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Maple codes for transportation problems

Solving the warehouse example (the first example in Ch 8):

```
with(linalg):
c:=vector([464, 513, 654, 867, 352, 416, 690, 791, 995, 682, 388, 658])"
x:=vector(12):
z:=dotprod(x,c);
CS:={x[1]+x[2]+x[3]+x[4]=75,  x[5]+x[6]+x[7]+x[8]=125,  x[9]+x[10]+x[11]+x[12]=100,
x[1]+x[5]+x[9]=80, x[2]+x[6]+x[10]=65, x[3]+x[7]+x[11]=70, x[4]+x[8]+x[12]=85}:
with(simplex):
sol:=minimize(z, CS, NONNEGATIVE);
assign(sol); z;
```

The following is what you should see when you type the above commands:

```
> with(linalg):
> c := vector([464, 513, 654, 867, 352, 416, 690, 791, 995,
    682, 388, 658]):
> x := vector(12):
> z := dotprod(x, c);
```

$$z := 464\ x_1 + 513\ x_2 + 654\ x_3 + 867\ x_4 + 352\ x_5 + 416\ x_6 + 690\ x_7 + 791\ x_8 + 995\ x_9 + 682\ x_{10} + 388\ x_{11} + 658\ x_{12}$$

```
> CS := {x[1]+x[2]+x[3]+x[4] = 75, x[5]+x[6]+x[7]+x[8]
    = 125, x[9]+x[10]+x[11]+x[12] = 100, x[1]+x[5]+x[9]
    = 80, x[2]+x[6]+x[10] = 65, x[3]+x[7]+x[11] = 70,
    x[4]+x[8]+x[12] = 85};
```

$$CS := \{x_1 + x_2 + x_3 + x_4 = 75,\ x_5 + x_6 + x_7 + x_8 = 125,\ x_9 + x_{10} + x_{11} + x_{12} = 100,\ x_1 + x_5 + x_9 = 80,\ x_2 + x_6 + x_{10} = 65,\ x_3 + x_7 + x_{11} = 70,\ x_4 + x_8 + x_{12} = 85\}$$

```
> with(simplex):
> sol := minimize(z, CS, NONNEGATIVE);
```

$$sol := \{x_4 = 55,\ x_5 = 80,\ x_3 = 0,\ x_7 = 0,\ x_9 = 0,\ x_{10} = 0,\ x_{12} = 30,\ x_{11} = 70,\ x_1 = 0,\ x_8 = 0,\ x_6 = 45,\ x_2 = 20\}$$

```
> assign(sol); z;
```

$$151725$$

```
>
```

Note: If the problem involves a big M, just replace it with a large number such as 1,000,000.