

# eisenberg-noe-2001-debt-model-with-default-costs

November 20, 2021

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## DEBT MODEL WITH DEFAULT COSTS

ALPHA = 0.1 and BETA = 0.9

Running Debt Model to find Lowest Clearing Vector in MANUAL mode with 3 nodes...

Scenario 5 - Firm B defaults in first round, Firm A in second round, MODE ==  
'MANUAL', NUM\_AGENTS = 3, NOMINAL\_LIABILITY\_MATRIX =  
np.array([[0,2,9],[7,0,9],[3,1,0]]), OPERATING\_CASHFLOW\_BEFORE\_SHOCK = [11, 8,  
12], ALPHA = 0.1, BETA = 0.9  
Shock value is 8

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## AGENT LABELS

Agent labels ['A', 'B', 'C']

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## NOMINAL LIABILITY MATRIX Data Frame

i.e. what node i expects (row) to pay node j (column)...

	A	B	C
A	0	2	9
B	7	0	9
C	3	1	0

Nominal liabilities for each node:

Liability of Node A to Node B is 2  
Liability of Node A to Node C is 9  
Liability of Node B to Node A is 7  
Liability of Node B to Node C is 9  
Liability of Node C to Node A is 3  
Liability of Node C to Node B is 1

NOMINAL LIABILITY MATRIX TRANSPOSED Data Frame  
i.e. what node j expects to receive from i...

	A	B	C
A	0	7	3
B	2	0	1
C	9	9	0

Node A expects to receive 7 from Node B  
Node A expects to receive 3 from Node C  
Node B expects to receive 2 from Node A  
Node B expects to receive 1 from Node C  
Node C expects to receive 9 from Node A  
Node C expects to receive 9 from Node B

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#### OPERATING CASH FLOW VECTOR

Exogenous cash flow for Node A: 3  
Exogenous cash flow for Node B: 0  
Exogenous cash flow for Node C: 4  
[3, 0, 4]

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#### CALCULATING RELATIVE LIABILITIES FOR EACH NODE

##### \*\*\*Node A\*\*\*

###### - Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

###### - Total obligations for Node A

Total Obligation Vector updated in round 1 for Node A with value 11.0  
Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

###### - Relative Liabilities of Node A

Relative Liability of Node A to Node B is 0.181818181818182  
Relative Liability of Node A to Node C is 0.8181818181818182  
Sum of Relative Liabilities for Node A is 1.0

##### \*\*\*Node B\*\*\*

###### - Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0  
Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

- Total obligations for Node B  
 Total Obligation Vector updated in round 1 for Node B with value 16.0  
 Total nominal liabilities for Node B (i.e.  $\bar{p}_2$ ) is 16.0

- Relative Liabilities of Node B  
 Relative Liability of Node B to Node A is 0.4375  
 Relative Liability of Node B to Node C is 0.5625  
 Sum of Relative Liabilities for Node B is 1.0

\*\*\*Node C\*\*\*

- Liabilities for Node C  
 Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0  
 Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0

- Total obligations for Node C  
 Total Obligation Vector updated in round 1 for Node C with value 4.0  
 Total nominal liabilities for Node C (i.e.  $\bar{p}_3$ ) is 4.0

- Relative Liabilities of Node C  
 Relative Liability of Node C to Node A is 0.75  
 Relative Liability of Node C to Node B is 0.25  
 Sum of Relative Liabilities for Node C is 1.0

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 RELATIVE LIABILITY MATRIX Data Frame

	A	B	C
A	0.0000	0.181818	0.818182
B	0.4375	0.000000	0.562500
C	0.7500	0.250000	0.000000

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 RELATIVE LIABILITY MATRIX Data Frame SANITY CHECK

	A	B	C	Relative Liability Total	CORRECT VALUE?
A	0.0000	0.181818	0.818182	1.0	True
B	0.4375	0.000000	0.562500	1.0	True
C	0.7500	0.250000	0.000000	1.0	True

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 RELATIVE LIABILITY MATRIX TRANSPOSED Data Frame

i.e. what node i (row) expects to receive from node j (column) in relative terms...

	A	B	C
A	0.000000	0.4375	0.75
B	0.181818	0.0000	0.25
C	0.818182	0.5625	0.00

\*\*\*Expected nominal payments in for Node A - both proportion and total amount\*\*\*

Node A expects to receive proportion 0.4375 from Node B

Node A expects to receive proportion 0.75 from Node C

Total payments in to Node A is 3.0 in round 1.

\*\*\*Expected nominal payments in for Node B - both proportion and total amount\*\*\*

Node B expects to receive proportion 0.18181818181818182 from Node A

Node B expects to receive proportion 0.25 from Node C

Total payments in to Node B is 1.5454545454545454 in round 1.

\*\*\*Expected nominal payments in for Node C - both proportion and total amount\*\*\*

Node C expects to receive proportion 0.8181818181818182 from Node A

Node C expects to receive proportion 0.5625 from Node B

Total payments in to Node C is 2.4545454545454546 in round 1.

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START OF ROUND 1

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TOTAL OBLIGATION VECTOR - round 1

i.e. total nominal obligations for each node i.e.  $\bar{p}_i$ ...

Total nominal obligation for Node A (i.e.  $\bar{p}_1$ ): 11.0

Total nominal obligation for Node B (i.e.  $\bar{p}_2$ ): 16.0

Total nominal obligation for Node C (i.e.  $\bar{p}_3$ ): 4.0

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TOTAL PAYMENT MADE PER NODE - round 1

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Total payments in to Node A is 3.0 in round 1.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

- Total obligations for Node A

Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.0]$

Total payments in to Node A is 3.0 in round 1.

Total payments in to Node A is 3.0 in round 1.

Total payments in to Node A is 3.0 in round 1.

Round 1 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.0. Default loss for Node A is 3.0

- Total Dollar Payment Vector for round 1 and Node A

Total Dollar Payment Vector for round 1 and Node A updated with value 3.0

\*\*\*Node B\*\*\*

- Total payments in for Node B

Total payments in to Node B is 1.5454545454545454 in round 1.

- Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0

Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

- Total obligations for Node B

Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[16.0, 1.5454545454545454]$

Total payments in to Node B is 1.5454545454545454 in round 1.

Total payments in to Node B is 1.5454545454545454 in round 1.

Total payments in to Node B is 1.5454545454545454 in round 1.

Round 1 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.5454545454545454. Default loss for Node B is 0.15454545454545454

- Total Dollar Payment Vector for round 1 and Node B

Total Dollar Payment Vector for round 1 and Node B updated with value

1.3909090909090909

\*\*\*Node C\*\*\*

- Total payments in for Node C

Total payments in to Node C is 2.4545454545454546 in round 1.

- Liabilities for Node C

Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0

Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0

- Total obligations for Node C

Total nominal liabilities for Node C (i.e.  $p\_bar\_3$ ) is 4.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[4.0, 6.454545454545455]$

- Total Dollar Payment Vector for round 1 and Node C

Total Dollar Payment Vector for round 1 and Node C updated with value 4.0

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TOTAL PAYMENT VECTOR - round 1

Total payment by Node A (i.e.  $p_1$ ): 3.0

Total payment by Node B (i.e.  $p_2$ ): 1.3909090909090909

Total payment by Node C (i.e.  $p_3$ ): 4.0

[3.0, 1.3909090909090909, 4.0]

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UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 1

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Total payments in to Node A is 3.0 in round 1.

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.0

Equity Vector for round 1 and Node A

Equity Vector for round 1 and Node A updated with value 3.0 i.e. total cash flow 6.0 minus total payments out (liabilities) 3.0.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Total payments in to Node B is 1.5454545454545454 in round 1.

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is

1.3909090909090909

Equity Vector for round 1 and Node B

Equity Vector for round 1 and Node B updated with value 0.1545454545454545 i.e.

total cash flow 1.5454545454545454 minus total payments out (liabilities)  
1.3909090909090909.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Total payments in to Node C is 2.4545454545454546 in round 1.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 1 and Node C

Equity Vector for round 1 and Node C updated with value 2.454545454545455 i.e.

total cash flow 6.454545454545455 minus total payments out (liabilities) 4.0.

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EQUITY FOR EACH NODE - round 1

Equity for Node A: 3.0

Equity for Node B: 0.15454545454545454

Equity for Node C: 2.454545454545455

[3.0, 0.15454545454545454, 2.454545454545455]

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ROUND 1 DEFAULTERS

Node A has defaulted in round 1

{'A': True, 'B': True, 'C': False}

There are defaulters in this round (i.e. round 1), algorithm will proceed for  
another round.

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END OF ROUND 1

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START OF ROUND 2

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TOTAL OBLIGATION VECTOR - round 2

i.e. total nominal obligations for each node i.e. p\_bar\_i...

Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0

Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0

Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0

TOTAL PAYMENT MADE PER NODE - round 2

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.3909090909090909

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.608522727272727 in round 2.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.608522727272727]$

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.3909090909090909

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.608522727272727 in round 2.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.3909090909090909

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.608522727272727 in round 2.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.3909090909090909

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.608522727272727 in round 2.

Round 2 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.608522727272727. Default loss for Node A is 3.0608522727272724

- Total Dollar Payment Vector for round 2 and Node A

Total Dollar Payment Vector for round 2 and Node A updated with value  
3.5476704545454547



\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.0

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.5454545454545454 in round 2.

- Liabilities for Node B

Liability of Node B to Node A (i.e. P\_10) is 7.0

Liability of Node B to Node C (i.e. P\_12) is 9.0

Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0, 1.5454545454545454]

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.0

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.5454545454545454 in round 2.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.0

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.5454545454545454 in round 2.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.0

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.5454545454545454 in round 2.

Round 2 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.5454545454545454. Default loss for Node B is

0.15454545454545454

- Total Dollar Payment Vector for round 2 and Node B

Total Dollar Payment Vector for round 2 and Node B updated with value

1.3909090909090909

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.0

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is

1.3909090909090909

Total payments in to Node C is 3.236931818181818 in round 2.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P<sub>20</sub>) is 3.0

Liability of Node C to Node B (i.e. P<sub>21</sub>) is 1.0

Total nominal liabilities for Node C (i.e. p<sub>bar\_3</sub>) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0, 7.236931818181818]

- Total Dollar Payment Vector for round 2 and Node C

Total Dollar Payment Vector for round 2 and Node C updated with value 4.0

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TOTAL PAYMENT VECTOR - round 2

Total payment by Node A (i.e. p<sub>1</sub>): 3.5476704545454547

Total payment by Node B (i.e. p<sub>2</sub>): 1.3909090909090909

Total payment by Node C (i.e. p<sub>3</sub>): 4.0

[3.5476704545454547, 1.3909090909090909, 4.0]  
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UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 2

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p<sub>2</sub>) is 1.3909090909090909

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p<sub>3</sub>) is 4.0

Total payments in to Node A is 3.608522727272727 in round 2.

Total dollar payment (i.e. liabilities) by Node A (i.e. p<sub>1</sub>) is 3.5476704545454547

Equity Vector for round 2 and Node A

Equity Vector for round 2 and Node A updated with value 3.0608522727272724 i.e. total cash flow 6.608522727272727 minus total payments out (liabilities) 3.5476704545454547.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p<sub>1</sub>) is 3.0

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p<sub>3</sub>) is 4.0

Total payments in to Node B is 1.5454545454545454 in round 2.

Total dollar payment (i.e. liabilities) by Node B (i.e. p<sub>2</sub>) is

1.3909090909090909  
Equity Vector for round 2 and Node B  
Equity Vector for round 2 and Node B updated with value 0.15454545454545454 i.e.  
total cash flow 1.5454545454545454 minus total payments out (liabilities)  
1.3909090909090909.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.81818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.0  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.3909090909090909  
Total payments in to Node C is 3.236931818181818 in round 2.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 2 and Node C  
Equity Vector for round 2 and Node C updated with value 3.2369318181818176 i.e.  
total cash flow 7.236931818181818 minus total payments out (liabilities) 4.0.

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EQUITY FOR EACH NODE - round 2

Equity for Node A: 3.0608522727272724  
Equity for Node B: 0.15454545454545454  
Equity for Node C: 3.2369318181818176  
[3.0608522727272724, 0.15454545454545454, 3.2369318181818176]

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ROUND 2 DEFAULTERS

Node A has defaulted in round 2  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 2) are  
not identical, algorithm will proceed for another round.

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END OF ROUND 2

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START OF ROUND 3

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TOTAL OBLIGATION VECTOR - round 3

i.e. total nominal obligations for each node i.e.  $p_{bar_i}$   
Total nominal obligation for Node A (i.e.  $p_{bar_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{bar_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{bar_3}$ ): 4.0

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TOTAL PAYMENT MADE PER NODE - round 3

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.3909090909090909  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.608522727272727 in round 3.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{bar_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.608522727272727]$

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.3909090909090909  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.608522727272727 in round 3.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.3909090909090909  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.608522727272727 in round 3.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.3909090909090909  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.608522727272727 in round 3.  
Round 3 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.608522727272727. Default loss for Node A is 3.0608522727272724

- Total Dollar Payment Vector for round 3 and Node A  
Total Dollar Payment Vector for round 3 and Node A updated with value 3.5476704545454547

\*\*\*Node B\*\*\*

- Total payments in for Node B  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5476704545454547  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.6450309917355372 in round 3.

- Liabilities for Node B  
Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0  
Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0  
Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[16.0, 1.6450309917355372]$

Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5476704545454547  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.6450309917355372 in round 3.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5476704545454547

Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.6450309917355372 in round 3.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5476704545454547

Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.6450309917355372 in round 3.  
Round 3 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6450309917355372. Default loss for Node B is 0.16450309917355366

- Total Dollar Payment Vector for round 3 and Node B

Total Dollar Payment Vector for round 3 and Node B updated with value 1.4805278925619836

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.5476704545454547

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is 1.3909090909090909

Total payments in to Node C is 3.685025826446281 in round 3.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0, 7.685025826446282]

- Total Dollar Payment Vector for round 3 and Node C

Total Dollar Payment Vector for round 3 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 3

Total payment by Node A (i.e. p\_1): 3.5476704545454547

Total payment by Node B (i.e. p\_2): 1.4805278925619836

Total payment by Node C (i.e. p\_3): 4.0

[3.5476704545454547, 1.4805278925619836, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 3

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is 1.3909090909090909

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.608522727272727 in round 3.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.5476704545454547

Equity Vector for round 3 and Node A

Equity Vector for round 3 and Node A updated with value 3.0608522727272724 i.e.  
total cash flow 6.608522727272727 minus total payments out (liabilities)  
3.5476704545454547.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5476704545454547

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6450309917355372 in round 3.

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4805278925619836

Equity Vector for round 3 and Node B

Equity Vector for round 3 and Node B updated with value 0.16450309917355366 i.e.  
total cash flow 1.6450309917355372 minus total payments out (liabilities)  
1.4805278925619836.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5476704545454547

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.3909090909090909

Total payments in to Node C is 3.685025826446281 in round 3.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 3 and Node C

Equity Vector for round 3 and Node C updated with value 3.6850258264462816 i.e.  
total cash flow 7.685025826446282 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 3

Equity for Node A: 3.0608522727272724

Equity for Node B: 0.16450309917355366

Equity for Node C: 3.6850258264462816

[3.0608522727272724, 0.16450309917355366, 3.6850258264462816]  
-----

ROUND 3 DEFAULTERS

Node A has defaulted in round 3

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 3) are not identical, algorithm will proceed for another round.

-----  
END OF ROUND 3  
-----

START OF ROUND 4  
-----

TOTAL OBLIGATION VECTOR - round 4

i.e. total nominal obligations for each node i.e. p\_bar\_i...

Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0

Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0

Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 4

i.e. min[nominal obligations, cashflow (payments in + exogenous cash flow)] for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4805278925619836

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6477309529958677 in round 4.

- Liabilities for Node A

Liability of Node A to Node B (i.e. P\_01) is 2.0

Liability of Node A to Node C (i.e. P\_02) is 9.0

Total nominal liabilities for Node A (i.e. p\_bar\_1) is 11.0

Payment out is min[payment out, total cash flow] i.e. min[11.0,  
6.647730952995868]

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is



1.4805278925619836

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6477309529958677 in round 4.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is

1.4805278925619836

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6477309529958677 in round 4.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is

1.4805278925619836

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6477309529958677 in round 4.

Round 4 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.647730952995868. Default loss for Node A is 3.0647730952995875

- Total Dollar Payment Vector for round 4 and Node A

Total Dollar Payment Vector for round 4 and Node A updated with value  
3.5829578576962806

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is

3.5476704545454547

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6450309917355372 in round 4.

- Liabilities for Node B

Liability of Node B to Node A (i.e. P\_10) is 7.0

Liability of Node B to Node C (i.e. P\_12) is 9.0

Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
1.6450309917355372]

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is

3.5476704545454547

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6450309917355372 in round 4.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is

3.5476704545454547

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6450309917355372 in round 4.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is

3.5476704545454547

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6450309917355372 in round 4.

Round 4 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6450309917355372. Default loss for Node B is

0.16450309917355366

- Total Dollar Payment Vector for round 4 and Node B

Total Dollar Payment Vector for round 4 and Node B updated with value

1.4805278925619836

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is

3.5476704545454547

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is

1.4805278925619836

Total payments in to Node C is 3.7354364023760334 in round 4.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0, 7.735436402376033]

- Total Dollar Payment Vector for round 4 and Node C

Total Dollar Payment Vector for round 4 and Node C updated with value 4.0

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TOTAL PAYMENT VECTOR - round 4

Total payment by Node A (i.e. p\_1): 3.5829578576962806

Total payment by Node B (i.e. p\_2): 1.4805278925619836

Total payment by Node C (i.e. p\_3): 4.0

[3.5829578576962806, 1.4805278925619836, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 4

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4805278925619836  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6477309529958677 in round 4.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806  
Equity Vector for round 4 and Node A  
Equity Vector for round 4 and Node A updated with value 3.0647730952995875 i.e.  
total cash flow 6.647730952995868 minus total payments out (liabilities)  
3.5829578576962806.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5476704545454547  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6450309917355372 in round 4.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4805278925619836  
Equity Vector for round 4 and Node B  
Equity Vector for round 4 and Node B updated with value 0.16450309917355366 i.e.  
total cash flow 1.6450309917355372 minus total payments out (liabilities)  
1.4805278925619836.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5476704545454547  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4805278925619836  
Total payments in to Node C is 3.7354364023760334 in round 4.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 4 and Node C  
Equity Vector for round 4 and Node C updated with value 3.735436402376033 i.e.  
total cash flow 7.735436402376033 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 4

Equity for Node A: 3.0647730952995875  
Equity for Node B: 0.16450309917355366  
Equity for Node C: 3.735436402376033  
[3.0647730952995875, 0.16450309917355366, 3.735436402376033]

-----

ROUND 4 DEFAULTERS

Node A has defaulted in round 4  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 4) are  
not identical, algorithm will proceed for another round.

