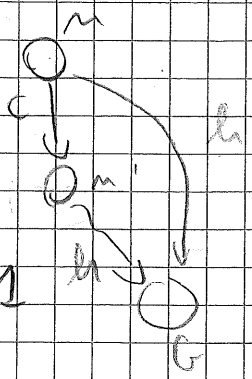
Ex 2 (25) 27/06/2018

1) MANHATTAN HEURISTIC IS CONSISTENT

CONSISTENT $H(n) \leq H(n') + C(n, n')$

$H(n) - H(n') \leq C(n, n')$



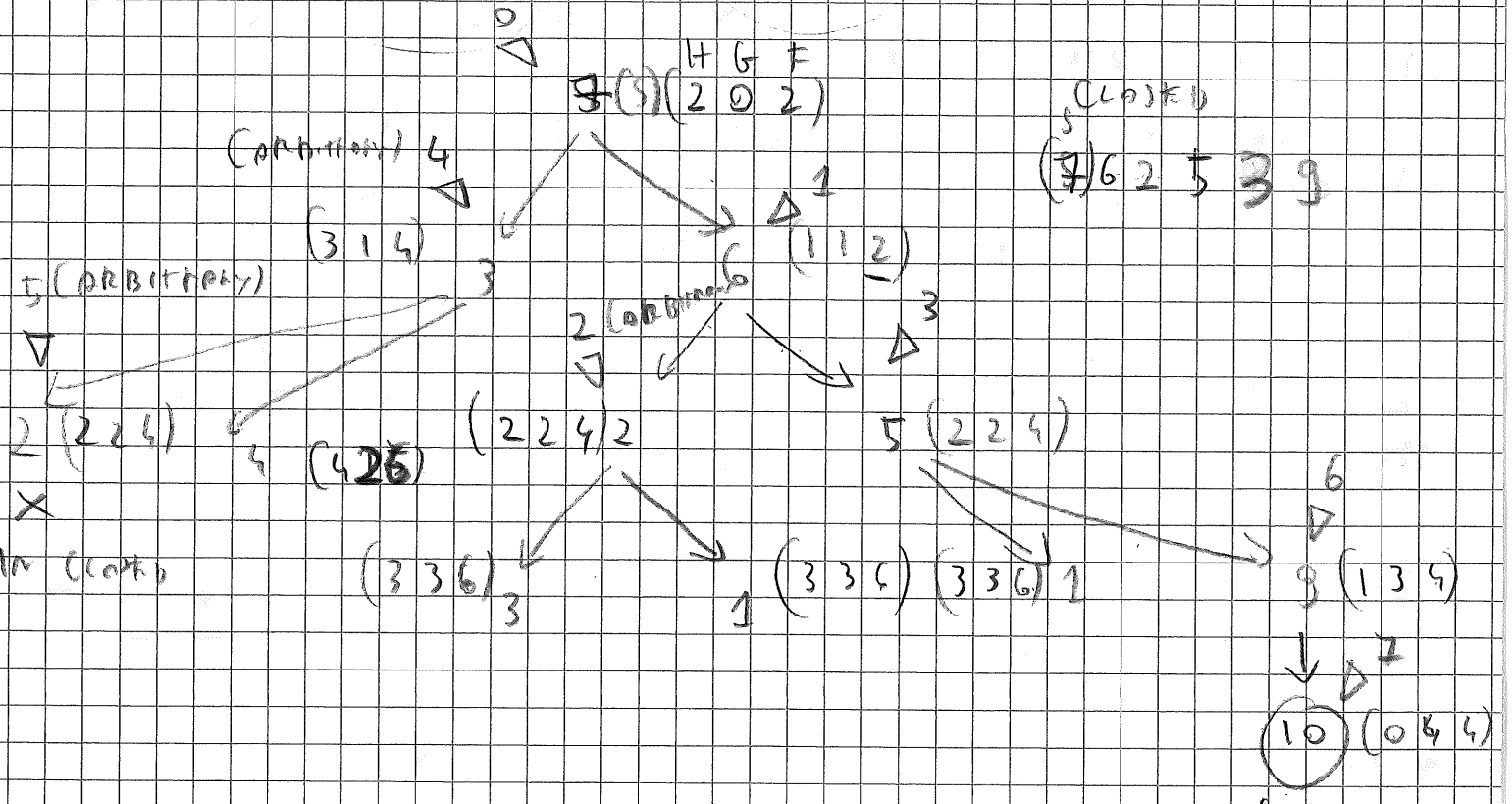
FOR MANHATTAN DISTANCE $H(n) - H(n') \leq 1$

