MATH3202/7232 Operations Research & Mathematical Planning 2017

Week 4 – Integer Programming

Telfa

Telfa Pty Ltd makes tables and chairs. Each of these items needs labour and wood. The unit profit and resources needed for each item are:

	Table	**Chairs**	**Available**
Profit ($)	8	5	
Labour (hrs)	1	1	6
Wood	9	5	45

Telfa need to decide how many tables and how many chairs to make.

Cloth Co

Cloth Co manufactures shirts, shorts, and pants. Each of these lines needs a special machine, which has to be rented. Of course the machine need not be rented if none of the line is produced. In addition each line needs labour and cloth as shown below.

Item	**Labour (hrs)**	**Cloth (m^2)**	**Price**	**Cost**	**Machine cost Rent ($/week)**
Shirts	3	4	$12	$6	$200
Shorts	2	3	$8	$4	$150
Pants	6	4	$15	$8	$100
Available	150	160			

What is the optimal production per week?

Set Covering

Kilroy council needs to build fire stations to service its six towns. It wants to build the minimum number of fire stations, yet ensure that each town is within 15 minutes of a fire station. For each city, they know all the cities that are within 15 minutes:

Town	Within 15 minutes
1	1,2
2	1,2,6
3	3,4
4	3,4,5
5	4,5,6
6	2,5,6

Which fire stations should be built?