-----

END OF ROUND 4

-----

START OF ROUND 5

-----

TOTAL OBLIGATION VECTOR - round 5

i.e. total nominal obligations for each node i.e. p\_bar\_i...  
Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0  
Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0

-----

TOTAL PAYMENT MADE PER NODE - round 5

i.e. min[nominal obligations, cashflow (payments in + exogenous cash flow)] for  
each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4805278925619836  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6477309529958677 in round 5.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.647730952995868]$

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4805278925619836  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6477309529958677 in round 5.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4805278925619836  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6477309529958677 in round 5.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4805278925619836  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6477309529958677 in round 5.  
Round 5 and Node A has defaulted due to nominal obligations 11.0 being greater  
than cash flow 6.647730952995868. Default loss for Node A is 3.0647730952995875

- Total Dollar Payment Vector for round 5 and Node A

Total Dollar Payment Vector for round 5 and Node A updated with value  
3.5829578576962806

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.5829578576962806  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.6514468832175055 in round 5.

- Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0

Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[16.0, 1.6514468832175055]$

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5829578576962806

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6514468832175055 in round 5.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5829578576962806

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6514468832175055 in round 5.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5829578576962806

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6514468832175055 in round 5.

Round 5 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6514468832175055. Default loss for Node B is 0.16514468832175044

- Total Dollar Payment Vector for round 5 and Node B

Total Dollar Payment Vector for round 5 and Node B updated with value 1.486302194895755

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5829578576962806

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4805278925619836

Total payments in to Node C is 3.764307914044891 in round 5.

- Liabilities for Node C

Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0

Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0

Total nominal liabilities for Node C (i.e.  $p_{\text{bar}_3}$ ) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.764307914044891]

- Total Dollar Payment Vector for round 5 and Node C  
Total Dollar Payment Vector for round 5 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 5

Total payment by Node A (i.e. p\_1): 3.5829578576962806  
Total payment by Node B (i.e. p\_2): 1.486302194895755  
Total payment by Node C (i.e. p\_3): 4.0  
[3.5829578576962806, 1.486302194895755, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 5

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4805278925619836  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6477309529958677 in round 5.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806  
Equity Vector for round 5 and Node A  
Equity Vector for round 5 and Node A updated with value 3.0647730952995875 i.e.  
total cash flow 6.647730952995868 minus total payments out (liabilities)  
3.5829578576962806.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6514468832175055 in round 5.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486302194895755  
Equity Vector for round 5 and Node B  
Equity Vector for round 5 and Node B updated with value 0.16514468832175044 i.e.  
total cash flow 1.6514468832175055 minus total payments out (liabilities)

1.486302194895755.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4805278925619836

Total payments in to Node C is 3.764307914044891 in round 5.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 5 and Node C

Equity Vector for round 5 and Node C updated with value 3.764307914044891 i.e.  
total cash flow 7.764307914044891 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 5

Equity for Node A: 3.0647730952995875

Equity for Node B: 0.16514468832175044

Equity for Node C: 3.764307914044891

[3.0647730952995875, 0.16514468832175044, 3.764307914044891]

-----  
ROUND 5 DEFAULTERS

Node A has defaulted in round 5

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 5) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 5

-----  
START OF ROUND 6

-----  
TOTAL OBLIGATION VECTOR - round 6

i.e. total nominal obligations for each node i.e. p\_bar\_i...



Total nominal obligation for Node A (i.e.  $p_{\bar{1}}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\bar{2}}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\bar{3}}$ ): 4.0

-----

TOTAL PAYMENT MADE PER NODE - round 6

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.486302194895755

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6502572102668926 in round 6.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{\bar{1}}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650257210266893]$

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.486302194895755

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6502572102668926 in round 6.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.486302194895755

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6502572102668926 in round 6.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.486302194895755

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6502572102668926 in round 6.

Round 6 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650257210266893. Default loss for Node A is 3.0650257210266894

- Total Dollar Payment Vector for round 6 and Node A  
Total Dollar Payment Vector for round 6 and Node A updated with value  
3.5852314892402033

\*\*\*Node B\*\*\*

- Total payments in for Node B  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6514468832175055 in round 6.

- Liabilities for Node B  
Liability of Node B to Node A (i.e. P\_10) is 7.0  
Liability of Node B to Node C (i.e. P\_12) is 9.0  
Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
1.6514468832175055]  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6514468832175055 in round 6.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6514468832175055 in round 6.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6514468832175055 in round 6.  
Round 6 and Node B has defaulted due to nominal obligations 16.0 being greater  
than cash flow 1.6514468832175055. Default loss for Node B is  
0.16514468832175044

- Total Dollar Payment Vector for round 6 and Node B  
Total Dollar Payment Vector for round 6 and Node B updated with value  
1.486302194895755

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5829578576962806

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486302194895755

Total payments in to Node C is 3.7675559591076375 in round 6.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.7675559591076375]

- Total Dollar Payment Vector for round 6 and Node C

Total Dollar Payment Vector for round 6 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 6

Total payment by Node A (i.e. p\_1): 3.5852314892402033

Total payment by Node B (i.e. p\_2): 1.486302194895755

Total payment by Node C (i.e. p\_3): 4.0

[3.5852314892402033, 1.486302194895755, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 6

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486302194895755

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6502572102668926 in round 6.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5852314892402033

Equity Vector for round 6 and Node A

Equity Vector for round 6 and Node A updated with value 3.0650257210266894 i.e.  
total cash flow 6.650257210266893 minus total payments out (liabilities)

3.5852314892402033.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is

3.5829578576962806

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6514468832175055 in round 6.

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is

1.486302194895755

Equity Vector for round 6 and Node B

Equity Vector for round 6 and Node B updated with value 0.16514468832175044 i.e.  
total cash flow 1.6514468832175055 minus total payments out (liabilities)

1.486302194895755.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is

3.5829578576962806

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is

1.486302194895755

Total payments in to Node C is 3.7675559591076375 in round 6.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 6 and Node C

Equity Vector for round 6 and Node C updated with value 3.7675559591076375 i.e.  
total cash flow 7.7675559591076375 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 6

Equity for Node A: 3.0650257210266894

Equity for Node B: 0.16514468832175044

Equity for Node C: 3.7675559591076375

[3.0650257210266894, 0.16514468832175044, 3.7675559591076375]

-----  
ROUND 6 DEFAULTERS

Node A has defaulted in round 6

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 6) are

not identical, algorithm will proceed for another round.

-----  
END OF ROUND 6  
-----

START OF ROUND 7  
-----

TOTAL OBLIGATION VECTOR - round 7

i.e. total nominal obligations for each node i.e.  $p_{\bar{i}}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\bar{1}}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\bar{2}}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\bar{3}}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 7

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486302194895755  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6502572102668926 in round 7.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\bar{1}}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650257210266893]$   
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486302194895755  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.6502572102668926 in round 7.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.486302194895755  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6502572102668926 in round 7.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.486302194895755  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6502572102668926 in round 7.  
 Round 7 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650257210266893. Default loss for Node A is 3.0650257210266894

- Total Dollar Payment Vector for round 7 and Node A  
 Total Dollar Payment Vector for round 7 and Node A updated with value  
 3.5852314892402033

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5852314892402033  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518602707709462 in round 7.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e. P\_10) is 7.0  
 Liability of Node B to Node C (i.e. P\_12) is 9.0  
 Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
 1.6518602707709462]  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5852314892402033  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518602707709462 in round 7.  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5852314892402033  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6518602707709462 in round 7.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5852314892402033  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518602707709462 in round 7.  
 Round 7 and Node B has defaulted due to nominal obligations 16.0 being greater  
 than cash flow 1.6518602707709462. Default loss for Node B is  
 0.16518602707709462

- Total Dollar Payment Vector for round 7 and Node B  
 Total Dollar Payment Vector for round 7 and Node B updated with value  
 1.4866742436938516

\*\*\*Node C\*\*\*

- Total payments in for Node C  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5852314892402033  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.486302194895755  
 Total payments in to Node C is 3.7694162030981198 in round 7.

- Liabilities for Node C  
 Liability of Node C to Node A (i.e. P\_20) is 3.0  
 Liability of Node C to Node B (i.e. P\_21) is 1.0  
 Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
 7.769416203098119]

- Total Dollar Payment Vector for round 7 and Node C  
 Total Dollar Payment Vector for round 7 and Node C updated with value 4.0

-----

TOTAL PAYMENT VECTOR - round 7

Total payment by Node A (i.e. p\_1): 3.5852314892402033  
 Total payment by Node B (i.e. p\_2): 1.4866742436938516  
 Total payment by Node C (i.e. p\_3): 4.0  
 [3.5852314892402033, 1.4866742436938516, 4.0]

-----

UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 7

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486302194895755

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6502572102668926 in round 7.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5852314892402033

Equity Vector for round 7 and Node A

Equity Vector for round 7 and Node A updated with value 3.0650257210266894 i.e.  
total cash flow 6.650257210266893 minus total payments out (liabilities)  
3.5852314892402033.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5852314892402033

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6518602707709462 in round 7.

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866742436938516

Equity Vector for round 7 and Node B

Equity Vector for round 7 and Node B updated with value 0.16518602707709462 i.e.  
total cash flow 1.6518602707709462 minus total payments out (liabilities)  
1.4866742436938516.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5852314892402033

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486302194895755

Total payments in to Node C is 3.7694162030981198 in round 7.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 7 and Node C

Equity Vector for round 7 and Node C updated with value 3.7694162030981193 i.e.  
total cash flow 7.769416203098119 minus total payments out (liabilities) 4.0.

-----



EQUITY FOR EACH NODE - round 7

Equity for Node A: 3.0650257210266894

Equity for Node B: 0.16518602707709462

Equity for Node C: 3.7694162030981193

[3.0650257210266894, 0.16518602707709462, 3.7694162030981193]

-----  
ROUND 7 DEFAULTERS

Node A has defaulted in round 7

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 7) are not identical, algorithm will proceed for another round.

-----  
END OF ROUND 7

-----  
START OF ROUND 8

-----  
TOTAL OBLIGATION VECTOR - round 8

i.e. total nominal obligations for each node i.e.  $p_{bar_i}$

Total nominal obligation for Node A (i.e.  $p_{bar_1}$ ): 11.0

Total nominal obligation for Node B (i.e.  $p_{bar_2}$ ): 16.0

Total nominal obligation for Node C (i.e.  $p_{bar_3}$ ): 4.0

-----  
TOTAL PAYMENT MADE PER NODE - round 8

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.65041998161606 in round 8.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[11.0, 6.65041998161606]$

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.65041998161606 in round 8.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.65041998161606 in round 8.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.65041998161606 in round 8.

Round 8 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.65041998161606. Default loss for Node A is 3.0650419981616057

- Total Dollar Payment Vector for round 8 and Node A

Total Dollar Payment Vector for round 8 and Node A updated with value 3.585377983454454

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5852314892402033

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518602707709462 in round 8.

- Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0

Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

Total nominal liabilities for Node B (i.e.  $p_{\bar{2}}$ ) is 16.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[16.0, 1.6518602707709462]$

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5852314892402033

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518602707709462 in round 8.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5852314892402033

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518602707709462 in round 8.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5852314892402033

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518602707709462 in round 8.

Round 8 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6518602707709462. Default loss for Node B is 0.16518602707709462

- Total Dollar Payment Vector for round 8 and Node B

Total Dollar Payment Vector for round 8 and Node B updated with value 1.4866742436938516

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5852314892402033

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Total payments in to Node C is 3.769625480547049 in round 8.

- Liabilities for Node C

Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0

Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0

Total nominal liabilities for Node C (i.e.  $p_{\bar{3}}$ ) is 4.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[4.0, 7.769625480547049]$

- Total Dollar Payment Vector for round 8 and Node C  
Total Dollar Payment Vector for round 8 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 8

Total payment by Node A (i.e. p\_1): 3.585377983454454  
Total payment by Node B (i.e. p\_2): 1.4866742436938516  
Total payment by Node C (i.e. p\_3): 4.0  
[3.585377983454454, 1.4866742436938516, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 8

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866742436938516  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.65041998161606 in round 8.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585377983454454  
Equity Vector for round 8 and Node A  
Equity Vector for round 8 and Node A updated with value 3.0650419981616057 i.e.  
total cash flow 6.65041998161606 minus total payments out (liabilities)  
3.585377983454454.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5852314892402033  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518602707709462 in round 8.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866742436938516  
Equity Vector for round 8 and Node B  
Equity Vector for round 8 and Node B updated with value 0.16518602707709462 i.e.  
total cash flow 1.6518602707709462 minus total payments out (liabilities)  
1.4866742436938516.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5852314892402033  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866742436938516  
Total payments in to Node C is 3.769625480547049 in round 8.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 8 and Node C  
Equity Vector for round 8 and Node C updated with value 3.769625480547049 i.e.  
total cash flow 7.769625480547049 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 8

Equity for Node A: 3.0650419981616057  
Equity for Node B: 0.16518602707709462  
Equity for Node C: 3.769625480547049  
[3.0650419981616057, 0.16518602707709462, 3.769625480547049]

-----  
ROUND 8 DEFAULTERS

Node A has defaulted in round 8  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 8) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 8

-----  
START OF ROUND 9

-----  
TOTAL OBLIGATION VECTOR - round 9

i.e. total nominal obligations for each node i.e. p\_bar\_i...  
Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0  
Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0

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TOTAL PAYMENT MADE PER NODE - round 9

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.65041998161606 in round 9.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.65041998161606]$

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.65041998161606 in round 9.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.65041998161606 in round 9.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.65041998161606 in round 9.

Round 9 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.65041998161606. Default loss for Node A is 3.0650419981616057

- Total Dollar Payment Vector for round 9 and Node A

Total Dollar Payment Vector for round 9 and Node A updated with value

3.585377983454454

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.585377983454454

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.651886906082628 in round 9.

- Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0

Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[16.0,$   
1.651886906082628]

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.585377983454454

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.651886906082628 in round 9.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.585377983454454

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.651886906082628 in round 9.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.585377983454454

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.651886906082628 in round 9.

Round 9 and Node B has defaulted due to nominal obligations 16.0 being greater  
than cash flow 1.651886906082628. Default loss for Node B is 0.1651886906082627

- Total Dollar Payment Vector for round 9 and Node B

Total Dollar Payment Vector for round 9 and Node B updated with value  
1.4866982154743653

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585377983454454

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866742436938516

Total payments in to Node C is 3.769745339449618 in round 9.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769745339449618]

- Total Dollar Payment Vector for round 9 and Node C

Total Dollar Payment Vector for round 9 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 9

Total payment by Node A (i.e. p\_1): 3.585377983454454

Total payment by Node B (i.e. p\_2): 1.4866982154743653

Total payment by Node C (i.e. p\_3): 4.0

[3.585377983454454, 1.4866982154743653, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 9

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866742436938516

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.65041998161606 in round 9.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585377983454454

Equity Vector for round 9 and Node A

Equity Vector for round 9 and Node A updated with value 3.0650419981616057 i.e.  
total cash flow 6.65041998161606 minus total payments out (liabilities)  
3.585377983454454.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.



Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585377983454454  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651886906082628 in round 9.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866982154743653  
Equity Vector for round 9 and Node B  
Equity Vector for round 9 and Node B updated with value 0.1651886906082627 i.e.  
total cash flow 1.651886906082628 minus total payments out (liabilities)  
1.4866982154743653.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585377983454454  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866742436938516  
Total payments in to Node C is 3.769745339449618 in round 9.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 9 and Node C  
Equity Vector for round 9 and Node C updated with value 3.769745339449618 i.e.  
total cash flow 7.769745339449618 minus total payments out (liabilities) 4.0.

-----

EQUITY FOR EACH NODE - round 9

Equity for Node A: 3.0650419981616057  
Equity for Node B: 0.1651886906082627  
Equity for Node C: 3.769745339449618  
[3.0650419981616057, 0.1651886906082627, 3.769745339449618]

-----

ROUND 9 DEFAULTERS

Node A has defaulted in round 9  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 9) are  
not identical, algorithm will proceed for another round.

-----

END OF ROUND 9

-----  
START OF ROUND 10  
-----

TOTAL OBLIGATION VECTOR - round 10

i.e. total nominal obligations for each node i.e.  $p_{\bar{i}}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\bar{1}}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\bar{2}}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\bar{3}}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 10

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866982154743653  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650430469270035 in round 10.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\bar{1}}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.6504304692700345]$

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866982154743653  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650430469270035 in round 10.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866982154743653

Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.650430469270035 in round 10.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866982154743653  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.650430469270035 in round 10.  
 Round 10 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.6504304692700345. Default loss for Node A is 3.065043046927003

- Total Dollar Payment Vector for round 10 and Node A  
 Total Dollar Payment Vector for round 10 and Node A updated with value  
 3.5853874223430315

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585377983454454  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651886906082628 in round 10.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e. P\_10) is 7.0  
 Liability of Node B to Node C (i.e. P\_12) is 9.0  
 Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
 1.651886906082628]  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585377983454454  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651886906082628 in round 10.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585377983454454  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651886906082628 in round 10.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585377983454454

Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651886906082628 in round 10.  
 Round 10 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.651886906082628. Default loss for Node B is 0.1651886906082627

- Total Dollar Payment Vector for round 10 and Node B  
 Total Dollar Payment Vector for round 10 and Node B updated with value 1.4866982154743653

\*\*\*Node C\*\*\*

- Total payments in for Node C  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.585377983454454  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is 1.4866982154743653  
 Total payments in to Node C is 3.769758823576157 in round 10.

