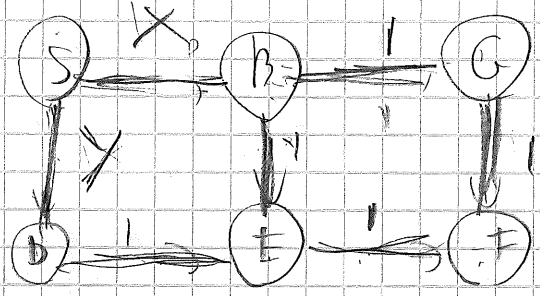
Ex 1 — 13/06/2017 — DFS first



$S \to B \to G$

$COST = X + 1$

Q1

A*

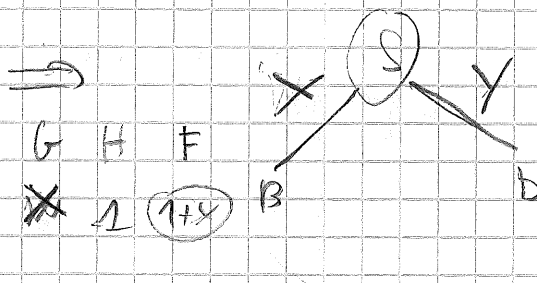
G H F

H: 3 — H: 2+5 — H: 1 — 0, 2, 2

$1 + X > 3 + Y$

$X > Y + 2$

$Y = 1 \quad X = 4$



G H F

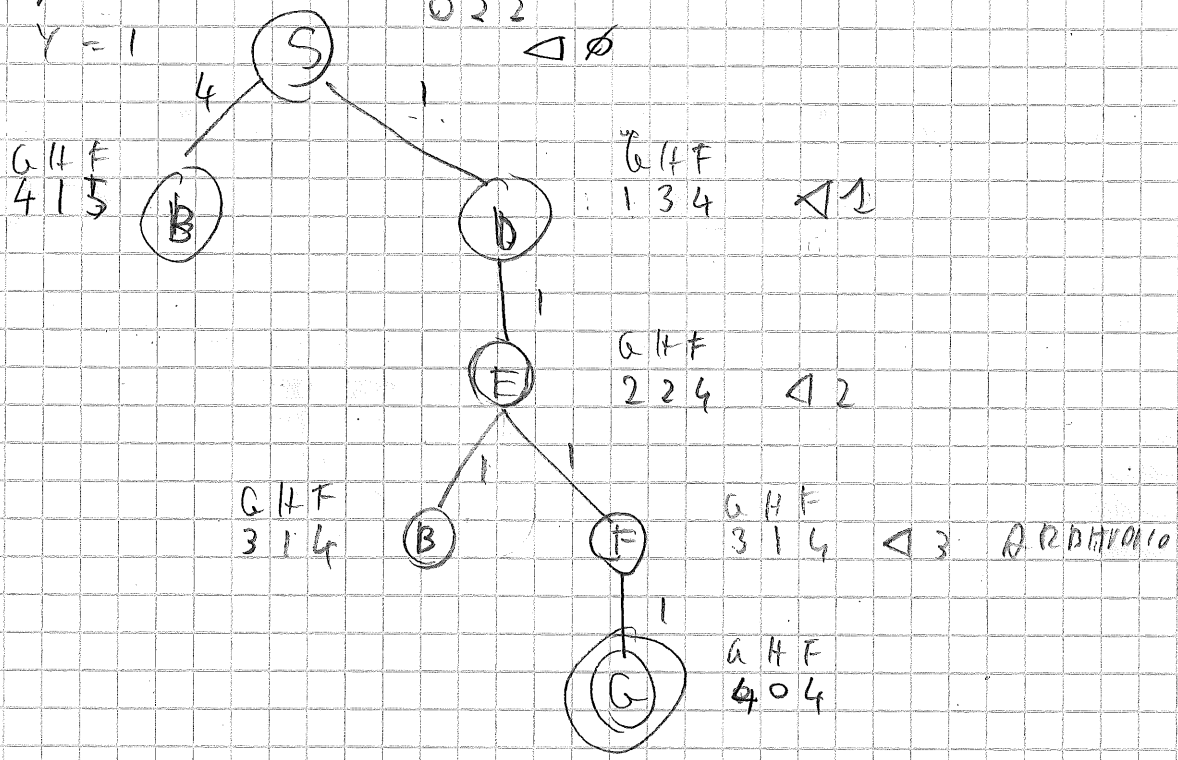
X 1 (1+X)

G H F

Y 3 (3+Y)

$X = 4$

$Y = 1$



Q2

a) IS H ADMISS.

