





# 4.1 Short introduction into graph theory

# Example: Lewig Adelburg



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4.2 Representation of graphs in OPL

4.3 OPL: custom tuples as data structure

4.4 OPL: conditional operators







## 4.2 Representation of graphs in OPL

# Sequence dependent production problem

## Index sets:

$I$  set of products

$R$  set of resources

## Parameters:

$p_i$  price of product  $i \in I$

$c_r$  capacity of resource  $r \in R$

$v_{ri}$  capacity consumption of product  $i \in I$  on resource  $r \in R$

$E$  set of edges in the sequence graph

## Decision variables:

$x_i$  production quantity of product  $i \in I$

## Modellbeschreibung:

$$\max \sum_{i \in I} p_i \cdot x_i$$

$$\text{s.t.} \quad \sum_{i \in I} v_{ri} \cdot x_i \leq c_r \quad \forall r \in R \quad (\text{I})$$

$$x_i \geq \sum_{(i,j) \in E} x_j \quad \forall i \in I \quad (\text{II})$$

$$x_i \geq 0 \quad \forall i \in I$$

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## 4.3 OPL: custom tuples as data structure















## 4.4 OPL: conditional operators