- Liabilities for Node C  
 Liability of Node C to Node A (i.e. P\_20) is 3.0  
 Liability of Node C to Node B (i.e. P\_21) is 1.0  
 Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0, 7.769758823576157]

- Total Dollar Payment Vector for round 10 and Node C  
 Total Dollar Payment Vector for round 10 and Node C updated with value 4.0

-----  
 TOTAL PAYMENT VECTOR - round 10

Total payment by Node A (i.e. p\_1): 3.5853874223430315  
 Total payment by Node B (i.e. p\_2): 1.4866982154743653  
 Total payment by Node C (i.e. p\_3): 4.0  
 [3.5853874223430315, 1.4866982154743653, 4.0]

-----  
 UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 10

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
 Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866982154743653  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.650430469270035 in round 10.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Equity Vector for round 10 and Node A  
Equity Vector for round 10 and Node A updated with value 3.065043046927003 i.e.  
total cash flow 6.6504304692700345 minus total payments out (liabilities)  
3.5853874223430315.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585377983454454  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651886906082628 in round 10.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866982154743653  
Equity Vector for round 10 and Node B  
Equity Vector for round 10 and Node B updated with value 0.1651886906082627 i.e.  
total cash flow 1.651886906082628 minus total payments out (liabilities)  
1.4866982154743653.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585377983454454  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866982154743653  
Total payments in to Node C is 3.769758823576157 in round 10.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 10 and Node C  
Equity Vector for round 10 and Node C updated with value 3.769758823576157 i.e.  
total cash flow 7.769758823576157 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 10

Equity for Node A: 3.065043046927003  
Equity for Node B: 0.1651886906082627

Equity for Node C: 3.769758823576157  
[3.065043046927003, 0.1651886906082627, 3.769758823576157]

-----

ROUND 10 DEFAULTERS

Node A has defaulted in round 10  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 10) are  
not identical, algorithm will proceed for another round.

-----

END OF ROUND 10

-----

START OF ROUND 11

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TOTAL OBLIGATION VECTOR - round 11

i.e. total nominal obligations for each node i.e.  $p_{\text{bar}_i}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\text{bar}_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\text{bar}_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\text{bar}_3}$ ): 4.0

-----

TOTAL PAYMENT MADE PER NODE - round 11

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for  
each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866982154743653  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650430469270035 in round 11.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
 Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0  
  
 Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.6504304692700345]$   
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866982154743653  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node A is 3.650430469270035 in round 11.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866982154743653  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node A is 3.650430469270035 in round 11.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866982154743653  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node A is 3.650430469270035 in round 11.  
 Round 11 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.6504304692700345. Default loss for Node A is 3.065043046927003

- Total Dollar Payment Vector for round 11 and Node A  
 Total Dollar Payment Vector for round 11 and Node A updated with value 3.5853874223430315

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853874223430315  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node B is 1.6518886222441875 in round 11.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0  
 Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0  
 Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[16.0, 1.6518886222441875]$   
 Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 11.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 11.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 11.  
Round 11 and Node B has defaulted due to nominal obligations 16.0 being greater  
than cash flow 1.6518886222441875. Default loss for Node B is  
0.16518886222441864

- Total Dollar Payment Vector for round 11 and Node B  
Total Dollar Payment Vector for round 11 and Node B updated with value  
1.486699760019769

\*\*\*Node C\*\*\*

- Total payments in for Node C  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866982154743653  
Total payments in to Node C is 3.769766546303175 in round 11.

- Liabilities for Node C  
Liability of Node C to Node A (i.e. P\_20) is 3.0  
Liability of Node C to Node B (i.e. P\_21) is 1.0  
Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769766546303175]

- Total Dollar Payment Vector for round 11 and Node C  
Total Dollar Payment Vector for round 11 and Node C updated with value 4.0

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TOTAL PAYMENT VECTOR - round 11

Total payment by Node A (i.e. p\_1): 3.5853874223430315  
Total payment by Node B (i.e. p\_2): 1.486699760019769  
Total payment by Node C (i.e. p\_3): 4.0  
[3.5853874223430315, 1.486699760019769, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 11

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866982154743653  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.650430469270035 in round 11.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Equity Vector for round 11 and Node A  
Equity Vector for round 11 and Node A updated with value 3.065043046927003 i.e.  
total cash flow 6.6504304692700345 minus total payments out (liabilities)  
3.5853874223430315.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 11.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699760019769  
Equity Vector for round 11 and Node B  
Equity Vector for round 11 and Node B updated with value 0.16518886222441864  
i.e. total cash flow 1.6518886222441875 minus total payments out (liabilities)  
1.486699760019769.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866982154743653  
Total payments in to Node C is 3.769766546303175 in round 11.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 11 and Node C  
Equity Vector for round 11 and Node C updated with value 3.769766546303175 i.e.  
total cash flow 7.769766546303175 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 11

Equity for Node A: 3.065043046927003  
Equity for Node B: 0.16518886222441864  
Equity for Node C: 3.769766546303175  
[3.065043046927003, 0.16518886222441864, 3.769766546303175]

-----  
ROUND 11 DEFAULTERS

Node A has defaulted in round 11  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 11) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 11

-----  
START OF ROUND 12

-----  
TOTAL OBLIGATION VECTOR - round 12

i.e. total nominal obligations for each node i.e. p\_bar\_i...  
Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0  
Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0

-----  
TOTAL PAYMENT MADE PER NODE - round 12

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699760019769

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431145008649 in round 12.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431145008649]$

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699760019769

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431145008649 in round 12.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699760019769

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431145008649 in round 12.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699760019769

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431145008649 in round 12.

Round 12 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650431145008649. Default loss for Node A is 3.065043114500865

- Total Dollar Payment Vector for round 12 and Node A

Total Dollar Payment Vector for round 12 and Node A updated with value 3.585388030507784

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 12.

- Liabilities for Node B

Liability of Node B to Node A (i.e. P\_10) is 7.0  
Liability of Node B to Node C (i.e. P\_12) is 9.0  
Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
1.6518886222441875]

Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 12.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315

Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 12.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315

Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 12.

Round 12 and Node B has defaulted due to nominal obligations 16.0 being greater  
than cash flow 1.6518886222441875. Default loss for Node B is  
0.16518886222441864

- Total Dollar Payment Vector for round 12 and Node B

Total Dollar Payment Vector for round 12 and Node B updated with value  
1.486699760019769

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is

1.486699760019769

Total payments in to Node C is 3.769767415109964 in round 12.

- Liabilities for Node C

Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0

Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0

Total nominal liabilities for Node C (i.e.  $p_{\text{bar}_3}$ ) is 4.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[4.0, 7.769767415109964]$

- Total Dollar Payment Vector for round 12 and Node C

Total Dollar Payment Vector for round 12 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 12

Total payment by Node A (i.e.  $p_1$ ): 3.585388030507784

Total payment by Node B (i.e.  $p_2$ ): 1.486699760019769

Total payment by Node C (i.e.  $p_3$ ): 4.0

[3.585388030507784, 1.486699760019769, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 12

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.486699760019769

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431145008649 in round 12.

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.585388030507784

Equity Vector for round 12 and Node A

Equity Vector for round 12 and Node A updated with value 3.065043114500865 i.e.  
total cash flow 6.650431145008649 minus total payments out (liabilities)  
3.585388030507784.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.5853874223430315

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518886222441875 in round 12.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699760019769  
Equity Vector for round 12 and Node B  
Equity Vector for round 12 and Node B updated with value 0.16518886222441864  
i.e. total cash flow 1.6518886222441875 minus total payments out (liabilities)  
1.486699760019769.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853874223430315  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699760019769  
Total payments in to Node C is 3.769767415109964 in round 12.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 12 and Node C  
Equity Vector for round 12 and Node C updated with value 3.769767415109964 i.e.  
total cash flow 7.769767415109964 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 12

Equity for Node A: 3.065043114500865  
Equity for Node B: 0.16518886222441864  
Equity for Node C: 3.769767415109964  
[3.065043114500865, 0.16518886222441864, 3.769767415109964]

-----  
ROUND 12 DEFAULTERS

Node A has defaulted in round 12  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 12) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 12  
-----

START OF ROUND 13

-----  
TOTAL OBLIGATION VECTOR - round 13

i.e. total nominal obligations for each node i.e.  $p_{\bar{i}}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\bar{1}}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\bar{2}}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\bar{3}}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 13

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699760019769  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650431145008649 in round 13.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\bar{1}}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431145008649]$   
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699760019769  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650431145008649 in round 13.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699760019769  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650431145008649 in round 13.  
Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699760019769  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.650431145008649 in round 13.  
Round 13 and Node A has defaulted due to nominal obligations 11.0 being greater  
than cash flow 6.650431145008649. Default loss for Node A is 3.065043114500865

- Total Dollar Payment Vector for round 13 and Node A  
Total Dollar Payment Vector for round 13 and Node A updated with value  
3.585388030507784

\*\*\*Node B\*\*\*

- Total payments in for Node B  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388030507784  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888732819597 in round 13.

- Liabilities for Node B  
Liability of Node B to Node A (i.e. P\_10) is 7.0  
Liability of Node B to Node C (i.e. P\_12) is 9.0  
Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
1.651888732819597]  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388030507784  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888732819597 in round 13.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388030507784  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888732819597 in round 13.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388030507784  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888732819597 in round 13.  
Round 13 and Node B has defaulted due to nominal obligations 16.0 being greater



than cash flow 1.651888732819597. Default loss for Node B is 0.16518887328195975

- Total Dollar Payment Vector for round 13 and Node B  
Total Dollar Payment Vector for round 13 and Node B updated with value  
1.4866998595376373

\*\*\*Node C\*\*\*

- Total payments in for Node C  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388030507784  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699760019769  
Total payments in to Node C is 3.769767912699307 in round 13.

- Liabilities for Node C  
Liability of Node C to Node A (i.e. P\_20) is 3.0  
Liability of Node C to Node B (i.e. P\_21) is 1.0  
Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769767912699307]

- Total Dollar Payment Vector for round 13 and Node C  
Total Dollar Payment Vector for round 13 and Node C updated with value 4.0

-----

TOTAL PAYMENT VECTOR - round 13

Total payment by Node A (i.e. p\_1): 3.585388030507784  
Total payment by Node B (i.e. p\_2): 1.4866998595376373  
Total payment by Node C (i.e. p\_3): 4.0  
[3.585388030507784, 1.4866998595376373, 4.0]

-----

UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 13

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699760019769  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.650431145008649 in round 13.  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Equity Vector for round 13 and Node A  
 Equity Vector for round 13 and Node A updated with value 3.065043114500865 i.e.  
 total cash flow 6.650431145008649 minus total payments out (liabilities)  
 3.585388030507784.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888732819597 in round 13.  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Equity Vector for round 13 and Node B  
 Equity Vector for round 13 and Node B updated with value 0.16518887328195975  
 i.e. total cash flow 1.651888732819597 minus total payments out (liabilities)  
 1.4866998595376373.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.486699760019769  
 Total payments in to Node C is 3.769767912699307 in round 13.  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Equity Vector for round 13 and Node C  
 Equity Vector for round 13 and Node C updated with value 3.769767912699307 i.e.  
 total cash flow 7.769767912699307 minus total payments out (liabilities) 4.0.

-----  
 EQUITY FOR EACH NODE - round 13

Equity for Node A: 3.065043114500865  
 Equity for Node B: 0.16518887328195975  
 Equity for Node C: 3.769767912699307  
 [3.065043114500865, 0.16518887328195975, 3.769767912699307]  
 -----

## ROUND 13 DEFAULTERS

Node A has defaulted in round 13

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 13) are not identical, algorithm will proceed for another round.

-----  
END OF ROUND 13

-----  
START OF ROUND 14

-----  
TOTAL OBLIGATION VECTOR - round 14

i.e. total nominal obligations for each node i.e.  $p_{bar_i}$

Total nominal obligation for Node A (i.e.  $p_{bar_1}$ ): 11.0

Total nominal obligation for Node B (i.e.  $p_{bar_2}$ ): 16.0

Total nominal obligation for Node C (i.e.  $p_{bar_3}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 14

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866998595376373

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.6504311885477163 in round 14.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{bar_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0,$

6.650431188547716]  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311885477163 in round 14.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311885477163 in round 14.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311885477163 in round 14.  
 Round 14 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650431188547716. Default loss for Node A is 3.0650431188547715

- Total Dollar Payment Vector for round 14 and Node A  
 Total Dollar Payment Vector for round 14 and Node A updated with value  
 3.5853880696929448

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888732819597 in round 14.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e. P\_10) is 7.0  
 Liability of Node B to Node C (i.e. P\_12) is 9.0  
 Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
 1.651888732819597]  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.651888732819597 in round 14.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888732819597 in round 14.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888732819597 in round 14.  
 Round 14 and Node B has defaulted due to nominal obligations 16.0 being greater  
 than cash flow 1.651888732819597. Default loss for Node B is 0.16518887328195975

- Total Dollar Payment Vector for round 14 and Node B  
 Total Dollar Payment Vector for round 14 and Node B updated with value  
 1.4866998595376373

\*\*\*Node C\*\*\*

- Total payments in for Node C  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388030507784  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Total payments in to Node C is 3.769767968678108 in round 14.

- Liabilities for Node C  
 Liability of Node C to Node A (i.e. P\_20) is 3.0  
 Liability of Node C to Node B (i.e. P\_21) is 1.0  
 Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
 7.769767968678108]

- Total Dollar Payment Vector for round 14 and Node C  
 Total Dollar Payment Vector for round 14 and Node C updated with value 4.0

-----  
 TOTAL PAYMENT VECTOR - round 14

Total payment by Node A (i.e. p\_1): 3.5853880696929448  
 Total payment by Node B (i.e. p\_2): 1.4866998595376373

Total payment by Node C (i.e. p\_3): 4.0  
[3.5853880696929448, 1.4866998595376373, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 14

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998595376373  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311885477163 in round 14.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448  
Equity Vector for round 14 and Node A  
Equity Vector for round 14 and Node A updated with value 3.0650431188547715 i.e.  
total cash flow 6.650431188547716 minus total payments out (liabilities)  
3.5853880696929448.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388030507784  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888732819597 in round 14.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998595376373  
Equity Vector for round 14 and Node B  
Equity Vector for round 14 and Node B updated with value 0.16518887328195975  
i.e. total cash flow 1.651888732819597 minus total payments out (liabilities)  
1.4866998595376373.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388030507784  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998595376373  
Total payments in to Node C is 3.769767968678108 in round 14.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 14 and Node C

Equity Vector for round 14 and Node C updated with value 3.7697679686781083 i.e.  
total cash flow 7.769767968678108 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 14

Equity for Node A: 3.0650431188547715  
Equity for Node B: 0.16518887328195975  
Equity for Node C: 3.7697679686781083  
[3.0650431188547715, 0.16518887328195975, 3.7697679686781083]

-----  
ROUND 14 DEFAULTERS

Node A has defaulted in round 14  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 14) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 14

-----  
START OF ROUND 15

-----  
TOTAL OBLIGATION VECTOR - round 15

i.e. total nominal obligations for each node i.e. p\_bar\_i...  
Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0  
Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0

-----  
TOTAL PAYMENT MADE PER NODE - round 15

i.e. min[nominal obligations, cashflow (payments in + exogenous cash flow)] for  
each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311885477163 in round 15.

- Liabilities for Node A  
 Liability of Node A to Node B (i.e. P\_01) is 2.0  
 Liability of Node A to Node C (i.e. P\_02) is 9.0  
 Total nominal liabilities for Node A (i.e. p\_bar\_1) is 11.0

Payment out is min[payment out, total cash flow] i.e. min[11.0,  
 6.650431188547716]

Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311885477163 in round 15.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311885477163 in round 15.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998595376373  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311885477163 in round 15.  
 Round 15 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650431188547716. Default loss for Node A is 3.0650431188547715

- Total Dollar Payment Vector for round 15 and Node A  
 Total Dollar Payment Vector for round 15 and Node A updated with value  
 3.5853880696929448

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880696929448  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0



Total payments in to Node B is 1.6518887399441717 in round 15.

- Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0

Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[16.0, 1.6518887399441717]$

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880696929448

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887399441717 in round 15.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880696929448

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887399441717 in round 15.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880696929448

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887399441717 in round 15.

Round 15 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6518887399441717. Default loss for Node B is 0.16518887399441717

- Total Dollar Payment Vector for round 15 and Node B

Total Dollar Payment Vector for round 15 and Node B updated with value 1.4866998659497546

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880696929448

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998595376373

Total payments in to Node C is 3.769768000738694 in round 15.

- Liabilities for Node C

Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0

Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0  
Total nominal liabilities for Node C (i.e.  $p_{\bar{3}}$ ) is 4.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[4.0, 7.769768000738694]$

- Total Dollar Payment Vector for round 15 and Node C  
Total Dollar Payment Vector for round 15 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 15

Total payment by Node A (i.e.  $p_1$ ): 3.5853880696929448  
Total payment by Node B (i.e.  $p_2$ ): 1.4866998659497546  
Total payment by Node C (i.e.  $p_3$ ): 4.0  
[3.5853880696929448, 1.4866998659497546, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 15

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998595376373  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311885477163 in round 15.  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880696929448  
Equity Vector for round 15 and Node A  
Equity Vector for round 15 and Node A updated with value 3.0650431188547715 i.e. total cash flow 6.650431188547716 minus total payments out (liabilities) 3.5853880696929448.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880696929448  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.6518887399441717 in round 15.  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998659497546  
Equity Vector for round 15 and Node B

Equity Vector for round 15 and Node B updated with value 0.16518887399441717  
i.e. total cash flow 1.6518887399441717 minus total payments out (liabilities)  
1.4866998659497546.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998595376373

Total payments in to Node C is 3.769768000738694 in round 15.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 15 and Node C

Equity Vector for round 15 and Node C updated with value 3.7697680007386936 i.e.  
total cash flow 7.769768000738694 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 15

Equity for Node A: 3.0650431188547715

Equity for Node B: 0.16518887399441717

Equity for Node C: 3.7697680007386936

[3.0650431188547715, 0.16518887399441717, 3.7697680007386936]

-----  
ROUND 15 DEFAULTERS

Node A has defaulted in round 15

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 15) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 15

-----  
START OF ROUND 16

-----  
TOTAL OBLIGATION VECTOR - round 16

i.e. total nominal obligations for each node i.e.  $p_{\text{bar}_i}$   
Total nominal obligation for Node A (i.e.  $p_{\text{bar}_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\text{bar}_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\text{bar}_3}$ ): 4.0

-----  
TOTAL PAYMENT MADE PER NODE - round 16

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998659497546  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311913530176 in round 16.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191353018]$   
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998659497546  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311913530176 in round 16.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998659497546  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311913530176 in round 16.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998659497546  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311913530176 in round 16.

Round 16 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650431191353018. Default loss for Node A is 3.065043119135302

- Total Dollar Payment Vector for round 16 and Node A  
Total Dollar Payment Vector for round 16 and Node A updated with value  
3.5853880722177163

\*\*\*Node B\*\*\*

- Total payments in for Node B  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887399441717 in round 16.

