1 Ammissibilità del Flusso

$$T = \begin{pmatrix} 1 & 3 \\ 2 & 4 \\ 2 & 5 \\ 4 & 6 \\ 5 & 3 \end{pmatrix}$$

$$x_T = \begin{pmatrix} 5 & 8 & 5 & 4 & 0 \end{pmatrix}$$

$$x = \begin{pmatrix} 0 & 5 & 8 & 5 & 9 & 4 & 0 & 0 & 0 \end{pmatrix}$$

$$\pi_T = \begin{pmatrix} 0 & -4 & 7 & 4 & 3 & 7 \end{pmatrix}$$

$$C_L^\pi = \begin{pmatrix} 13 \\ 4 \\ 5 \end{pmatrix}$$

$$C_U^\pi = 15$$

x_T ammissibile degenere $\quad$ π_T NON ammissibile NON degenere
FLUSSO NON OTTIMO

2 Primo passo del Simplesso

L'arco entrante per U vincente è $(p, q) = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$
Verso ORARIO $\curvearrowright$
$C^+ = ()$ $\quad C^- = \begin{pmatrix} 5 & 2 & 3 \\ 3 & 5 & 2 \end{pmatrix}$
$\theta^+ = \infty \quad \theta^- = 0 \quad \theta = 0$
L'arco uscente è $(r, s) = \begin{pmatrix} 5 \\ 3 \end{pmatrix}$
La nuova tripartizione è: $T = \begin{pmatrix} 1 & 2 & 2 & 4 & 3 \\ 3 & 4 & 5 & 6 & 2 \end{pmatrix}$ $\quad L = \begin{pmatrix} 1 & 5 & 5 & 5 \\ 2 & 4 & 6 & 3 \end{pmatrix}$ $\quad U =$
$()$

$$x_{\text{finale}} = \begin{pmatrix} 0 & 5 & 8 & 5 & 9 & 4 & 0 & 0 & 0 \end{pmatrix}$$

3 Cammini minimi:

$N = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \end{pmatrix}$ $\quad p = \begin{pmatrix} 0 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}$ $\quad \pi = \begin{pmatrix} 0 & \infty & \infty & \infty & \infty & \infty \end{pmatrix}$

$N = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 \end{pmatrix}$ $\quad p = \begin{pmatrix} 0 & 1 & 1 & -1 & -1 & -1 \end{pmatrix}$ $\quad \pi = \begin{pmatrix} 0 & 9 & 7 & \infty & \infty & \infty \end{pmatrix}$

$N = \begin{pmatrix} 2 & 3 & 4 & 5 & 6 \end{pmatrix}$ $\quad p = \begin{pmatrix} 0 & 1 & 1 & -1 & -1 & -1 \end{pmatrix}$ $\quad \pi = \begin{pmatrix} 0 & 9 & 7 & \infty & \infty & \infty \end{pmatrix}$

$N = \begin{pmatrix} 2 & 4 & 5 & 6 \end{pmatrix}$ $\quad p = \begin{pmatrix} 0 & 1 & 1 & 2 & 2 & -1 \end{pmatrix}$ $\quad \pi = \begin{pmatrix} 0 & 9 & 7 & 17 & 16 & \infty \end{pmatrix}$

$N = \begin{pmatrix} 4 & 5 & 6 \end{pmatrix}$ $\quad p = \begin{pmatrix} 0 & 1 & 1 & 2 & 2 & 5 \end{pmatrix}$ $\quad \pi = \begin{pmatrix} 0 & 9 & 7 & 17 & 16 & 25 \end{pmatrix}$

$$N = \begin{pmatrix} 4 & 6 \end{pmatrix} \quad p = \begin{pmatrix} 0 & 1 & 1 & 2 & 2 & 4 \end{pmatrix} \quad \pi = \begin{pmatrix} 0 & 9 & 7 & 17 & 16 & 20 \end{pmatrix}$$