AND $C(n, n') = 1$

↓

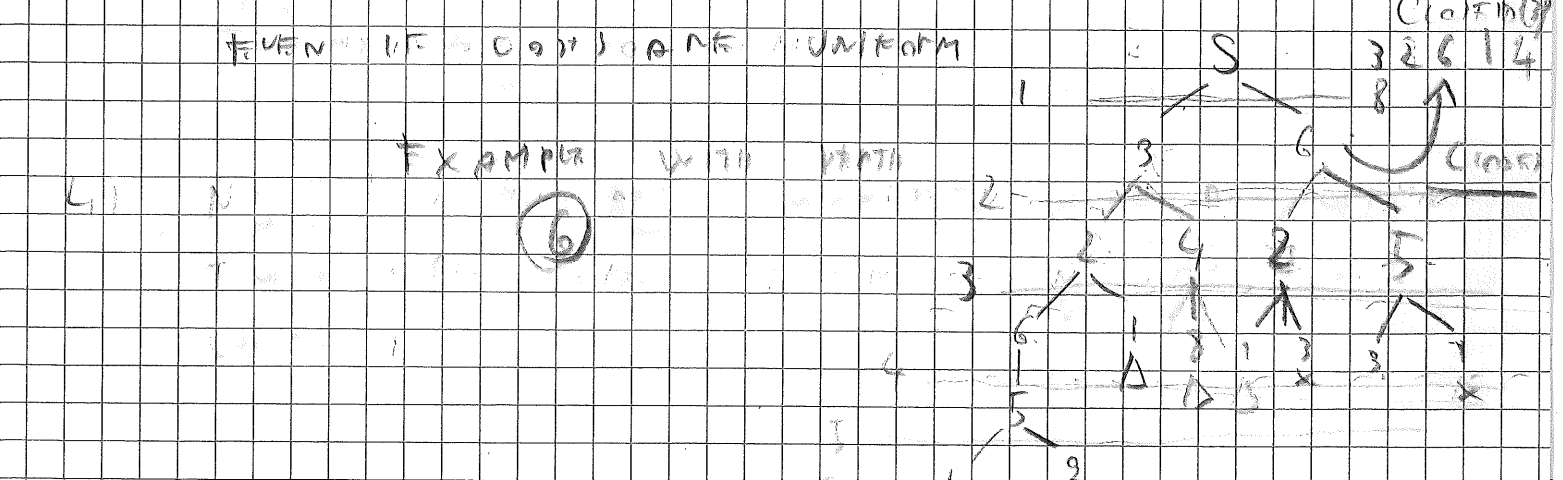
MANHATTAN DISTANCE OF A SUCCESSOR NODE CAN NEVER BE MORE THAN ONE UNIT

2) BEST USE GRAPH SEARCH, BECAUSE MANHATTAN IS CONSISTENT.



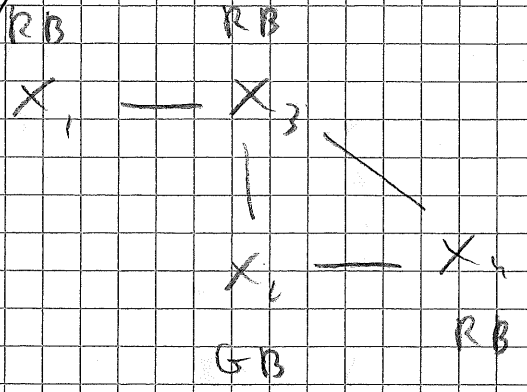
3) NO, IDS IS NOT GUARANTEED TO BE OPTIMAL WHEN USING GRAPH SEARCH IT WILL BE OPTIMAL IF COST IS UNIFORM