- Liabilities for Node B  
Liability of Node B to Node A (i.e. P\_10) is 7.0  
Liability of Node B to Node C (i.e. P\_12) is 9.0  
Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
1.6518887399441717]

Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887399441717 in round 16.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887399441717 in round 16.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887399441717 in round 16.  
Round 16 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6518887399441717. Default loss for Node B is  
0.16518887399441717

- Total Dollar Payment Vector for round 16 and Node B  
Total Dollar Payment Vector for round 16 and Node B updated with value

1.4866998659497546

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998659497546

Total payments in to Node C is 3.7697680043455097 in round 16.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0, 7.76976800434551]

- Total Dollar Payment Vector for round 16 and Node C

Total Dollar Payment Vector for round 16 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 16

Total payment by Node A (i.e. p\_1): 3.5853880722177163

Total payment by Node B (i.e. p\_2): 1.4866998659497546

Total payment by Node C (i.e. p\_3): 4.0

[3.5853880722177163, 1.4866998659497546, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 16

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998659497546

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311913530176 in round 16.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163

Equity Vector for round 16 and Node A

Equity Vector for round 16 and Node A updated with value 3.065043119135302 i.e.

total cash flow 6.650431191353018 minus total payments out (liabilities)  
3.5853880722177163.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887399441717 in round 16.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998659497546  
Equity Vector for round 16 and Node B  
Equity Vector for round 16 and Node B updated with value 0.16518887399441717  
i.e. total cash flow 1.6518887399441717 minus total payments out (liabilities)  
1.4866998659497546.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880696929448  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998659497546  
Total payments in to Node C is 3.7697680043455097 in round 16.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 16 and Node C  
Equity Vector for round 16 and Node C updated with value 3.7697680043455097 i.e.  
total cash flow 7.76976800434551 minus total payments out (liabilities) 4.0.

-----

EQUITY FOR EACH NODE - round 16

Equity for Node A: 3.065043119135302  
Equity for Node B: 0.16518887399441717  
Equity for Node C: 3.7697680043455097  
[3.065043119135302, 0.16518887399441717, 3.7697680043455097]

-----

ROUND 16 DEFAULTERS

Node A has defaulted in round 16  
{ 'A': True, 'B': True, 'C': False }

The payment vectors for the previous round and current round (i.e. round 16) are not identical, algorithm will proceed for another round.

-----  
END OF ROUND 16  
-----

START OF ROUND 17  
-----

TOTAL OBLIGATION VECTOR - round 17

i.e. total nominal obligations for each node i.e.  $p_{\text{bar}_i}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\text{bar}_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\text{bar}_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\text{bar}_3}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 17

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998659497546  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311913530176 in round 17.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191353018]$   
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998659497546  
Relative Payment in to Node A from Node C is 0.75



Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311913530176 in round 17.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998659497546  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311913530176 in round 17.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998659497546  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311913530176 in round 17.  
 Round 17 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650431191353018. Default loss for Node A is 3.065043119135302

- Total Dollar Payment Vector for round 17 and Node A  
 Total Dollar Payment Vector for round 17 and Node A updated with value  
 3.5853880722177163

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880722177163  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404032212 in round 17.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e. P\_10) is 7.0  
 Liability of Node B to Node C (i.e. P\_12) is 9.0  
 Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
 1.6518887404032212]  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880722177163  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404032212 in round 17.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880722177163  
 Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404032212 in round 17.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404032212 in round 17.  
Round 17 and Node B has defaulted due to nominal obligations 16.0 being greater  
than cash flow 1.6518887404032212. Default loss for Node B is 0.165188874040322

- Total Dollar Payment Vector for round 17 and Node B  
Total Dollar Payment Vector for round 17 and Node B updated with value  
1.4866998663628992

\*\*\*Node C\*\*\*

- Total payments in for Node C  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998659497546  
Total payments in to Node C is 3.7697680064112324 in round 17.

- Liabilities for Node C  
Liability of Node C to Node A (i.e. P\_20) is 3.0  
Liability of Node C to Node B (i.e. P\_21) is 1.0  
Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769768006411232]

- Total Dollar Payment Vector for round 17 and Node C  
Total Dollar Payment Vector for round 17 and Node C updated with value 4.0

-----

TOTAL PAYMENT VECTOR - round 17

Total payment by Node A (i.e. p\_1): 3.5853880722177163  
Total payment by Node B (i.e. p\_2): 1.4866998663628992  
Total payment by Node C (i.e. p\_3): 4.0  
[3.5853880722177163, 1.4866998663628992, 4.0]

-----

UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 17

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998659497546

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311913530176 in round 17.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163

Equity Vector for round 17 and Node A

Equity Vector for round 17 and Node A updated with value 3.065043119135302 i.e.  
total cash flow 6.650431191353018 minus total payments out (liabilities)  
3.5853880722177163.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6518887404032212 in round 17.

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992

Equity Vector for round 17 and Node B

Equity Vector for round 17 and Node B updated with value 0.165188874040322 i.e.  
total cash flow 1.6518887404032212 minus total payments out (liabilities)  
1.4866998663628992.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998659497546

Total payments in to Node C is 3.7697680064112324 in round 17.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 17 and Node C

Equity Vector for round 17 and Node C updated with value 3.7697680064112324 i.e.  
total cash flow 7.769768006411232 minus total payments out (liabilities) 4.0.

-----

EQUITY FOR EACH NODE - round 17

Equity for Node A: 3.065043119135302

Equity for Node B: 0.165188874040322

Equity for Node C: 3.7697680064112324

[3.065043119135302, 0.165188874040322, 3.7697680064112324]

-----

ROUND 17 DEFAULTERS

Node A has defaulted in round 17

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 17) are not identical, algorithm will proceed for another round.

-----

END OF ROUND 17

-----

START OF ROUND 18

-----

TOTAL OBLIGATION VECTOR - round 18

i.e. total nominal obligations for each node i.e.  $p_{bar_i}$

Total nominal obligation for Node A (i.e.  $p_{bar_1}$ ): 11.0

Total nominal obligation for Node B (i.e.  $p_{bar_2}$ ): 16.0

Total nominal obligation for Node C (i.e.  $p_{bar_3}$ ): 4.0

-----

TOTAL PAYMENT MADE PER NODE - round 18

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915337686 in round 18.

- Liabilities for Node A

Liability of Node A to Node B (i.e. P\_01) is 2.0

Liability of Node A to Node C (i.e. P\_02) is 9.0

Total nominal liabilities for Node A (i.e. p\_bar\_1) is 11.0

Payment out is min[payment out, total cash flow] i.e. min[11.0,  
6.650431191533769]

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 18.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 18.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 18.

Round 18 and Node A has defaulted due to nominal obligations 11.0 being greater  
than cash flow 6.650431191533769. Default loss for Node A is 3.065043119153377

- Total Dollar Payment Vector for round 18 and Node A

Total Dollar Payment Vector for round 18 and Node A updated with value  
3.5853880723803915

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6518887404032212 in round 18.

- Liabilities for Node B

Liability of Node B to Node A (i.e. P\_10) is 7.0

Liability of Node B to Node C (i.e. P\_12) is 9.0

Total nominal liabilities for Node B (i.e.  $p_{\bar{2}}$ ) is 16.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[16.0, 1.6518887404032212]$

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880722177163

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887404032212 in round 18.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880722177163

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887404032212 in round 18.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880722177163

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887404032212 in round 18.

Round 18 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6518887404032212. Default loss for Node B is 0.165188874040322

- Total Dollar Payment Vector for round 18 and Node B

Total Dollar Payment Vector for round 18 and Node B updated with value 1.4866998663628992

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880722177163

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663628992

Total payments in to Node C is 3.769768006643626 in round 18.

- Liabilities for Node C

Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0

Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0

Total nominal liabilities for Node C (i.e.  $p_{\bar{3}}$ ) is 4.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[4.0, 7.769768006643626]$

- Total Dollar Payment Vector for round 18 and Node C  
Total Dollar Payment Vector for round 18 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 18

Total payment by Node A (i.e. p\_1): 3.5853880723803915  
Total payment by Node B (i.e. p\_2): 1.4866998663628992  
Total payment by Node C (i.e. p\_3): 4.0  
[3.5853880723803915, 1.4866998663628992, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 18

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915337686 in round 18.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723803915  
Equity Vector for round 18 and Node A  
Equity Vector for round 18 and Node A updated with value 3.065043119153377 i.e.  
total cash flow 6.650431191533769 minus total payments out (liabilities)  
3.5853880723803915.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404032212 in round 18.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992  
Equity Vector for round 18 and Node B  
Equity Vector for round 18 and Node B updated with value 0.165188874040322 i.e.  
total cash flow 1.6518887404032212 minus total payments out (liabilities)  
1.4866998663628992.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880722177163  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992  
Total payments in to Node C is 3.769768006643626 in round 18.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 18 and Node C  
Equity Vector for round 18 and Node C updated with value 3.769768006643626 i.e.  
total cash flow 7.769768006643626 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 18

Equity for Node A: 3.065043119153377  
Equity for Node B: 0.165188874040322  
Equity for Node C: 3.769768006643626  
[3.065043119153377, 0.165188874040322, 3.769768006643626]

-----  
ROUND 18 DEFAULTERS

Node A has defaulted in round 18  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 18) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 18

-----  
START OF ROUND 19

-----  
TOTAL OBLIGATION VECTOR - round 19

i.e. total nominal obligations for each node i.e. p\_bar\_i...  
Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0  
Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0



-----  
TOTAL PAYMENT MADE PER NODE - round 19

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 19.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191533769]$

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 19.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 19.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 19.

Round 19 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650431191533769. Default loss for Node A is 3.065043119153377

- Total Dollar Payment Vector for round 19 and Node A

Total Dollar Payment Vector for round 19 and Node A updated with value 3.5853880723803915

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.5853880723803915

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887404327984 in round 19.

- Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0

Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[16.0, 1.6518887404327984]$

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.5853880723803915

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887404327984 in round 19.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.5853880723803915

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887404327984 in round 19.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is  
3.5853880723803915

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.6518887404327984 in round 19.

Round 19 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6518887404327984. Default loss for Node B is

0.16518887404327987

- Total Dollar Payment Vector for round 19 and Node B

Total Dollar Payment Vector for round 19 and Node B updated with value  
1.4866998663895186

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723803915

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992

Total payments in to Node C is 3.769768006776724 in round 19.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769768006776724]

- Total Dollar Payment Vector for round 19 and Node C

Total Dollar Payment Vector for round 19 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 19

Total payment by Node A (i.e. p\_1): 3.5853880723803915

Total payment by Node B (i.e. p\_2): 1.4866998663895186

Total payment by Node C (i.e. p\_3): 4.0

[3.5853880723803915, 1.4866998663895186, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 19

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915337686 in round 19.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723803915

Equity Vector for round 19 and Node A

Equity Vector for round 19 and Node A updated with value 3.065043119153377 i.e.  
total cash flow 6.650431191533769 minus total payments out (liabilities)  
3.5853880723803915.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723803915  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404327984 in round 19.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663895186  
Equity Vector for round 19 and Node B  
Equity Vector for round 19 and Node B updated with value 0.16518887404327987  
i.e. total cash flow 1.6518887404327984 minus total payments out (liabilities)  
1.4866998663895186.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723803915  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663628992  
Total payments in to Node C is 3.769768006776724 in round 19.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 19 and Node C  
Equity Vector for round 19 and Node C updated with value 3.769768006776724 i.e.  
total cash flow 7.769768006776724 minus total payments out (liabilities) 4.0.

-----

EQUITY FOR EACH NODE - round 19

Equity for Node A: 3.065043119153377  
Equity for Node B: 0.16518887404327987  
Equity for Node C: 3.769768006776724  
[3.065043119153377, 0.16518887404327987, 3.769768006776724]

-----

ROUND 19 DEFAULTERS

Node A has defaulted in round 19  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 19) are  
not identical, algorithm will proceed for another round.

-----

END OF ROUND 19

-----  
START OF ROUND 20  
-----

TOTAL OBLIGATION VECTOR - round 20

i.e. total nominal obligations for each node i.e.  $p_{bar_i}$ ...  
Total nominal obligation for Node A (i.e.  $p_{bar_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{bar_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{bar_3}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 20

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663895186  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915454144 in round 20.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{bar_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191545414]$

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663895186  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915454144 in round 20.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663895186

Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915454144 in round 20.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663895186  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915454144 in round 20.  
 Round 20 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650431191545414. Default loss for Node A is 3.0650431191545415

- Total Dollar Payment Vector for round 20 and Node A  
 Total Dollar Payment Vector for round 20 and Node A updated with value  
 3.585388072390873

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723803915  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404327984 in round 20.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e. P\_10) is 7.0  
 Liability of Node B to Node C (i.e. P\_12) is 9.0  
 Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
 1.6518887404327984]  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723803915  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404327984 in round 20.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723803915  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404327984 in round 20.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723803915

Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404327984 in round 20.  
Round 20 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6518887404327984. Default loss for Node B is 0.16518887404327987

- Total Dollar Payment Vector for round 20 and Node B  
Total Dollar Payment Vector for round 20 and Node B updated with value 1.4866998663895186

\*\*\*Node C\*\*\*

- Total payments in for Node C  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.5853880723803915  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is 1.4866998663895186  
Total payments in to Node C is 3.7697680067916974 in round 20.

- Liabilities for Node C  
Liability of Node C to Node A (i.e. P\_20) is 3.0  
Liability of Node C to Node B (i.e. P\_21) is 1.0  
Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0, 7.769768006791697]

- Total Dollar Payment Vector for round 20 and Node C  
Total Dollar Payment Vector for round 20 and Node C updated with value 4.0

-----

TOTAL PAYMENT VECTOR - round 20

Total payment by Node A (i.e. p\_1): 3.585388072390873  
Total payment by Node B (i.e. p\_2): 1.4866998663895186  
Total payment by Node C (i.e. p\_3): 4.0  
[3.585388072390873, 1.4866998663895186, 4.0]

-----

UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 20

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663895186  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915454144 in round 20.  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388072390873  
 Equity Vector for round 20 and Node A  
 Equity Vector for round 20 and Node A updated with value 3.0650431191545415 i.e.  
 total cash flow 6.650431191545414 minus total payments out (liabilities)  
 3.585388072390873.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723803915  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404327984 in round 20.  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663895186  
 Equity Vector for round 20 and Node B  
 Equity Vector for round 20 and Node B updated with value 0.16518887404327987  
 i.e. total cash flow 1.6518887404327984 minus total payments out (liabilities)  
 1.4866998663895186.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723803915  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663895186  
 Total payments in to Node C is 3.7697680067916974 in round 20.  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Equity Vector for round 20 and Node C  
 Equity Vector for round 20 and Node C updated with value 3.769768006791697 i.e.  
 total cash flow 7.769768006791697 minus total payments out (liabilities) 4.0.

-----

EQUITY FOR EACH NODE - round 20

Equity for Node A: 3.0650431191545415



Equity for Node B: 0.16518887404327987  
Equity for Node C: 3.769768006791697  
[3.0650431191545415, 0.16518887404327987, 3.769768006791697]

-----

## ROUND 20 DEFAULTERS

Node A has defaulted in round 20  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 20) are not identical, algorithm will proceed for another round.

-----

## END OF ROUND 20

-----

## START OF ROUND 21

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## TOTAL OBLIGATION VECTOR - round 21

i.e. total nominal obligations for each node i.e.  $p_{bar_i}$ ...  
Total nominal obligation for Node A (i.e.  $p_{bar_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{bar_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{bar_3}$ ): 4.0

-----

## TOTAL PAYMENT MADE PER NODE - round 21

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

### \*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663895186  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915454144 in round 21.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[11.0, 6.650431191545414]$

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663895186

Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915454144 in round 21.

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663895186

Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915454144 in round 21.

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663895186

Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915454144 in round 21.

Round 21 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650431191545414. Default loss for Node A is 3.0650431191545415

- Total Dollar Payment Vector for round 21 and Node A  
Total Dollar Payment Vector for round 21 and Node A updated with value 3.585388072390873

\*\*\*Node B\*\*\*

- Total payments in for Node B  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 21.

- Liabilities for Node B  
Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0  
Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0  
Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[16.0, 1.6518887404347042]$

Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p<sub>1</sub>) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p<sub>3</sub>) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 21.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p<sub>1</sub>) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p<sub>3</sub>) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 21.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p<sub>1</sub>) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p<sub>3</sub>) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 21.  
Round 21 and Node B has defaulted due to nominal obligations 16.0 being greater  
than cash flow 1.6518887404347042. Default loss for Node B is  
0.16518887404347038

- Total Dollar Payment Vector for round 21 and Node B  
Total Dollar Payment Vector for round 21 and Node B updated with value  
1.4866998663912339

\*\*\*Node C\*\*\*

- Total payments in for Node C  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p<sub>1</sub>) is  
3.585388072390873  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p<sub>2</sub>) is  
1.4866998663895186  
Total payments in to Node C is 3.7697680068002732 in round 21.

- Liabilities for Node C  
Liability of Node C to Node A (i.e. P<sub>20</sub>) is 3.0  
Liability of Node C to Node B (i.e. P<sub>21</sub>) is 1.0  
Total nominal liabilities for Node C (i.e. p<sub>bar\_3</sub>) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769768006800273]

- Total Dollar Payment Vector for round 21 and Node C  
Total Dollar Payment Vector for round 21 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 21

Total payment by Node A (i.e. p\_1): 3.585388072390873  
Total payment by Node B (i.e. p\_2): 1.4866998663912339  
Total payment by Node C (i.e. p\_3): 4.0  
[3.585388072390873, 1.4866998663912339, 4.0]  
-----

UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 21

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663895186  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915454144 in round 21.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Equity Vector for round 21 and Node A  
Equity Vector for round 21 and Node A updated with value 3.0650431191545415 i.e.  
total cash flow 6.650431191545414 minus total payments out (liabilities)  
3.585388072390873.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 21.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663912339  
Equity Vector for round 21 and Node B  
Equity Vector for round 21 and Node B updated with value 0.16518887404347038  
i.e. total cash flow 1.6518887404347042 minus total payments out (liabilities)  
1.4866998663912339.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873

Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663895186  
Total payments in to Node C is 3.7697680068002732 in round 21.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 21 and Node C  
Equity Vector for round 21 and Node C updated with value 3.7697680068002732 i.e.  
total cash flow 7.769768006800273 minus total payments out (liabilities) 4.0.