	S	B	G	D	E	F
H_1	2	1	0	3	2	1
H^*	4	1	0	3	2	1

$\Rightarrow$

$H_m \leq H_m^* \quad \forall m \in M$

b) IS H CONSIST.

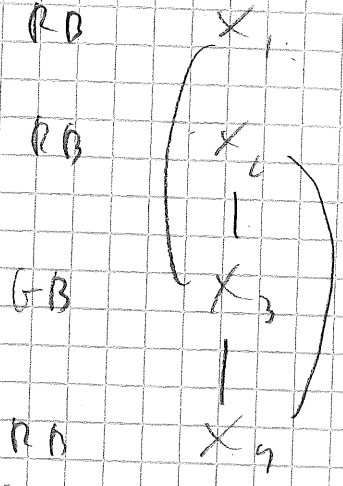
$H_m \leq C_{m,m'} + H_{m'} \Rightarrow$

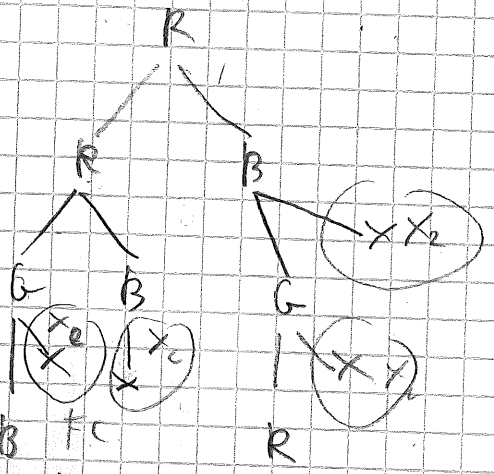
$H_m - H_{m'} \leq C_{m,m'}$

SINCE THE H_m IS NOT OF FIXED TO 0 ONE THIS CAN NEVER INCREASE

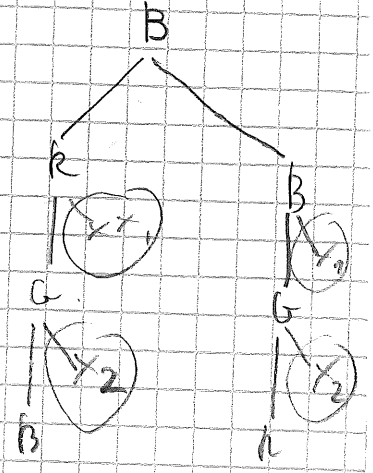
Ex 2 Q1 NFT is cons. YES

BT





Sol 1 Sol 2



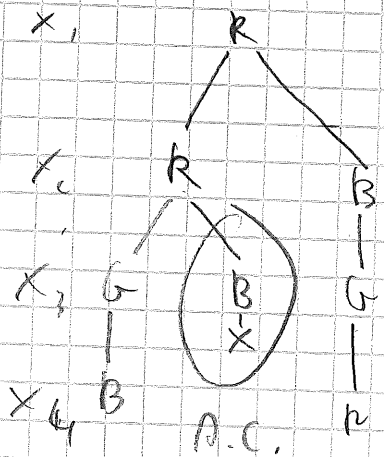
F.C.

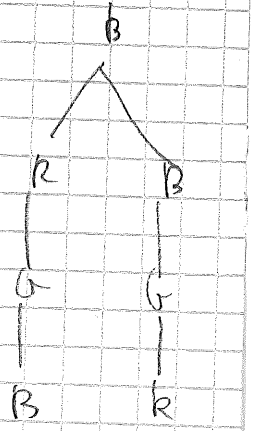
RB RB GB RB

X_1 X_1 — X_2 — X_3

Q2

R	RB	GB	RB	
R	R	GB	B	
R	R	G	B	Sol 1
R	R	B	X	
R	B	G	R	Sol 2
B	RB	G	RB	
B	R	G	B	Sol 3 -
B	B	G	R	Sol 4 -



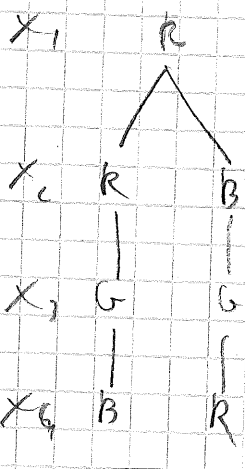


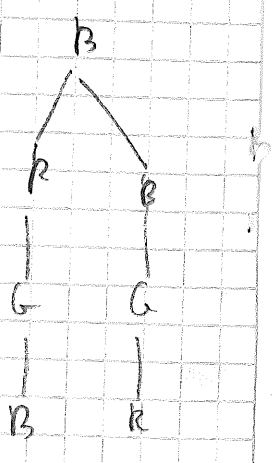
Q3

RB RB GB RB A.C.