$$x = \begin{pmatrix} 4 & 1 & 2 & 1 & 0 & 1 & 0 & 0 & 0 \end{pmatrix}$$

4 Flusso Massimo con Ford-Falkerson

4.1

$$Q = 1 \quad p = \begin{pmatrix} 0 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = \begin{pmatrix} 2 & 3 \end{pmatrix} \quad p = \begin{pmatrix} 0 & 1 & 1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = \begin{pmatrix} 3 & 4 & 5 \end{pmatrix} \quad p = \begin{pmatrix} 0 & 1 & 1 & 2 & 2 & -1 \end{pmatrix}$$

$$Q = \begin{pmatrix} 4 & 5 \end{pmatrix} \quad p = \begin{pmatrix} 0 & 1 & 1 & 2 & 2 & -1 \end{pmatrix}$$

$$\text{Cammino aumentante} = \begin{pmatrix} 1 & 2 & 4 & 6 \end{pmatrix}$$

$$\text{A aumentanti} = \begin{pmatrix} 1 & 2 \\ 2 & 4 \\ 4 & 6 \end{pmatrix} \quad Residui = \begin{pmatrix} 7 \\ 10 \\ 8 \end{pmatrix} \quad \delta = 7 \quad v = 7$$

$$x = \begin{pmatrix} 7 & 0 & 7 & 0 & 0 & 7 & 0 & 0 & 0 \end{pmatrix}$$

4.2

$$Q = 1 \quad p = \begin{pmatrix} 0 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = 3 \quad p = \begin{pmatrix} 0 & -1 & 1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = 2 \quad p = \begin{pmatrix} 0 & 3 & 1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = \begin{pmatrix} 4 & 5 \end{pmatrix} \quad p = \begin{pmatrix} 0 & 3 & 1 & 2 & 2 & -1 \end{pmatrix}$$

$$\text{Cammino aumentante} = \begin{pmatrix} 1 & 3 & 2 & 4 & 6 \end{pmatrix}$$

$$\text{A aumentanti} = \begin{pmatrix} 1 & 3 \\ 2 & 4 \\ 3 & 2 \\ 4 & 6 \end{pmatrix} \quad Residui = \begin{pmatrix} 5 \\ 3 \\ 9 \\ 1 \end{pmatrix} \quad \delta = 1 \quad v = 8$$

$$x = \begin{pmatrix} 7 & 1 & 8 & 0 & 1 & 8 & 0 & 0 & 0 \end{pmatrix}$$

4.3

$$Q = 1 \quad p = \begin{pmatrix} 0 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = 3 \quad p = \begin{pmatrix} 0 & -1 & 1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = 2 \quad p = \begin{pmatrix} 0 & 3 & 1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = 5 \quad p = \begin{pmatrix} 0 & 3 & 1 & -1 & 2 & -1 \end{pmatrix}$$

$$\text{Cammino aumentante} = \begin{pmatrix} 1 & 3 & 2 & 5 & 6 \end{pmatrix}$$

$$\text{A aumentanti} = \begin{pmatrix} 1 & 3 \\ 2 & 5 \\ 3 & 2 \\ 5 & 6 \end{pmatrix} \quad Residui = \begin{pmatrix} 4 \\ 10 \\ 8 \\ 7 \end{pmatrix} \quad \delta = 4 \quad v = 12$$

$$x = \begin{pmatrix} 7 & 5 & 8 & 4 & 5 & 8 & 0 & 0 & 4 \end{pmatrix}$$

4.4

$$Q = 1 \quad p = \begin{pmatrix} 0 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

$$Q = \varnothing \quad p = \begin{pmatrix} 0 & -1 & -1 & -1 & -1 & -1 \end{pmatrix}$$

$$N_s = 1 \quad N_t = \begin{pmatrix} 2 & 3 & 4 & 5 & 6 \end{pmatrix}$$