---

#### EQUITY FOR EACH NODE - round 21

Equity for Node A: 3.0650431191545415  
Equity for Node B: 0.16518887404347038  
Equity for Node C: 3.7697680068002732  
[3.0650431191545415, 0.16518887404347038, 3.7697680068002732]

---

#### ROUND 21 DEFAULTERS

Node A has defaulted in round 21  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 21) are  
not identical, algorithm will proceed for another round.

---

END OF ROUND 21

---

START OF ROUND 22

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#### TOTAL OBLIGATION VECTOR - round 22

i.e. total nominal obligations for each node i.e. p\_bar\_i...  
Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0  
Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0

---

TOTAL PAYMENT MADE PER NODE - round 22

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866998663912339

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431191546165 in round 22.

- Liabilities for Node A

Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0

Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0

Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191546165]$

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866998663912339

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431191546165 in round 22.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866998663912339

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431191546165 in round 22.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is  
1.4866998663912339

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node A is 3.650431191546165 in round 22.

Round 22 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650431191546165. Default loss for Node A is 3.065043119154616

- Total Dollar Payment Vector for round 22 and Node A

Total Dollar Payment Vector for round 22 and Node A updated with value  
3.5853880723915488

\*\*\*Node B\*\*\*

- Total payments in for Node B  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 22.

- Liabilities for Node B  
Liability of Node B to Node A (i.e. P\_10) is 7.0  
Liability of Node B to Node C (i.e. P\_12) is 9.0  
Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
1.6518887404347042]  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 22.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 22.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 22.  
Round 22 and Node B has defaulted due to nominal obligations 16.0 being greater  
than cash flow 1.6518887404347042. Default loss for Node B is  
0.16518887404347038

- Total Dollar Payment Vector for round 22 and Node B  
Total Dollar Payment Vector for round 22 and Node B updated with value  
1.4866998663912339

\*\*\*Node C\*\*\*

- Total payments in for Node C  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663912339

Total payments in to Node C is 3.7697680068012382 in round 22.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769768006801238]

- Total Dollar Payment Vector for round 22 and Node C

Total Dollar Payment Vector for round 22 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 22

Total payment by Node A (i.e. p\_1): 3.5853880723915488

Total payment by Node B (i.e. p\_2): 1.4866998663912339

Total payment by Node C (i.e. p\_3): 4.0

[3.5853880723915488, 1.4866998663912339, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 22

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663912339

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.650431191546165 in round 22.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915488

Equity Vector for round 22 and Node A

Equity Vector for round 22 and Node A updated with value 3.065043119154616 i.e.  
total cash flow 6.650431191546165 minus total payments out (liabilities)  
3.5853880723915488.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873



Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404347042 in round 22.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663912339  
Equity Vector for round 22 and Node B  
Equity Vector for round 22 and Node B updated with value 0.16518887404347038  
i.e. total cash flow 1.6518887404347042 minus total payments out (liabilities)  
1.4866998663912339.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072390873  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663912339  
Total payments in to Node C is 3.7697680068012382 in round 22.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 22 and Node C  
Equity Vector for round 22 and Node C updated with value 3.769768006801238 i.e.  
total cash flow 7.769768006801238 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 22

Equity for Node A: 3.065043119154616  
Equity for Node B: 0.16518887404347038  
Equity for Node C: 3.769768006801238  
[3.065043119154616, 0.16518887404347038, 3.769768006801238]

-----  
ROUND 22 DEFAULTERS

Node A has defaulted in round 22  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 22) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 22  
-----

START OF ROUND 23

-----  
TOTAL OBLIGATION VECTOR - round 23

i.e. total nominal obligations for each node i.e.  $p_{\bar{i}}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\bar{1}}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\bar{2}}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\bar{3}}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 23

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663912339  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650431191546165 in round 23.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\bar{1}}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191546165]$   
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663912339  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650431191546165 in round 23.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663912339  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.650431191546165 in round 23.

Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663912339  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.650431191546165 in round 23.  
 Round 23 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650431191546165. Default loss for Node A is 3.065043119154616

- Total Dollar Payment Vector for round 23 and Node A  
 Total Dollar Payment Vector for round 23 and Node A updated with value  
 3.5853880723915488

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 23.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e. P\_10) is 7.0  
 Liability of Node B to Node C (i.e. P\_12) is 9.0  
 Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
 1.651888740434827]  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 23.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 23.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 23.

Round 23 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.651888740434827. Default loss for Node B is 0.1651888740434826

- Total Dollar Payment Vector for round 23 and Node B  
Total Dollar Payment Vector for round 23 and Node B updated with value 1.4866998663913444

\*\*\*Node C\*\*\*

- Total payments in for Node C  
Relative Payment in to Node C from Node A is 0.81818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is 3.5853880723915488  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is 1.4866998663912339  
Total payments in to Node C is 3.769768006801791 in round 23.

- Liabilities for Node C  
Liability of Node C to Node A (i.e. P\_20) is 3.0  
Liability of Node C to Node B (i.e. P\_21) is 1.0  
Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0, 7.769768006801791]

- Total Dollar Payment Vector for round 23 and Node C  
Total Dollar Payment Vector for round 23 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 23

Total payment by Node A (i.e. p\_1): 3.5853880723915488  
Total payment by Node B (i.e. p\_2): 1.4866998663913444  
Total payment by Node C (i.e. p\_3): 4.0  
[3.5853880723915488, 1.4866998663913444, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 23

\*\*\*Node A\*\*\*  
Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is 1.4866998663912339  
Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.650431191546165 in round 23.  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Equity Vector for round 23 and Node A  
 Equity Vector for round 23 and Node A updated with value 3.065043119154616 i.e.  
 total cash flow 6.650431191546165 minus total payments out (liabilities)  
 3.5853880723915488.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 23.  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913444  
 Equity Vector for round 23 and Node B  
 Equity Vector for round 23 and Node B updated with value 0.1651888740434826 i.e.  
 total cash flow 1.651888740434827 minus total payments out (liabilities)  
 1.4866998663913444.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663912339  
 Total payments in to Node C is 3.769768006801791 in round 23.  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Equity Vector for round 23 and Node C  
 Equity Vector for round 23 and Node C updated with value 3.769768006801791 i.e.  
 total cash flow 7.769768006801791 minus total payments out (liabilities) 4.0.

-----  
 EQUITY FOR EACH NODE - round 23

Equity for Node A: 3.065043119154616  
 Equity for Node B: 0.1651888740434826  
 Equity for Node C: 3.769768006801791  
 [3.065043119154616, 0.1651888740434826, 3.769768006801791]

-----  
ROUND 23 DEFAULTERS

Node A has defaulted in round 23

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 23) are not identical, algorithm will proceed for another round.

-----  
END OF ROUND 23

-----  
START OF ROUND 24

-----  
TOTAL OBLIGATION VECTOR - round 24

i.e. total nominal obligations for each node i.e. p\_bar\_i...

Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0

Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0

Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0

-----  
TOTAL PAYMENT MADE PER NODE - round 24

i.e. min[nominal obligations, cashflow (payments in + exogenous cash flow)] for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913444

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915462133 in round 24.

- Liabilities for Node A

Liability of Node A to Node B (i.e. P\_01) is 2.0

Liability of Node A to Node C (i.e. P\_02) is 9.0

Total nominal liabilities for Node A (i.e. p\_bar\_1) is 11.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[11.0, 6.650431191546213]$   
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913444  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node A is 3.6504311915462133 in round 24.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913444  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node A is 3.6504311915462133 in round 24.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913444  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node A is 3.6504311915462133 in round 24.  
 Round 24 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650431191546213. Default loss for Node A is 3.0650431191546206

- Total Dollar Payment Vector for round 24 and Node A  
 Total Dollar Payment Vector for round 24 and Node A updated with value 3.5853880723915923

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 24.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0  
 Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0  
 Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[16.0, 1.651888740434827]$   
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 24.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 24.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.651888740434827 in round 24.  
 Round 24 and Node B has defaulted due to nominal obligations 16.0 being greater  
 than cash flow 1.651888740434827. Default loss for Node B is 0.1651888740434826

- Total Dollar Payment Vector for round 24 and Node B  
 Total Dollar Payment Vector for round 24 and Node B updated with value  
 1.4866998663913444

\*\*\*Node C\*\*\*

- Total payments in for Node C  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915488  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913444  
 Total payments in to Node C is 3.7697680068018533 in round 24.

- Liabilities for Node C  
 Liability of Node C to Node A (i.e. P\_20) is 3.0  
 Liability of Node C to Node B (i.e. P\_21) is 1.0  
 Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
 7.769768006801853]

- Total Dollar Payment Vector for round 24 and Node C  
 Total Dollar Payment Vector for round 24 and Node C updated with value 4.0

-----

TOTAL PAYMENT VECTOR - round 24

Total payment by Node A (i.e. p\_1): 3.5853880723915923



Total payment by Node B (i.e. p\_2): 1.4866998663913444  
Total payment by Node C (i.e. p\_3): 4.0  
[3.5853880723915923, 1.4866998663913444, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 24

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913444  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915462133 in round 24.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923  
Equity Vector for round 24 and Node A  
Equity Vector for round 24 and Node A updated with value 3.0650431191546206 i.e.  
total cash flow 6.650431191546213 minus total payments out (liabilities)  
3.5853880723915923.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915488  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888740434827 in round 24.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913444  
Equity Vector for round 24 and Node B  
Equity Vector for round 24 and Node B updated with value 0.1651888740434826 i.e.  
total cash flow 1.651888740434827 minus total payments out (liabilities)  
1.4866998663913444.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915488  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913444  
Total payments in to Node C is 3.7697680068018533 in round 24.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 24 and Node C  
Equity Vector for round 24 and Node C updated with value 3.7697680068018533 i.e.  
total cash flow 7.769768006801853 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 24

Equity for Node A: 3.0650431191546206  
Equity for Node B: 0.1651888740434826  
Equity for Node C: 3.7697680068018533  
[3.0650431191546206, 0.1651888740434826, 3.7697680068018533]

-----  
ROUND 24 DEFAULTERS

Node A has defaulted in round 24  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 24) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 24

-----  
START OF ROUND 25

-----  
TOTAL OBLIGATION VECTOR - round 25

i.e. total nominal obligations for each node i.e.  $p_{bar_i}$   
Total nominal obligation for Node A (i.e.  $p_{bar_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{bar_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{bar_3}$ ): 4.0

-----  
TOTAL PAYMENT MADE PER NODE - round 25

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for  
each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913444  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915462133 in round 25.

- Liabilities for Node A  
 Liability of Node A to Node B (i.e. P\_01) is 2.0  
 Liability of Node A to Node C (i.e. P\_02) is 9.0  
 Total nominal liabilities for Node A (i.e. p\_bar\_1) is 11.0

Payment out is min[payment out, total cash flow] i.e. min[11.0,  
 6.650431191546213]

Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913444  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915462133 in round 25.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913444  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915462133 in round 25.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913444  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915462133 in round 25.  
 Round 25 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650431191546213. Default loss for Node A is 3.0650431191546206

- Total Dollar Payment Vector for round 25 and Node A  
 Total Dollar Payment Vector for round 25 and Node A updated with value  
 3.5853880723915923

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.5853880723915923  
 Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.651888740434835 in round 25.

- Liabilities for Node B

Liability of Node B to Node A (i.e.  $P_{10}$ ) is 7.0

Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0

Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[16.0, 1.651888740434835]$

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915923

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.651888740434835 in round 25.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915923

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.651888740434835 in round 25.

Relative Payment in to Node B from Node A is 0.18181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915923

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Total payments in to Node B is 1.651888740434835 in round 25.

Round 25 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.651888740434835. Default loss for Node B is 0.16518887404348348

- Total Dollar Payment Vector for round 25 and Node B

Total Dollar Payment Vector for round 25 and Node B updated with value 1.4866998663913515

\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915923

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913444

Total payments in to Node C is 3.769768006801889 in round 25.

- Liabilities for Node C

Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0

Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0  
Total nominal liabilities for Node C (i.e.  $p_{\bar{3}}$ ) is 4.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[4.0, 7.769768006801889]$

- Total Dollar Payment Vector for round 25 and Node C  
Total Dollar Payment Vector for round 25 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 25

Total payment by Node A (i.e.  $p_1$ ): 3.5853880723915923  
Total payment by Node B (i.e.  $p_2$ ): 1.4866998663913515  
Total payment by Node C (i.e.  $p_3$ ): 4.0  
[3.5853880723915923, 1.4866998663913515, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 25

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913444  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915462133 in round 25.  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915923  
Equity Vector for round 25 and Node A  
Equity Vector for round 25 and Node A updated with value 3.0650431191546206 i.e. total cash flow 6.650431191546213 minus total payments out (liabilities) 3.5853880723915923.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.5853880723915923  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node B is 1.651888740434835 in round 25.  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913515  
Equity Vector for round 25 and Node B

Equity Vector for round 25 and Node B updated with value 0.16518887404348348  
i.e. total cash flow 1.651888740434835 minus total payments out (liabilities)  
1.4866998663913515.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913444

Total payments in to Node C is 3.769768006801889 in round 25.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 25 and Node C

Equity Vector for round 25 and Node C updated with value 3.769768006801889 i.e.  
total cash flow 7.769768006801889 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 25

Equity for Node A: 3.0650431191546206

Equity for Node B: 0.16518887404348348

Equity for Node C: 3.769768006801889

[3.0650431191546206, 0.16518887404348348, 3.769768006801889]

-----  
ROUND 25 DEFAULTERS

Node A has defaulted in round 25

{'A': True, 'B': True, 'C': False}

The payment vectors for the previous round and current round (i.e. round 25) are  
not identical, algorithm will proceed for another round.

-----  
END OF ROUND 25

-----  
START OF ROUND 26

-----  
TOTAL OBLIGATION VECTOR - round 26

i.e. total nominal obligations for each node i.e.  $p_{\bar{i}}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\bar{1}}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\bar{2}}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\bar{3}}$ ): 4.0

-----  
TOTAL PAYMENT MADE PER NODE - round 26

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913515  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 26.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\bar{1}}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191546216]$   
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913515  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 26.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913515  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 26.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913515  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 26.

Round 26 and Node A has defaulted due to nominal obligations 11.0 being greater than cash flow 6.650431191546216. Default loss for Node A is 3.0650431191546215

- Total Dollar Payment Vector for round 26 and Node A  
Total Dollar Payment Vector for round 26 and Node A updated with value  
3.5853880723915923

\*\*\*Node B\*\*\*

- Total payments in for Node B  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888740434835 in round 26.

- Liabilities for Node B  
Liability of Node B to Node A (i.e. P\_10) is 7.0  
Liability of Node B to Node C (i.e. P\_12) is 9.0  
Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
1.651888740434835]

Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888740434835 in round 26.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888740434835 in round 26.  
Relative Payment in to Node B from Node A is 0.18181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923

Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888740434835 in round 26.  
Round 26 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.651888740434835. Default loss for Node B is 0.16518887404348348

- Total Dollar Payment Vector for round 26 and Node B  
Total Dollar Payment Vector for round 26 and Node B updated with value  
1.4866998663913515



\*\*\*Node C\*\*\*

- Total payments in for Node C

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913515

Total payments in to Node C is 3.769768006801893 in round 26.

- Liabilities for Node C

Liability of Node C to Node A (i.e. P\_20) is 3.0

Liability of Node C to Node B (i.e. P\_21) is 1.0

Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
7.769768006801893]

- Total Dollar Payment Vector for round 26 and Node C

Total Dollar Payment Vector for round 26 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 26

Total payment by Node A (i.e. p\_1): 3.585388072391595

Total payment by Node B (i.e. p\_2): 1.4866998663913515

Total payment by Node C (i.e. p\_3): 4.0

[3.585388072391595, 1.4866998663913515, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 26

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913515

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915462164 in round 26.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595

Equity Vector for round 26 and Node A

Equity Vector for round 26 and Node A updated with value 3.0650431191546215 i.e.

total cash flow 6.650431191546216 minus total payments out (liabilities)  
3.5853880723915923.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.651888740434835 in round 26.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913515  
Equity Vector for round 26 and Node B  
Equity Vector for round 26 and Node B updated with value 0.16518887404348348  
i.e. total cash flow 1.651888740434835 minus total payments out (liabilities)  
1.4866998663913515.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.  
Relative Payment in to Node C from Node A is 0.8181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.5853880723915923  
Relative Payment in to Node C from Node B is 0.5625  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913515  
Total payments in to Node C is 3.769768006801893 in round 26.  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Equity Vector for round 26 and Node C  
Equity Vector for round 26 and Node C updated with value 3.7697680068018933 i.e.  
total cash flow 7.769768006801893 minus total payments out (liabilities) 4.0.

-----

EQUITY FOR EACH NODE - round 26

Equity for Node A: 3.0650431191546215  
Equity for Node B: 0.16518887404348348  
Equity for Node C: 3.7697680068018933  
[3.0650431191546215, 0.16518887404348348, 3.7697680068018933]

-----

ROUND 26 DEFAULTERS

Node A has defaulted in round 26  
{ 'A': True, 'B': True, 'C': False }

The payment vectors for the previous round and current round (i.e. round 26) are not identical, algorithm will proceed for another round.

-----  
END OF ROUND 26  
-----

START OF ROUND 27  
-----

TOTAL OBLIGATION VECTOR - round 27

i.e. total nominal obligations for each node i.e.  $p_{\text{bar}_i}$ ...  
Total nominal obligation for Node A (i.e.  $p_{\text{bar}_1}$ ): 11.0  
Total nominal obligation for Node B (i.e.  $p_{\text{bar}_2}$ ): 16.0  
Total nominal obligation for Node C (i.e.  $p_{\text{bar}_3}$ ): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 27

i.e.  $\min[\text{nominal obligations, cashflow (payments in + exogenous cash flow)}]$  for each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913515  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 27.

- Liabilities for Node A  
Liability of Node A to Node B (i.e.  $P_{01}$ ) is 2.0  
Liability of Node A to Node C (i.e.  $P_{02}$ ) is 9.0  
Total nominal liabilities for Node A (i.e.  $p_{\text{bar}_1}$ ) is 11.0

Payment out is  $\min[\text{payment out, total cash flow}]$  i.e.  $\min[11.0, 6.650431191546216]$   
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.4866998663913515  
Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915462164 in round 27.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913515  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915462164 in round 27.  
 Relative Payment in to Node A from Node B is 0.4375  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913515  
 Relative Payment in to Node A from Node C is 0.75  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node A is 3.6504311915462164 in round 27.  
 Round 27 and Node A has defaulted due to nominal obligations 11.0 being greater  
 than cash flow 6.650431191546216. Default loss for Node A is 3.0650431191546215

- Total Dollar Payment Vector for round 27 and Node A  
 Total Dollar Payment Vector for round 27 and Node A updated with value  
 3.585388072391595

\*\*\*Node B\*\*\*

- Total payments in for Node B  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388072391595  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404348355 in round 27.

