

1. Linear programming example

A company makes **three products** and has available **4 workstations**. The production time (in minutes) per unit produced varies from workstation to workstation (due to different manning levels) as shown below:

		Workstation			
		1	2	3	4
Product	1	5	7	4	10
	2	6	12	8	15
	3	13	14	9	17

Similarly the profit (£) contribution (contribution to fixed costs) per unit varies from workstation to workstation as below

		Workstation			
		1	2	3	4
Product	1	10	8	6	9
	2	18	20	15	17
	3	15	16	13	17

If, one week, there are 35 working hours available at each workstation how much of each product should be produced given that we need at least 100 units of product 1, 150 units of product 2 and 100 units of product 3. Formulate this problem as an LP.

2. Mixed Integer Programming Example

A gangster may steal 8 different items:

Guitar: weight 8, value 10
TV: weight 20, value 30
Radio: weight 5, value 8
Computer: weight 16, value 50
Book: weight 3, value 3
Backpack: weight 4, value 2
Chair: weight 14, value 20
Calculator: weight 2, value 7

The gangster can carry a maximum weight of 50. He wants to steal as much value as possible. Which set of items should he steal?

1. Define the model on paper.
2. Implement the model in MathProg and let GLPK find the best solution for the gangster.

In MathProg, you can define binary variables as follows:

```
var x, binary;  
var y, binary;
```