EXAMPLE WITH DEPTH



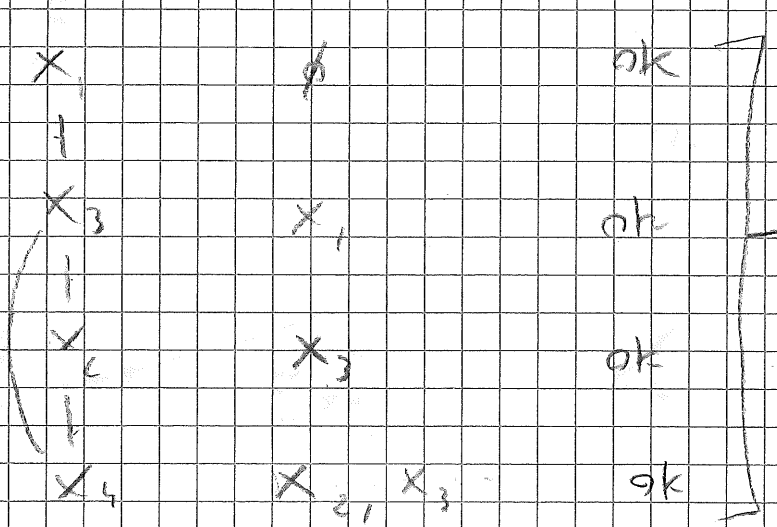
41 No, IDJ is guaranteed to return the minimum cost path if using time stamp and costs are uniform.

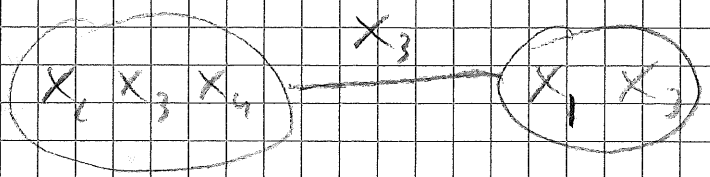
Ex 4 (25)