- Liabilities for Node B  
 Liability of Node B to Node A (i.e. P\_10) is 7.0  
 Liability of Node B to Node C (i.e. P\_12) is 9.0  
 Total nominal liabilities for Node B (i.e. p\_bar\_2) is 16.0

Payment out is min[payment out, total cash flow] i.e. min[16.0,  
 1.6518887404348355]  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388072391595  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404348355 in round 27.  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388072391595  
 Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404348355 in round 27.  
 Relative Payment in to Node B from Node A is 0.181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388072391595  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
 Total payments in to Node B is 1.6518887404348355 in round 27.  
 Round 27 and Node B has defaulted due to nominal obligations 16.0 being greater  
 than cash flow 1.6518887404348355. Default loss for Node B is  
 0.16518887404348348

- Total Dollar Payment Vector for round 27 and Node B  
 Total Dollar Payment Vector for round 27 and Node B updated with value  
 1.486699866391352

\*\*\*Node C\*\*\*

- Total payments in for Node C  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
 3.585388072391595  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
 1.4866998663913515  
 Total payments in to Node C is 3.769768006801895 in round 27.

- Liabilities for Node C  
 Liability of Node C to Node A (i.e. P\_20) is 3.0  
 Liability of Node C to Node B (i.e. P\_21) is 1.0  
 Total nominal liabilities for Node C (i.e. p\_bar\_3) is 4.0

Payment out is min[payment out, total cash flow] i.e. min[4.0,  
 7.769768006801895]

- Total Dollar Payment Vector for round 27 and Node C  
 Total Dollar Payment Vector for round 27 and Node C updated with value 4.0

-----

TOTAL PAYMENT VECTOR - round 27

Total payment by Node A (i.e. p\_1): 3.585388072391595  
 Total payment by Node B (i.e. p\_2): 1.486699866391352  
 Total payment by Node C (i.e. p\_3): 4.0  
 [3.585388072391595, 1.486699866391352, 4.0]

-----

UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 27

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913515

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915462164 in round 27.

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595

Equity Vector for round 27 and Node A

Equity Vector for round 27 and Node A updated with value 3.0650431191546215 i.e.  
total cash flow 6.650431191546216 minus total payments out (liabilities)  
3.585388072391595.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.

Relative Payment in to Node B from Node A is 0.181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595

Relative Payment in to Node B from Node C is 0.25

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node B is 1.6518887404348355 in round 27.

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352

Equity Vector for round 27 and Node B

Equity Vector for round 27 and Node B updated with value 0.16518887404348348  
i.e. total cash flow 1.6518887404348355 minus total payments out (liabilities)  
1.486699866391352.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.4866998663913515

Total payments in to Node C is 3.769768006801895 in round 27.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 27 and Node C

Equity Vector for round 27 and Node C updated with value 3.769768006801895 i.e.  
total cash flow 7.769768006801895 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 27

Equity for Node A: 3.0650431191546215  
Equity for Node B: 0.16518887404348348  
Equity for Node C: 3.769768006801895  
[3.0650431191546215, 0.16518887404348348, 3.769768006801895]  
-----

ROUND 27 DEFAULTERS

Node A has defaulted in round 27  
{'A': True, 'B': True, 'C': False}  
The payment vectors for the previous round and current round (i.e. round 27) are  
not identical, algorithm will proceed for another round.  
-----

END OF ROUND 27  
-----

START OF ROUND 28  
-----

TOTAL OBLIGATION VECTOR - round 28

i.e. total nominal obligations for each node i.e. p\_bar\_i...  
Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0  
Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total nominal obligation for Node C (i.e. p\_bar\_3): 4.0  
-----

TOTAL PAYMENT MADE PER NODE - round 28

i.e. min[nominal obligations, cashflow (payments in + exogenous cash flow)] for  
each node...

\*\*\*Node A\*\*\*

- Total payments in for Node A  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352

Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 28.

- Liabilities for Node A

Liability of Node A to Node B (i.e. P\_01) is 2.0  
Liability of Node A to Node C (i.e. P\_02) is 9.0  
Total nominal liabilities for Node A (i.e. p\_bar\_1) is 11.0

Payment out is min[payment out, total cash flow] i.e. min[11.0,  
6.650431191546216]

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352

Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 28.

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352

Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 28.

Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352

Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 28.

Round 28 and Node A has defaulted due to nominal obligations 11.0 being greater  
than cash flow 6.650431191546216. Default loss for Node A is 3.0650431191546215

- Total Dollar Payment Vector for round 28 and Node A

Total Dollar Payment Vector for round 28 and Node A updated with value  
3.585388072391595

\*\*\*Node B\*\*\*

- Total payments in for Node B

Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595

Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404348355 in round 28.

- Liabilities for Node B

Liability of Node B to Node A (i.e. P\_10) is 7.0



Liability of Node B to Node C (i.e.  $P_{12}$ ) is 9.0  
 Total nominal liabilities for Node B (i.e.  $p_{\text{bar}_2}$ ) is 16.0  
  
 Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[16.0, 1.6518887404348355]$   
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.585388072391595  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node B is 1.6518887404348355 in round 28.  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.585388072391595  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node B is 1.6518887404348355 in round 28.  
 Relative Payment in to Node B from Node A is 0.18181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.585388072391595  
 Relative Payment in to Node B from Node C is 0.25  
 Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0  
 Total payments in to Node B is 1.6518887404348355 in round 28.  
 Round 28 and Node B has defaulted due to nominal obligations 16.0 being greater than cash flow 1.6518887404348355. Default loss for Node B is 0.16518887404348348

- Total Dollar Payment Vector for round 28 and Node B  
 Total Dollar Payment Vector for round 28 and Node B updated with value 1.486699866391352

\*\*\*Node C\*\*\*

- Total payments in for Node C  
 Relative Payment in to Node C from Node A is 0.8181818181818182  
 Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.585388072391595  
 Relative Payment in to Node C from Node B is 0.5625  
 Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699866391352  
 Total payments in to Node C is 3.769768006801895 in round 28.

- Liabilities for Node C  
 Liability of Node C to Node A (i.e.  $P_{20}$ ) is 3.0  
 Liability of Node C to Node B (i.e.  $P_{21}$ ) is 1.0  
 Total nominal liabilities for Node C (i.e.  $p_{\text{bar}_3}$ ) is 4.0

Payment out is  $\min[\text{payment out}, \text{total cash flow}]$  i.e.  $\min[4.0,$

7.769768006801895]

- Total Dollar Payment Vector for round 28 and Node C  
Total Dollar Payment Vector for round 28 and Node C updated with value 4.0

-----  
TOTAL PAYMENT VECTOR - round 28

Total payment by Node A (i.e. p\_1): 3.585388072391595  
Total payment by Node B (i.e. p\_2): 1.486699866391352  
Total payment by Node C (i.e. p\_3): 4.0  
[3.585388072391595, 1.486699866391352, 4.0]

-----  
UPDATE EQUITY (i.e. BOOK VALUE) FOR EACH NODE - round 28

\*\*\*Node A\*\*\*

Total operating cash flow (exogenous assets) 3.0.  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 28.  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595  
Equity Vector for round 28 and Node A  
Equity Vector for round 28 and Node A updated with value 3.0650431191546215 i.e.  
total cash flow 6.650431191546216 minus total payments out (liabilities)  
3.585388072391595.

\*\*\*Node B\*\*\*

Total operating cash flow (exogenous assets) 0.0.  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404348355 in round 28.  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352  
Equity Vector for round 28 and Node B  
Equity Vector for round 28 and Node B updated with value 0.16518887404348348  
i.e. total cash flow 1.6518887404348355 minus total payments out (liabilities)  
1.486699866391352.

\*\*\*Node C\*\*\*

Total operating cash flow (exogenous assets) 4.0.

Relative Payment in to Node C from Node A is 0.81818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352

Total payments in to Node C is 3.769768006801895 in round 28.

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Equity Vector for round 28 and Node C

Equity Vector for round 28 and Node C updated with value 3.769768006801895 i.e.  
total cash flow 7.769768006801895 minus total payments out (liabilities) 4.0.

-----  
EQUITY FOR EACH NODE - round 28

Equity for Node A: 3.0650431191546215

Equity for Node B: 0.16518887404348348

Equity for Node C: 3.769768006801895

[3.0650431191546215, 0.16518887404348348, 3.769768006801895]

-----  
ROUND 28 DEFAULTERS

Node A has defaulted in round 28

{'A': True, 'B': True, 'C': False}

There are defaulters from earlier rounds but no new defaulters in the current  
round, algorithm will not proceed for another round.

\*\*\*Checking limited liability and absolute priority for Node A\*\*\*

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595

Relative Payment in to Node A from Node B is 0.4375

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352

Relative Payment in to Node A from Node C is 0.75

Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0

Total payments in to Node A is 3.6504311915462164 in round 28.

- Limited liability is met. Node A made a payment of 3.585388072391595 in round  
28 which is less than or equal to the cash flow (payments in + exogenous cash)  
of 6.650431191546216.

Total nominal obligation for Node A (i.e. p\_bar\_1): 11.0

Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595  
Relative Payment in to Node A from Node B is 0.4375  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352  
Relative Payment in to Node A from Node C is 0.75  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node A is 3.6504311915462164 in round 28.

-Checking absolute priority for Node A in round 28. Nominal obligations is 11.0  
and Dollar payments is 3.585388072391595  
Dollar payments less than nominal obligations. Now checking if all value is paid  
to creditors, i.e. Total cash flow for Node A  
All value i.e. cash flow available to Node A is 6.650431191546216  
-Absolute priority is satisfied for Node A

- Absolute priority is met by Node A in round 28 i.e. either obligations are  
paid in full or all available cash flow (i.e. sum of the payments received by  
the node plus the exogenous operating cash flow) is paid to creditors. Nominal  
obligations were 11.0, Dollar payment was 3.585388072391595 and Total cash flow  
was 6.650431191546216

Node A in round 28 passes candidate clearing vector payment entry checks.

\*\*\*Checking limited liability and absolute priority for Node B\*\*\*

Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404348355 in round 28.

- Limited liability is met. Node B made a payment of 1.486699866391352 in round  
28 which is less than or equal to the cash flow (payments in + exogenous cash)  
of 1.6518887404348355.

Total nominal obligation for Node B (i.e. p\_bar\_2): 16.0  
Total dollar payment (i.e. liabilities) by Node B (i.e. p\_2) is  
1.486699866391352  
Relative Payment in to Node B from Node A is 0.181818181818182  
Total dollar payment (i.e. liabilities) by Node A (i.e. p\_1) is  
3.585388072391595  
Relative Payment in to Node B from Node C is 0.25  
Total dollar payment (i.e. liabilities) by Node C (i.e. p\_3) is 4.0  
Total payments in to Node B is 1.6518887404348355 in round 28.

-Checking absolute priority for Node B in round 28. Nominal obligations is 16.0 and Dollar payments is 1.486699866391352

Dollar payments less than nominal obligations. Now checking if all value is paid to creditors, i.e. Total cash flow for Node B

All value i.e. cash flow available to Node B is 1.6518887404348355

-Absolute priority is satisfied for Node B

- Absolute priority is met by Node B in round 28 i.e. either obligations are paid in full or all available cash flow (i.e. sum of the payments received by the node plus the exogenous operating cash flow) is paid to creditors. Nominal obligations were 16.0, Dollar payment was 1.486699866391352 and Total cash flow was 1.6518887404348355

Node B in round 28 passes candidate clearing vector payment entry checks.

\*\*\*Checking limited liability and absolute priority for Node C\*\*\*

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.585388072391595

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699866391352

Total payments in to Node C is 3.769768006801895 in round 28.

- Limited liability is met. Node C made a payment of 4.0 in round 28 which is less than or equal to the cash flow (payments in + exogenous cash) of 7.769768006801895.

Total nominal obligation for Node C (i.e.  $p_{\text{bar}_3}$ ): 4.0

Total dollar payment (i.e. liabilities) by Node C (i.e.  $p_3$ ) is 4.0

Relative Payment in to Node C from Node A is 0.8181818181818182

Total dollar payment (i.e. liabilities) by Node A (i.e.  $p_1$ ) is 3.585388072391595

Relative Payment in to Node C from Node B is 0.5625

Total dollar payment (i.e. liabilities) by Node B (i.e.  $p_2$ ) is 1.486699866391352

Total payments in to Node C is 3.769768006801895 in round 28.

-Checking absolute priority for Node C in round 28. Nominal obligations is 4.0 and Dollar payments is 4.0

-Absolute priority is satisfied for Node C

- Absolute priority is met by Node C in round 28 i.e. either obligations are paid in full or all available cash flow (i.e. sum of the payments received by the node plus the exogenous operating cash flow) is paid to creditors. Nominal obligations were 4.0, Dollar payment was 4.0 and Total cash flow was 7.769768006801895

Node C in round 28 passes candidate clearing vector payment entry checks.

---

#### CLEARING\_PAYMENT\_VECTOR

Clearing payment vector found in round 28.

[3.585388072391595, 1.486699866391352, 4.0]

Node A pays: 3.585388072391595

Node B pays: 1.486699866391352

Node C pays: 4.0

Default loss incurred by Node A is: 3.0650431191546215

Default loss incurred by Node B is: 0.16518887404348348

Default loss incurred by Node C is: 0

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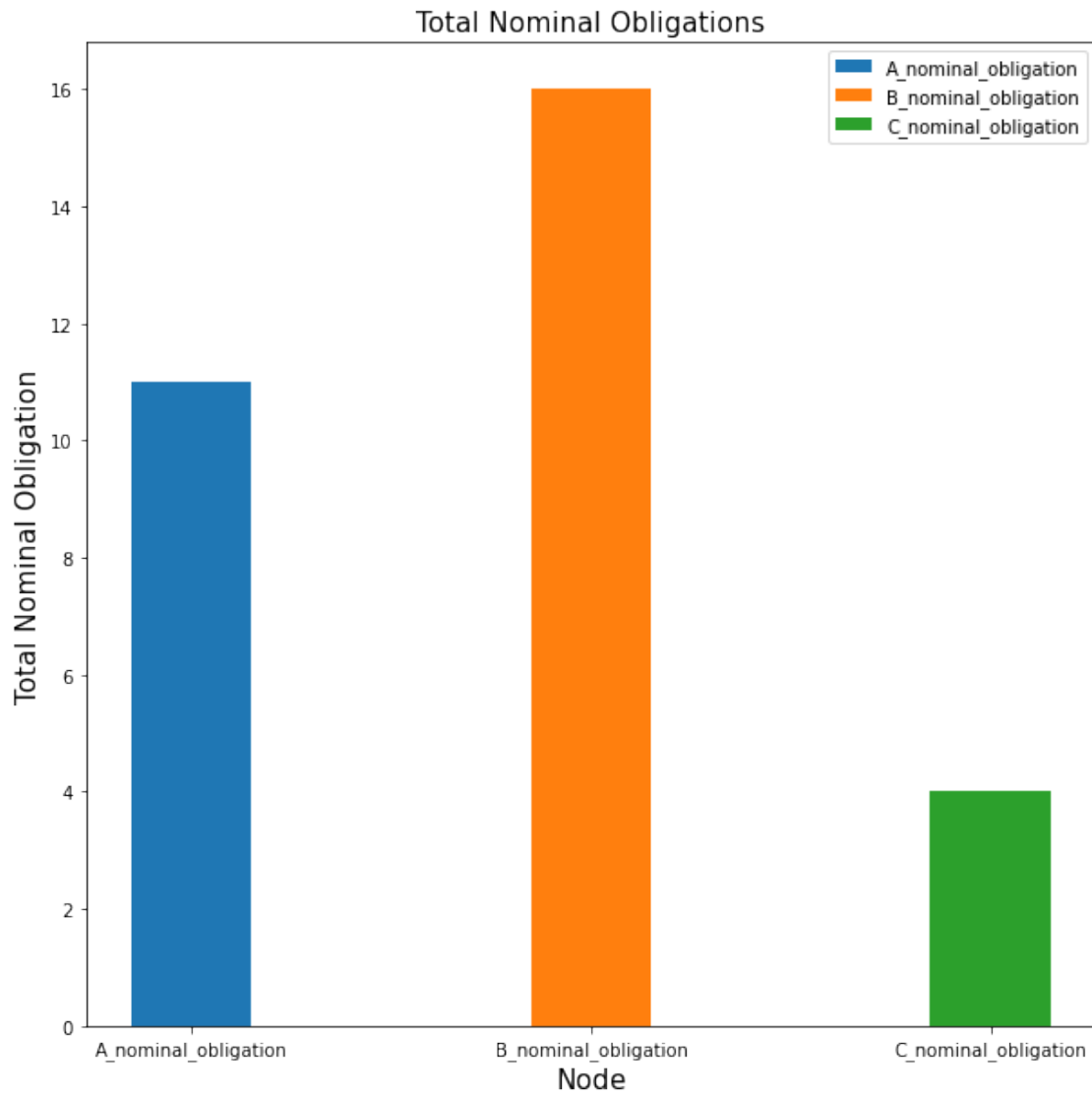
#### END OF ROUND 28

- Systemic Risk: Node A has defaulted in round 1. The number of prior default waves is 0. There are 3 nodes in the system (0 of which have defaulted i.e. []).
- Systemic Risk: Node B has defaulted in round 1. The number of prior default waves is 1. There are 3 nodes in the system (1 of which have defaulted i.e. ['A']).
- Systemic Risk: Node C has not defaulted after 28 rounds. There are 3 nodes in the system (2 of which have defaulted i.e. ['A', 'B']).

