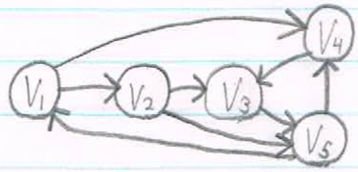
MATH 3802 Tutorial Three:

Tutorial:



②

$T=\{e_1,e_4,e_6,e_8\}$

③

I) $T=\{e_1,e_4,e_7,e_8\}$, $N=A\setminus T=\{e_2,e_3,e_5,e_6\}$

II) $y_5=0$

$e_8=y_5-y_4=1 \Rightarrow y_4=-1$

$e_6=y_2-y_5=1 \Rightarrow y_2=1$

$e_1=y_1-y_2=1 \Rightarrow y_3=0$ $\quad e_4=y_2-y_3=1 \Rightarrow y_3=0$

III)

$e_2: y_1-y_4=2-(-1)=3>0$

IV) $C=\{e_1,e_2,e_6,e_8\}$

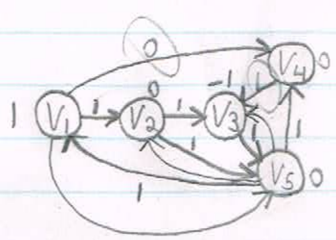
V) Not a dicycle

VI) $R=\{e_1,e_6,e_8\}$, $\theta=\min\{1,0,0\}=0$

VII) update: $T=\{e_1,e_2,e_4,e_6\}$

Problems:

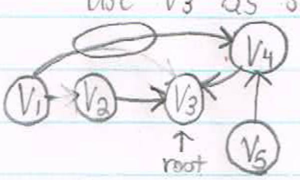
① Ask for the aux. network of G,b with V_5 as the root:

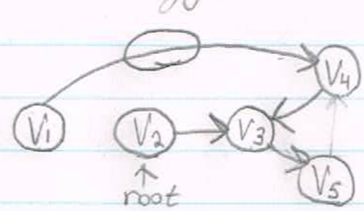


Arc from V_5 to V_2 & V_3 & V_1 to V_5 to Complete Aux. Network

② trees determined by x^* but NOT strongly feasible:

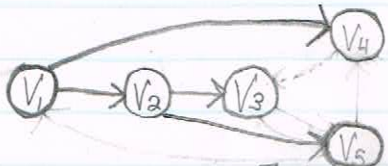
use V_3 as source:





In both cases, the path e_2 with weight zero leads to the root

(3)



I) $T=\{e_1,e_2,e_4,e_6\}$, $N=A\setminus T=\{e_3,e_5,e_7,e_8\}$

II) $y_5=0$

$e_6: y_2-y_5=1$ So $y_2=1$

$e_4: y_2-y_3=1$ So $y_3=-2$

$e_1: y_1-y_2=1 \Rightarrow y_1=2$

$e_2: y_1-y_4=0 \Rightarrow y_4=2$

III)

$e_3: y_5-y_1=0-2=-2 \not> 1$

$e_5: y_4-y_3=2-(-2)=4>1$

IV) $C=\{e_1,e_2,e_4,e_5\}$

V) Not a dicycle

VI) $R=\{e_1,e_2,e_4\}$, $\theta=\min\{1,0,1\}=0$ thus $r=e_2$

VII) update: $T=\{e_1,e_4,e_5,e_6\}$

(Note: x^* is the Same) $\rightarrow x^*=[1\,0\,0\,1\,0\,0\,0\,0]^T$