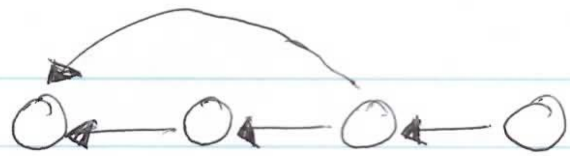
Kha Le

1. r(G): 

(a) $\langle 2,1,1,0\rangle$

(b) $\langle 2,1,1,0\rangle$

(c) $\langle 3,2,2,1\rangle$

(d) #(paths length 2) = 3

#(paths length 3) = 1

(e) $\langle (2,0),(1,2),(1,1),(0,1)\rangle$

- None of (a)-(e) help distinguih G and r(G).

- $4\times3\times2\times1 = 24$ different labeled digraphs

2. (a) their outdeg-sequence should be the same

(b) their indeg-sequence should be the same

(c) their (total) degree-sequence should be the same

- Yes.
- Yes.
- the degreePair sequence is the most powerful.

~~3. Maximum number of links on anti-symmetric relation is when there is only one link between every node on the digraph. This is C(n,2) because there is two nodes for every link.~~ ~~$C(n,2) = \frac{n(n+1)}{2}$ and therefore max #(links) $= \frac{n(n+1)}{2}$.~~

~~Verification: $\frac{2(2+1)}{2} = 3$~~

3. Maximum number of links on anti-symmetric relation is when there is only one link between every distinct node on the digraph and each node is linked to itself. This is $C(n,2)$ for every link between two nodes and n for every node linked to itself. This is $C(n,2)+n$ which is $C(n,2) = \frac{n(n-1)}{2} + n = \frac{n(n+1)}{2}$.

<u>Verification</u>: $\frac{2(2+1)}{2} = 3$