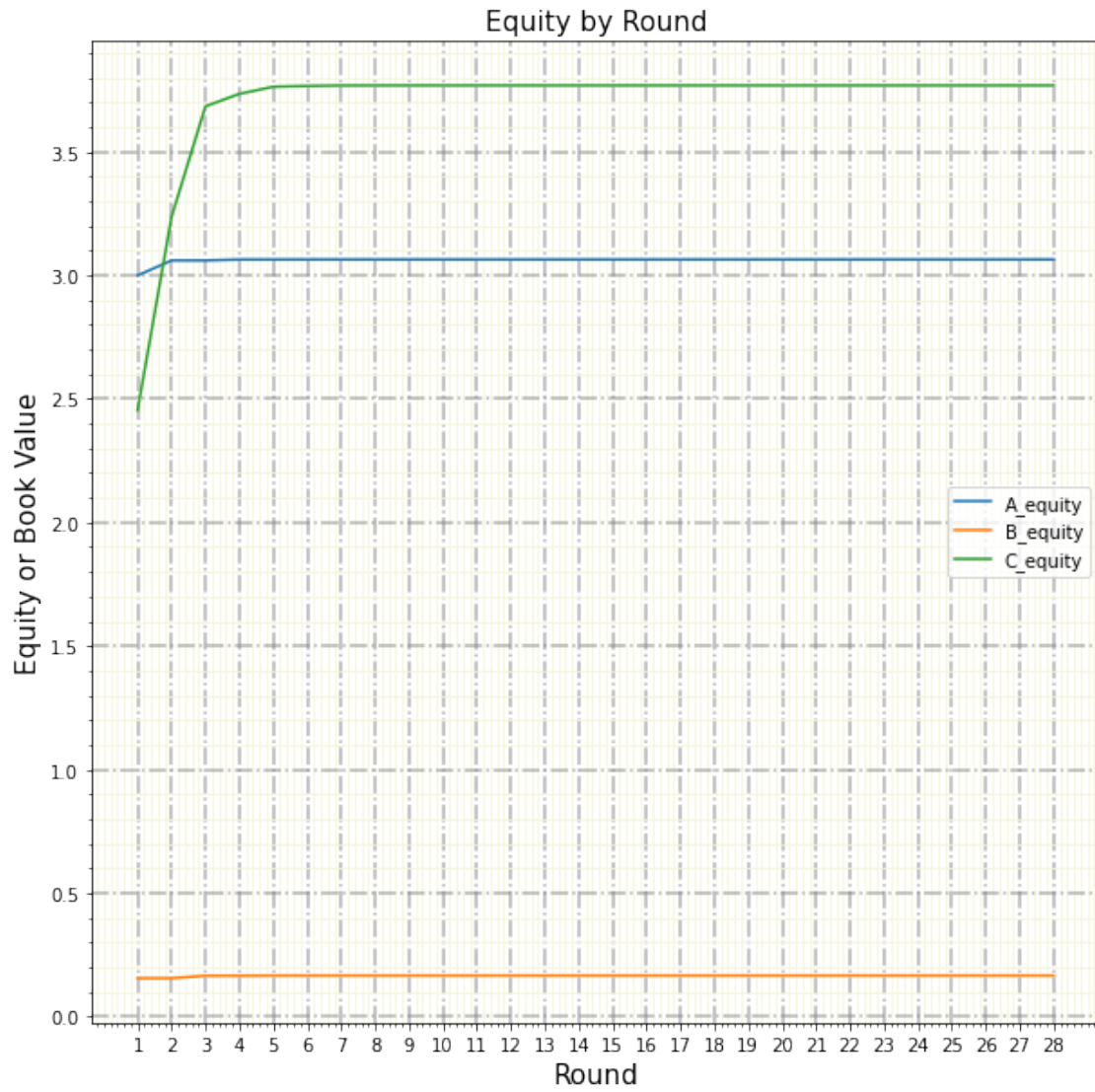
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Scenario 5 - Firm B defaults in first round, Firm A in second round, MODE == 'MANUAL', NUM\_AGENTS = 3, NOMINAL\_LIABILITY\_MATRIX = np.array([[0,2,9],[7,0,9],[3,1,0]]), OPERATING\_CASHFLOW\_BEFORE\_SHOCK = [11, 8, 12], ALPHA = 0.1, BETA = 0.9

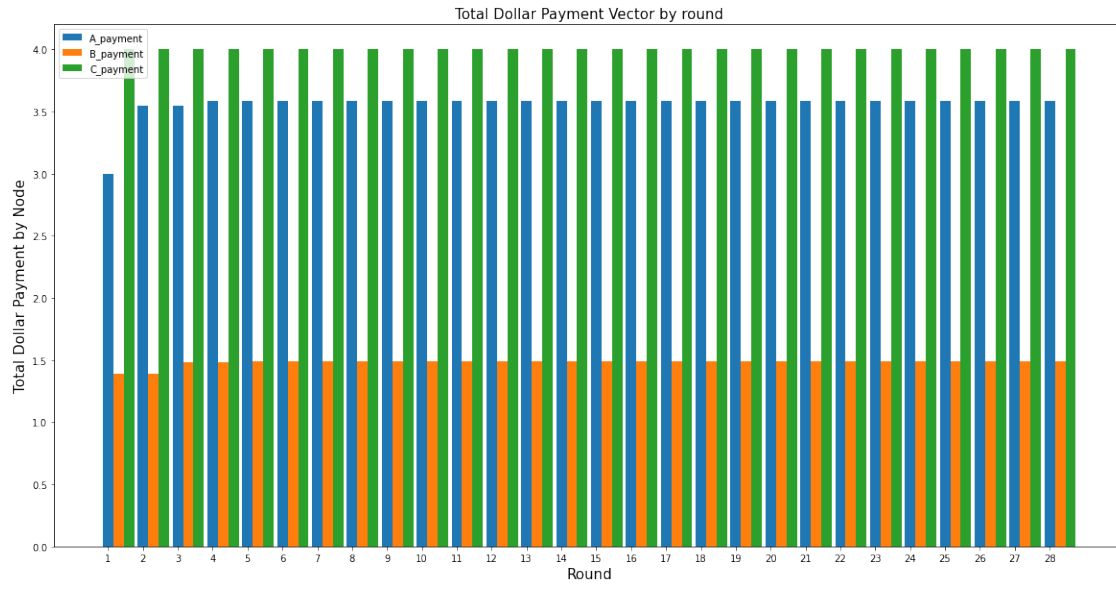
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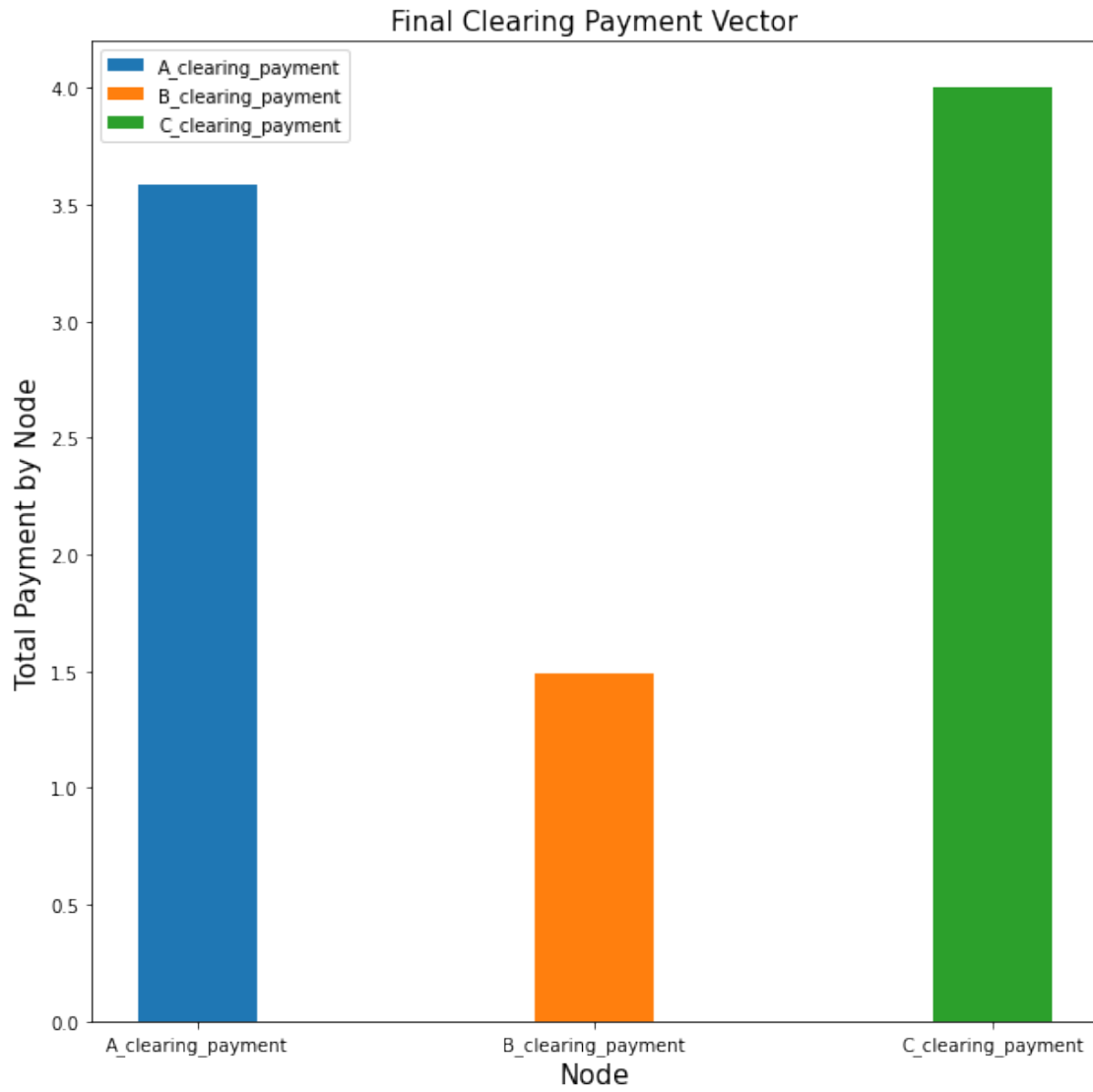
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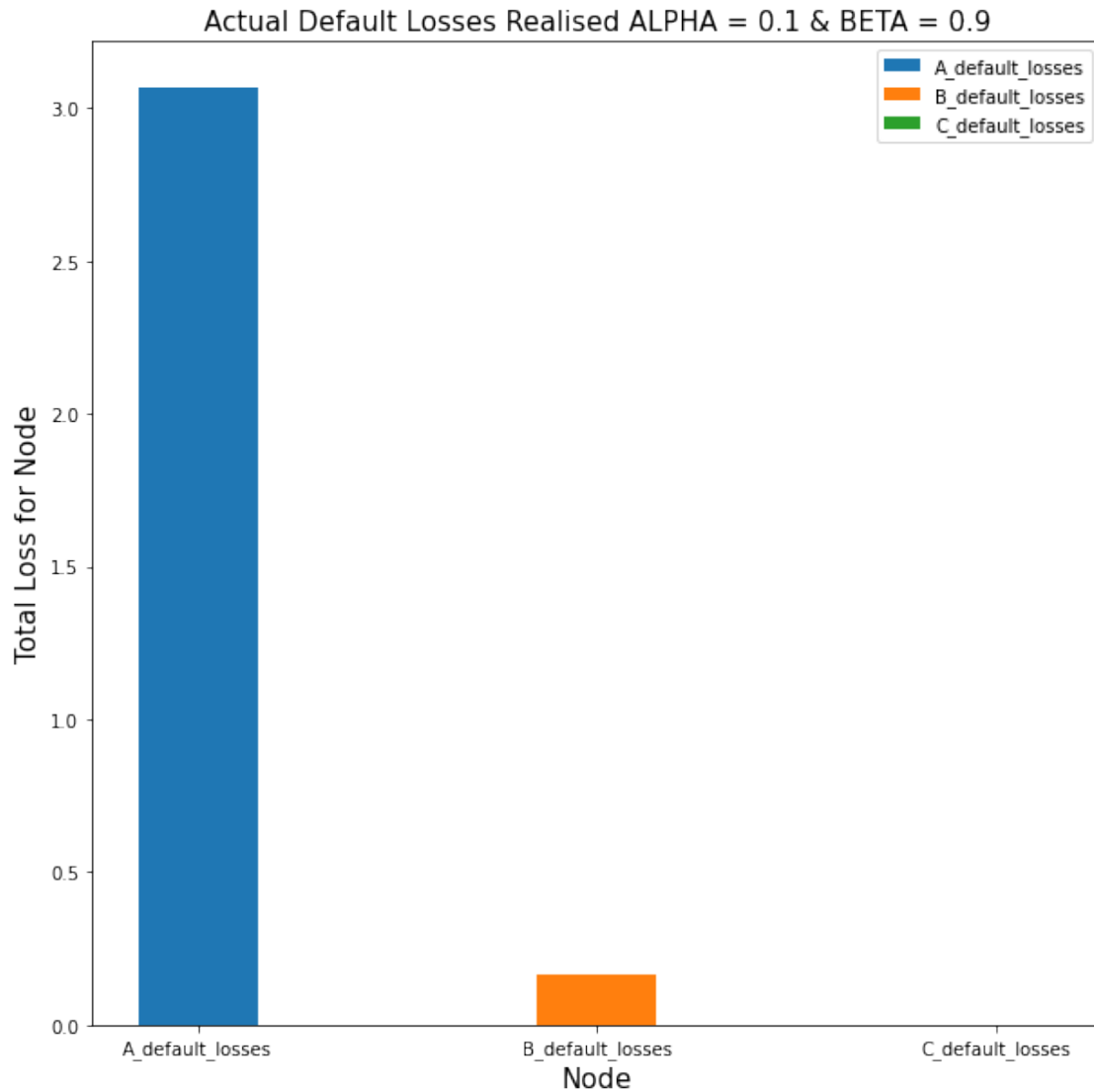




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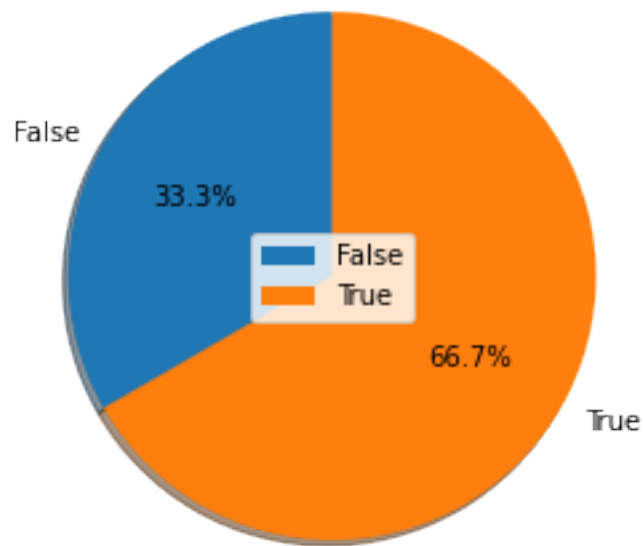
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ALPHA and BETA are the fraction of exogenous assets (outside financial network) and endogenous assets (inside financial network i.e. interbank obligations) that are realised on liquidation in the event of default. The two fractions may conceivably be different; we would typically expect that ALPHA would be low, because the bank would be having to sell off its loan portfolio, probably at a knock-down price or fire sale. In contrast, BETA might be much closer to 1, because an obligation from a solvent bank would probably be paid in full (though perhaps with some negotiated discount to compensate for the inconvenience of early repayment).

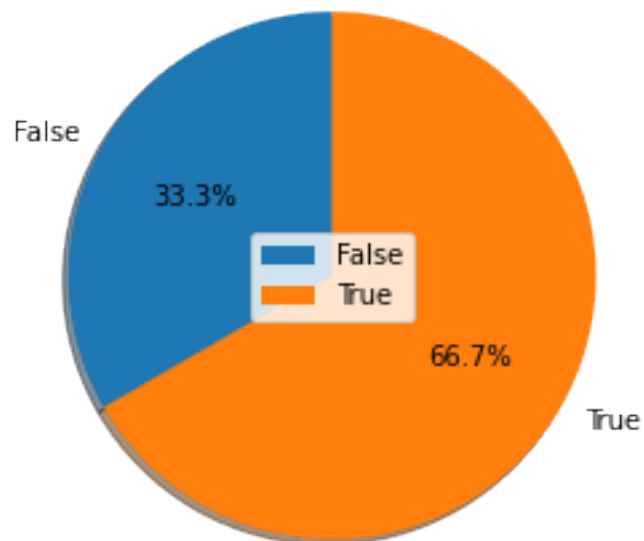
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## Percentage of Defaulters After Round 1



Node A has defaulted in round 1  
Node B has defaulted in round 1  
Node C has NOT defaulted in round 1

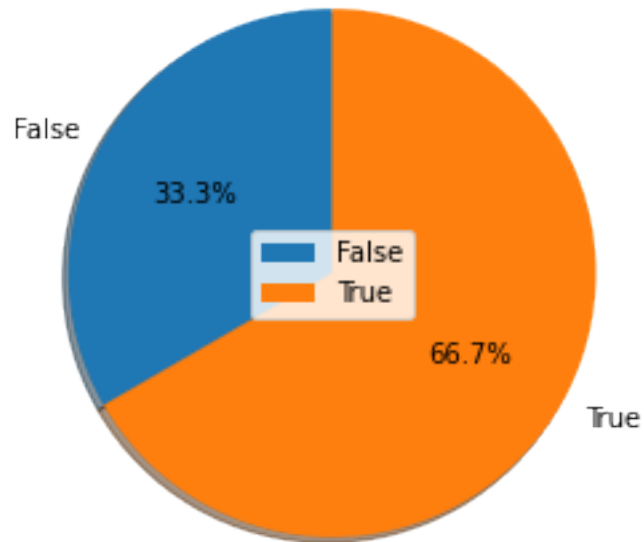
## Percentage of Defaulters After Round 2



Node A has defaulted in round 2

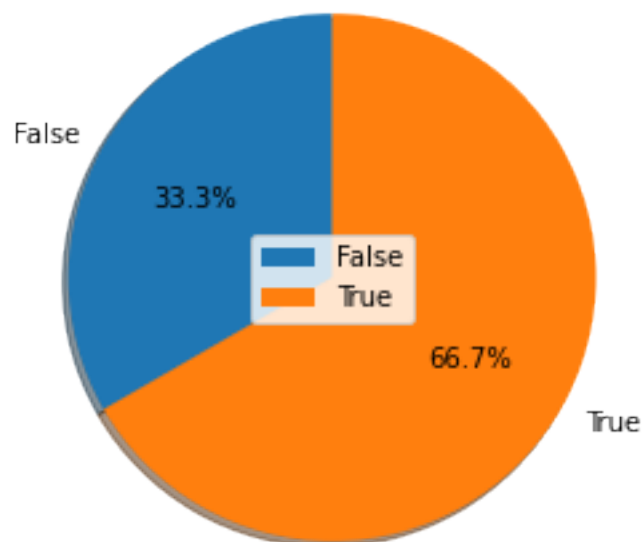
Node B has defaulted in round 2  
Node C has NOT defaulted in round 2

