$

Maple can also compute solve the dual problem.

```
> kc:=dual(ggmc);
```

$$kc := 100\, NONNEGATIVE1 + 120\, NONNEGATIVE2 + 70\, NONNEGATIVE3,\ \{5 \le 2\, NONNEGATIVE1 + NONNEGATIVE2 + NONNEGATIVE3,\ 4 \le NONNEGATIVE1 + 2\, NONNEGATIVE2 + NONNEGATIVE3\}$$

```
> minimize(kc,NONNEGATIVE);
```

$$\{\, NONNEGATIVE2 = 0,\ NONNEGATIVE1 = 1,\ NONNEGATIVE3 = 3 \,\}$$