Social Network Analysis
Assignment - 1

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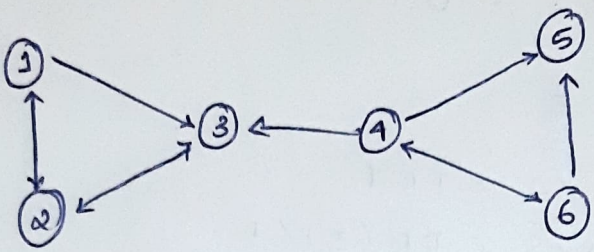
CSE - B

1.



Consider page rank score for each node as 1.0

$$PR(1) = PR(2) = PR(3) = PR(4) = PR(5) = PR(6) = 1.0$$

For ~~a~~ iteration 1:

$PR(1) = PR(2)/2 = 1.0/2 = 0.5$

$PR(2) = PR(1)/2 + PR(3)/1$
$= 0.5 + 1.0 = 1.5$

$PR(3) = PR(1)/2 + PR(2)/2 + PR(4)/3$
$= 0.5 + 1.0 + 0.34$
$= 1.84$

$PR(4) = PR(6)/2 = 0.5$

$PR(5) = PR(4)/3 + PR(6)/2$
$= 0.34 + 0.5$
$= 0.84$

$PR(6) = PR(4)/3$
$= 0.34$

For iteration 2:

$PR(1) = PR(2)/2 = 1.5/2 = 0.75$

$PR(2) = PR(1)/2 + PR(3)/1$
$= 0.75/2 + 1.84/1$
$= 0.375 + 1.84 = 2.215$

$PR(3) = PR(1)/2 + PR(2)/2 + PR(4)/3$
$= 0.375 + 1.107 + 0.166 = 1.648$

$PR(4) = PR(6)/2 = 0.17$

$PR(5) = PR(4)/3 + PR(6)/2$

$= 0.17/3 + 0.34/2$

$= 0.056 + 0.17 = 0.226$

$PR(6) = PR(4)/3 = 0.17/3 = 0.056$

For iteration 3,

$PR(1) = PR(2)/2 = 1.107$

$PR(2) = PR(1)/2 + PR(3)/1$

$= 0.553 + 1.648 = 1.201$

$PR(3) = PR(1)/2 + PR(2)/2 + PR(4)/3$

$= 0.553 + 0.600 + 0.056$

$PR(4) = PR(6)/2 = 0.028$

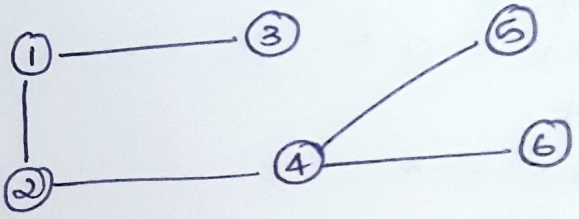
$PR(5) = PR(4)/3 + PR(6)/2$

$= 0.009 + 0.028 = 0.037$

$PR(6) = PR(4)/3 = 0.009$

The iterations continue till the values converge.

2.



Consider importance of each nodes as 1

Importance(1) = Imp(2) = Imp(3) = Imp(4)

= Imp(5) = Imp(6) = 1

In iteration 1,

$Imp(1) = Imp(2)/2 + Imp(3)/1$

$= 0.5 + 1 = 1.5$

$Imp(2) = Imp(1)/2 + Imp(4)/3$

$= 0.5 + 0.34 = 0.84$

$Imp(3) = Imp(1)/2 = 0.5$

$Imp(4) = Imp(2)/2 + Imp(5)/1 + Imp(6)/1$

$= 0.5 + 1 + 1 = 2.5$

$Imp(5) = Imp(4)/3$

$= 0.34$

$Imp(6) = Imp(4)/3$

$= 0.34$

Node 4 has highest importance of 2.5