1) Using Primal based

Max cost order from X_1

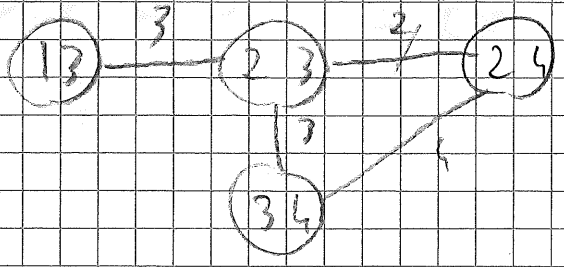




Graph is not conformal

Net is not decycle

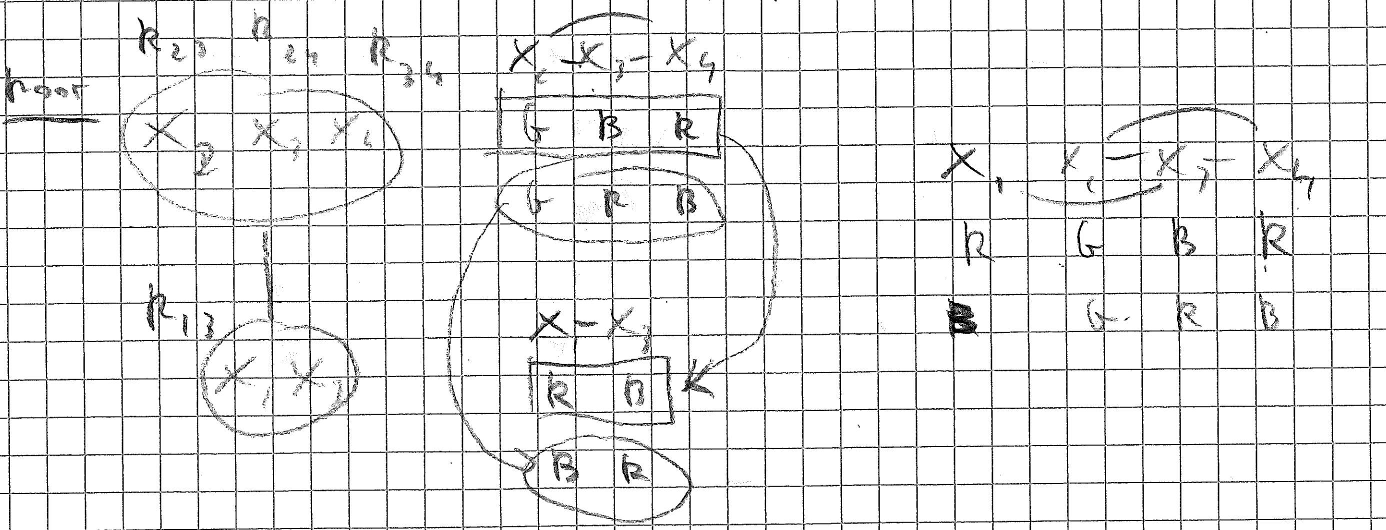
Using dual path



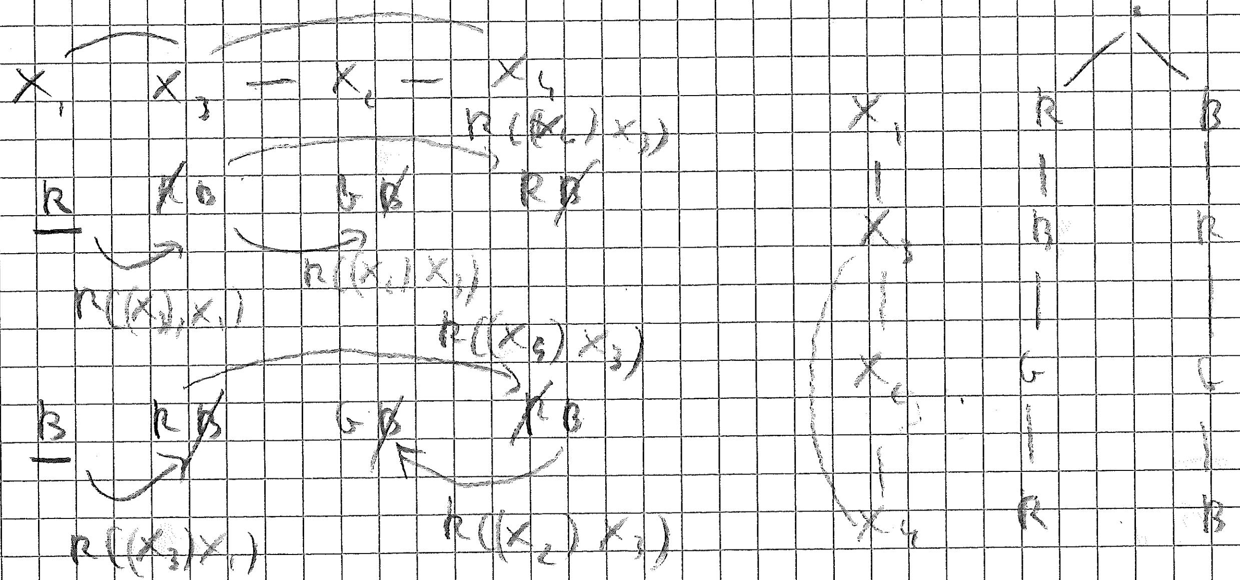
Because 2 we have not input 1 on path from 23 to 24

Net is not decycle

2) USE JTC BECAUSE NET IS NOT ACYCLIC



3)



EX 3 (25)

1) NO, U_2 IS NOT COND INDEP FROM Z_2 GIVEN X_1 ($P(U_2 | X_1, Z_2) \neq P(U_2 | X_1)$)

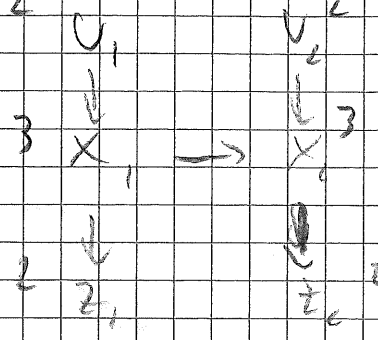
LOCAL SEM: Z_2 IS A DESCENDANT OF U_2

HENCE CAN NOT APPLY LOCAL SEM

MB: $MB(U_2) = \emptyset \cup X_2 \cup X_1 = (X_1, X_2)$ (P, C, CP)

X_2 IS NOT IN THE CONDITIONING VARIABLES (WE HAVE ONLY X_1) (P

2)



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

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

$$1 + 1 + 4 + 12 + 3 + 3$$

$$(k-1) \quad (k-1) \quad (N-1)\,k \quad (N-1)\,k \quad (k-1)\,N \quad (k-1)N$$
$$(2-1) \quad (2-1) \quad (3-1)\,2 \quad (3-1)\,2\,3 \quad (2-1)\,3 \quad (2-1)3$$

(24)

Ex 4 (25)

1) optimal action is

$$\text{ARG max}_a \sum_{s'} T(s,a,s')\left[R(s,a,s') + \gamma V(s')\right]$$

for (3,2)

UP	$0.1(-0.04 + .660) + .8(-0.04 + .312) + .1(-0.04 + 1)$
LEFT	$0.8(-0.04 + .660) + .1(-0.04 + .312) + .1(-0.04 + .611)$
right	$.1(-0.04 + .312) + .8(-0.04 + 1) + .1(-.04 + .611)$
down	$.1(-.04 + .660) + .8(-.04 + .611) + .1(-.04 + 1)$

UP	.6556
LEFT	.6403
right	-0.6877
down	.4148

UP

Ex 4 question 1 (25)