X_1 X_1 — X_2 — X_3 — X_4

R	RB	GB	RB	No change
R	R	G	B	NEW(X_2, X_4)
R	B	G	R	NEW(X_4, X_2)
R	B	G	R	NEW(X_3, X_1)





RD RB GB RB

X_1 X_2 X_3 X_4

NEW(X_3, X_4)

B RB G RB

B R G B

NEW(X_3, X_2)

B B G R

NEW(X_4, X_2)

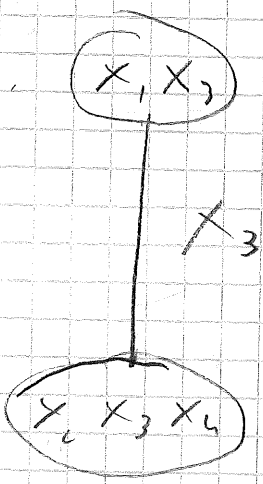
EX 3

Q1 STATE WHETHER THIS NET WORK IS ACYCLIC

PRIMAL NODES

MAXIMUM CARDINALITY MATCH (CONSIST IN)

	ARC	
X_1	ϕ	ok
X_3	X_1	ok
X_2	X_3	ok
X_4	X_2, X_3	ok

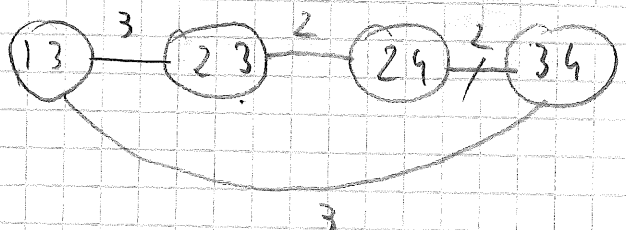


$\Rightarrow$ NO CONSTI. WITH X_2 X_3 X_4

NOT COMPL

GRAPH IS CYCLIC

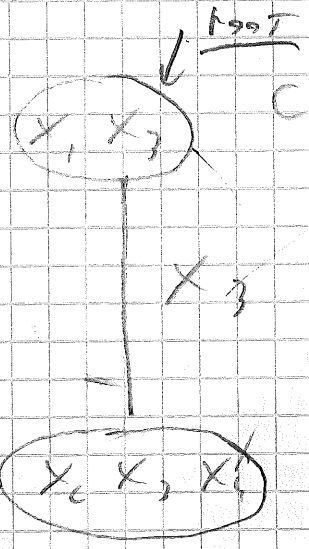
DUAL NODES



NOT ACYCLIC

Q2 SOLVE THIS NET BY USING METHOD OF VARIABLE ELIMINATION (TREE OR JTC)

MUST USE JTC



SOLUTIONS

X_1	$X_2 - X_3$		X_4
R	R	G	B
B	R	G	B
R	B	G	R
B	B	G	R

C_2

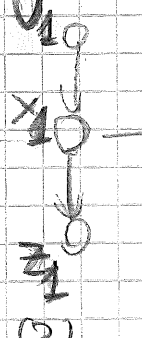
X_2	X_3	X_4
R	G	B
B	G	R

C_1

X_1	X_1
R	R
G	G
~~B~~	~~B~~

REV (C_1, C_2) = ok

EX 4



Q1) $P(X_2 \mid U_2, X_1) \overset{?}{=} P(X_2 \mid U_2, U_1, X_1, Z_1)$

[LOCAL SEMANTICS]

YES X_2 COND IND. OF NON DESC (U_1, Z_1) GIVEN ITS PARENTS (U_2, X_1)

Q2) $P(Z_2 \mid X_2) \overset{?}{=} P(Z_2 \mid X_2, X_1, U_2, U_1, Z_1)$ [MARKOV BLANKET]

YES $MB(Z_2) = X_2, Z_2$ COND INDEP GIVEN $MB[X_2]$ FROM ALL OTHER NODES $[U_2, U_1, X_1, Z_1)$

Q3) # PAR.

$P(\_\_) = P(U_1)\, P(U_2)\, P(X_1 \mid U_1)\, P(X_2 \mid U_2, X_1)\, P(Z_1 \mid X_1)\, P(Z_2 \mid X_2)$

$16 = 1 \quad 1 \quad 2 \quad 4 \quad 4 \quad 4$