For (3,1)

UP = .04 + (.8 × .660 + .1 × .655 + .1 × .388)

LEFT = .04 + (.8 × .655 + .1 × .660 + .1 × .611)

DOWN = .04 + (.8 × .611 + .1 × .655 + .1 × .388)

RIGHT = .04 + (.8 × .388 + .1 × .660 + .1 × .611)

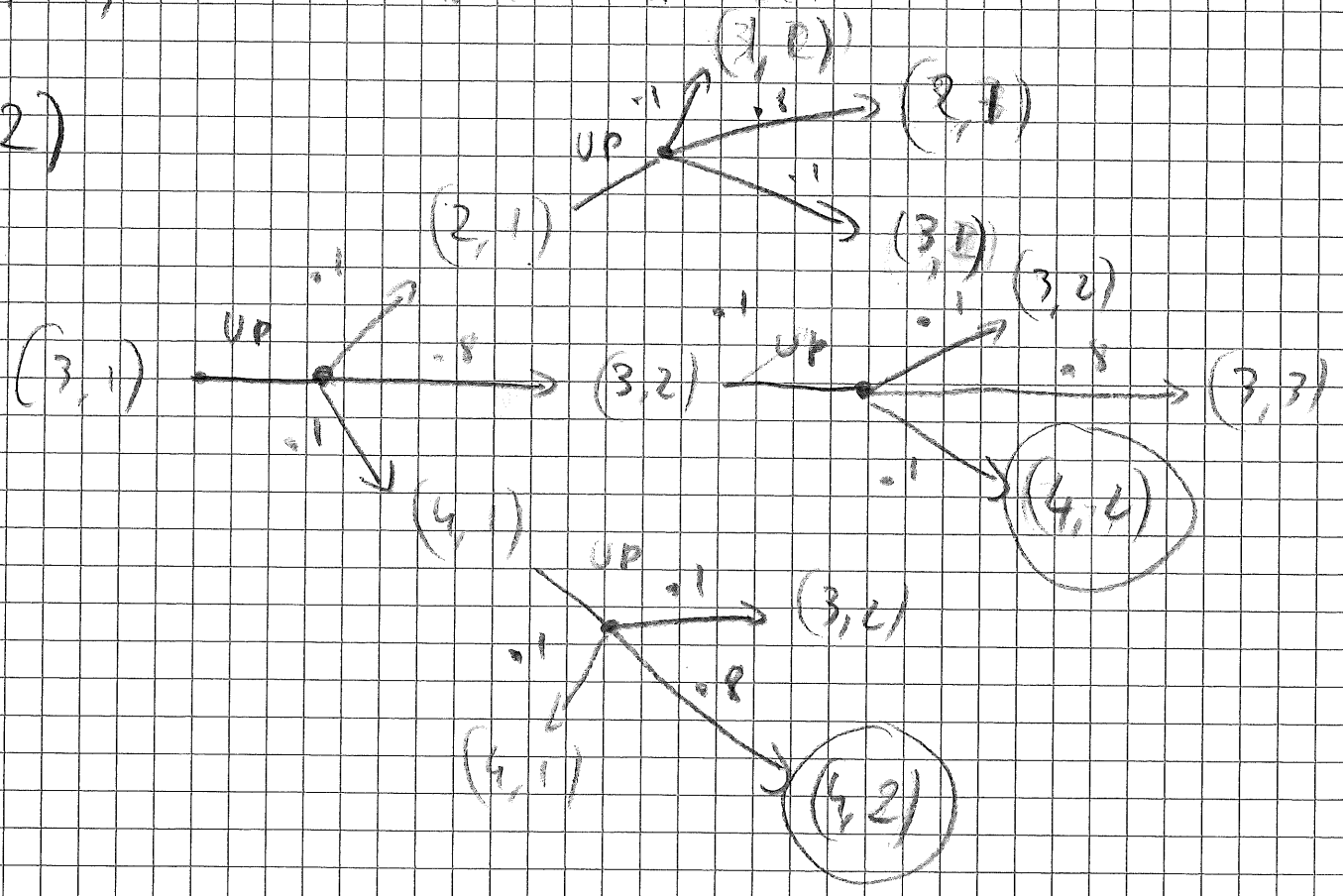
UP .5523

LEFT .6111

DOWN .5531

RIGHT .3915

2) YES, ACTIONS ARE OPTIMAL.



PROBABILITY OF ENDING IN (4,2) GIVEN UP, UP

(.8 × .1) + (.1 × .8) = .16