### Percentage of Defaulters After Round 3



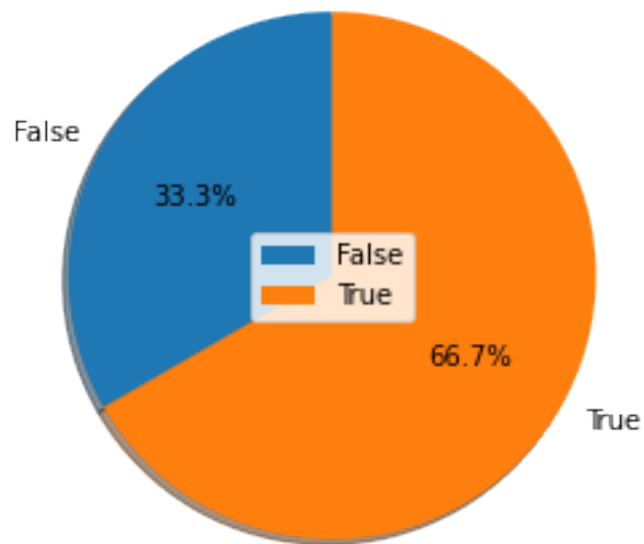
Node A has defaulted in round 3  
Node B has defaulted in round 3  
Node C has NOT defaulted in round 3

### Percentage of Defaulters After Round 4



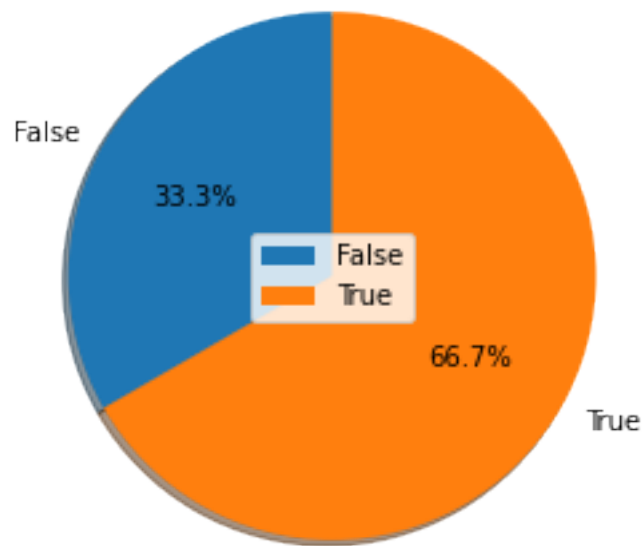
Node A has defaulted in round 4  
Node B has defaulted in round 4  
Node C has NOT defaulted in round 4

### Percentage of Defaulters After Round 5



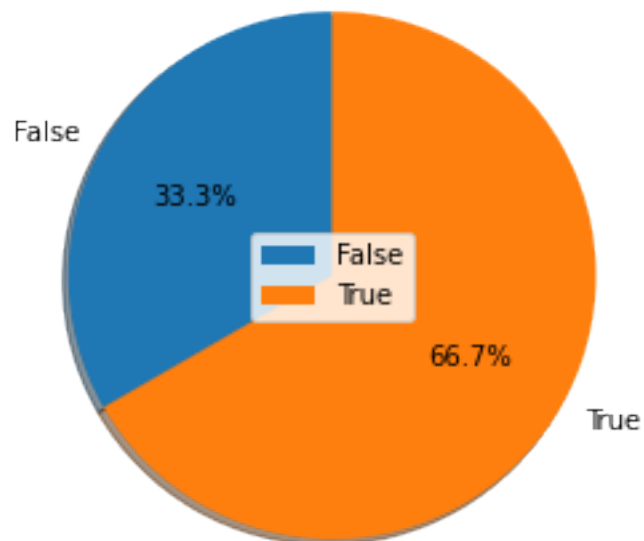
Node A has defaulted in round 5  
Node B has defaulted in round 5  
Node C has NOT defaulted in round 5

## Percentage of Defaulters After Round 6



Node A has defaulted in round 6  
Node B has defaulted in round 6  
Node C has NOT defaulted in round 6

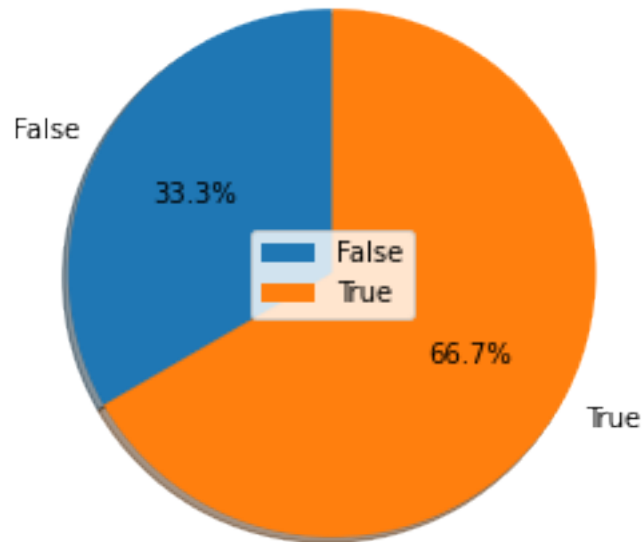
## Percentage of Defaulters After Round 7



Node A has defaulted in round 7

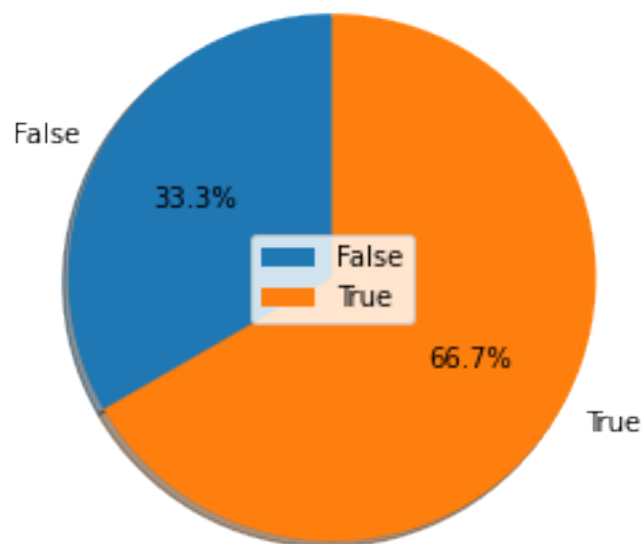
Node B has defaulted in round 7  
Node C has NOT defaulted in round 7

### Percentage of Defaulters After Round 8



Node A has defaulted in round 8  
Node B has defaulted in round 8  
Node C has NOT defaulted in round 8

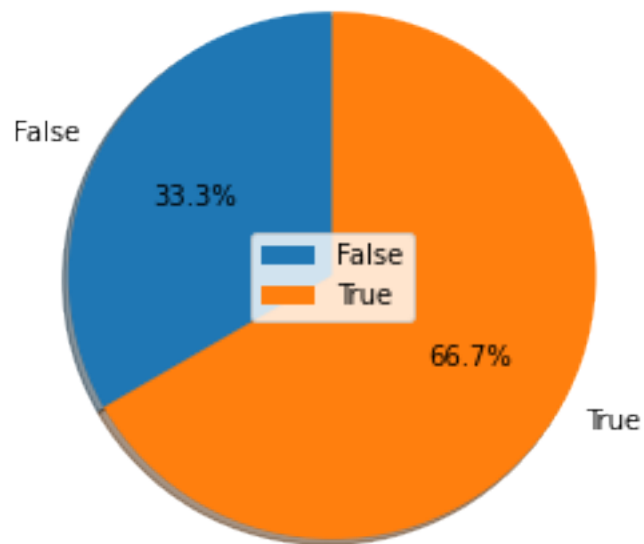
### Percentage of Defaulters After Round 9





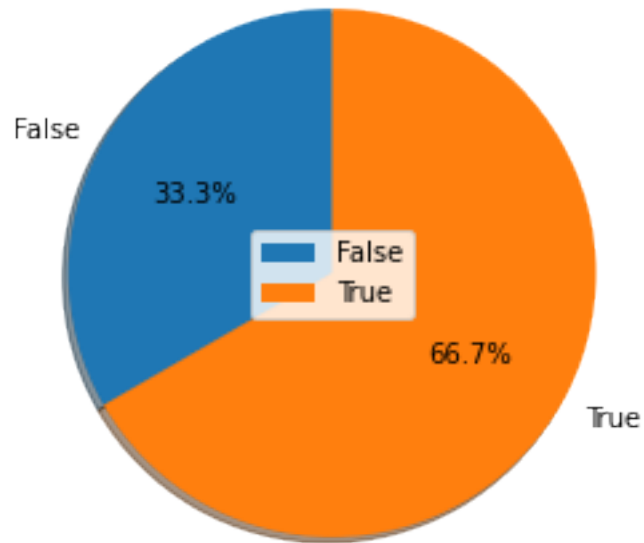
Node A has defaulted in round 9  
Node B has defaulted in round 9  
Node C has NOT defaulted in round 9

### Percentage of Defaulters After Round 10



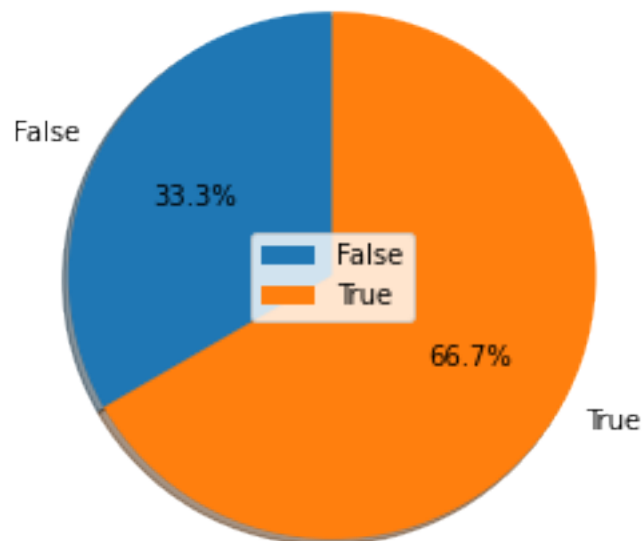
Node A has defaulted in round 10  
Node B has defaulted in round 10  
Node C has NOT defaulted in round 10

## Percentage of Defaulters After Round 11



Node A has defaulted in round 11  
Node B has defaulted in round 11  
Node C has NOT defaulted in round 11

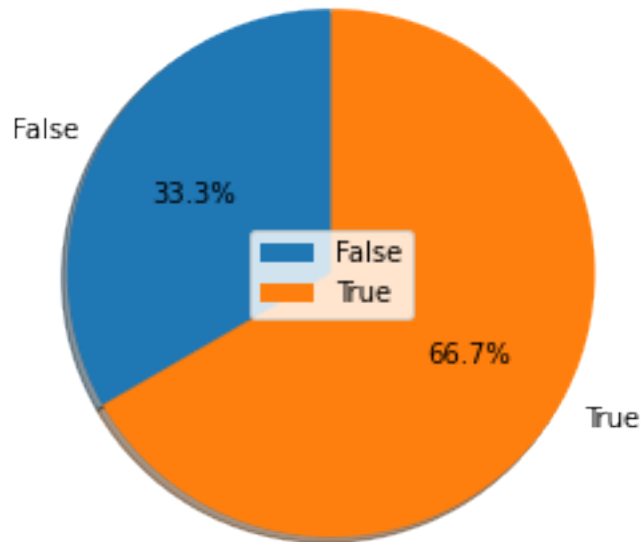
## Percentage of Defaulters After Round 12



Node A has defaulted in round 12

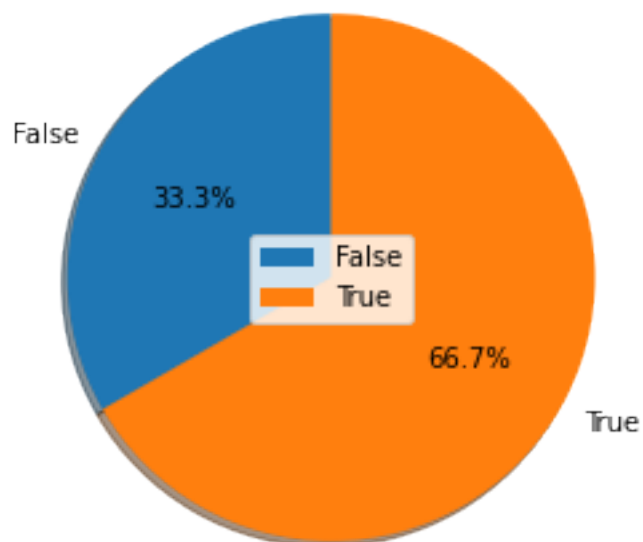
Node B has defaulted in round 12  
Node C has NOT defaulted in round 12

### Percentage of Defaulters After Round 13



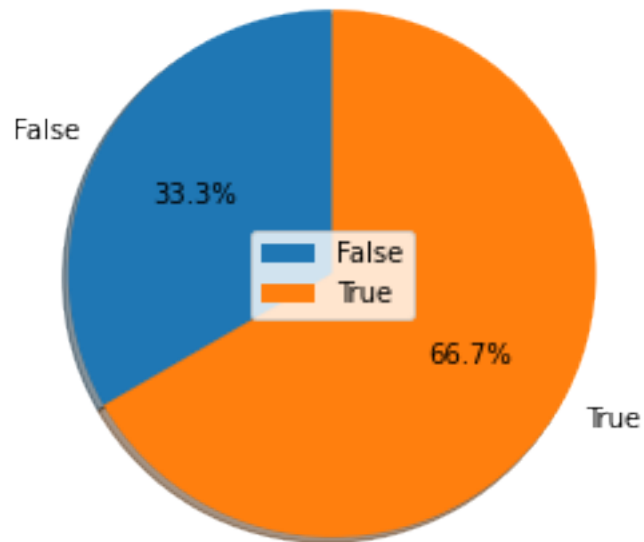
Node A has defaulted in round 13  
Node B has defaulted in round 13  
Node C has NOT defaulted in round 13

### Percentage of Defaulters After Round 14



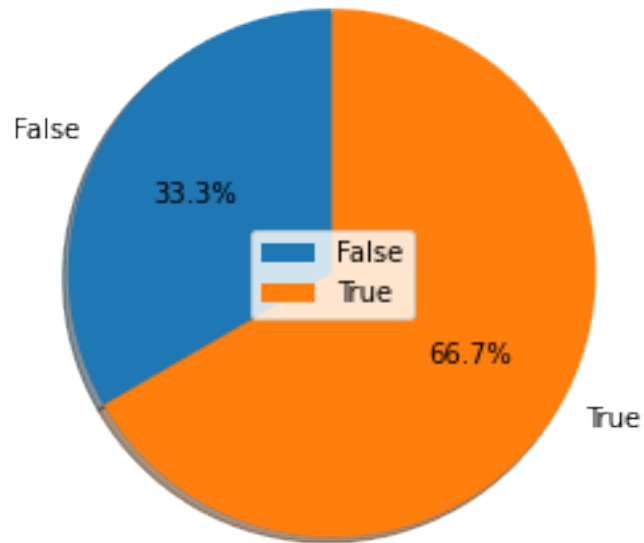
Node A has defaulted in round 14  
Node B has defaulted in round 14  
Node C has NOT defaulted in round 14

### Percentage of Defaulters After Round 15



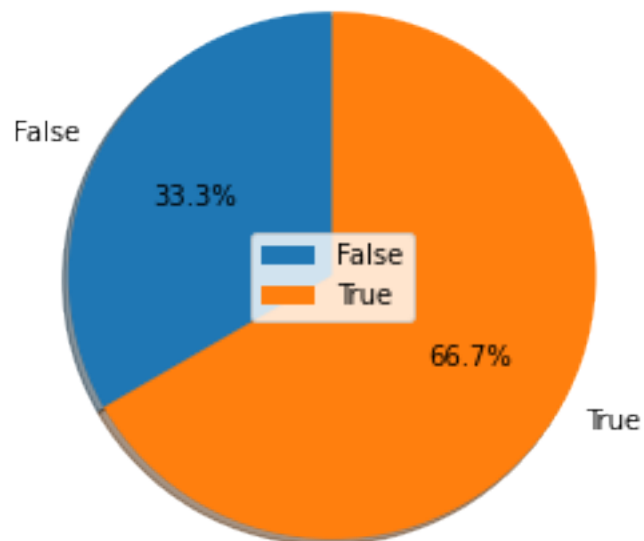
Node A has defaulted in round 15  
Node B has defaulted in round 15  
Node C has NOT defaulted in round 15

## Percentage of Defaulters After Round 16



Node A has defaulted in round 16  
Node B has defaulted in round 16  
Node C has NOT defaulted in round 16

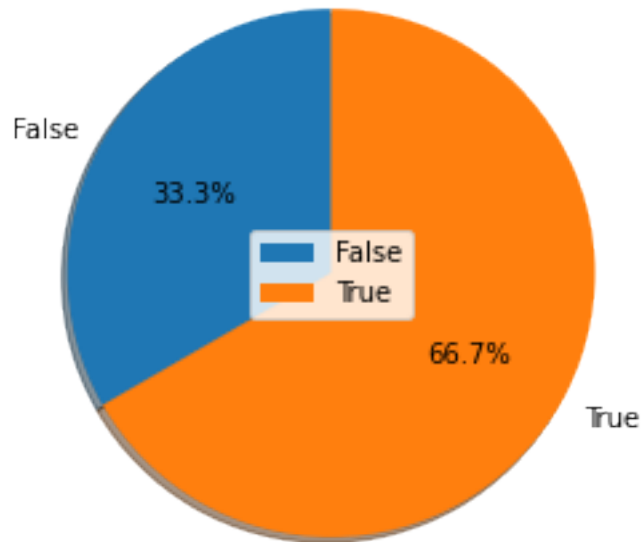
## Percentage of Defaulters After Round 17



Node A has defaulted in round 17

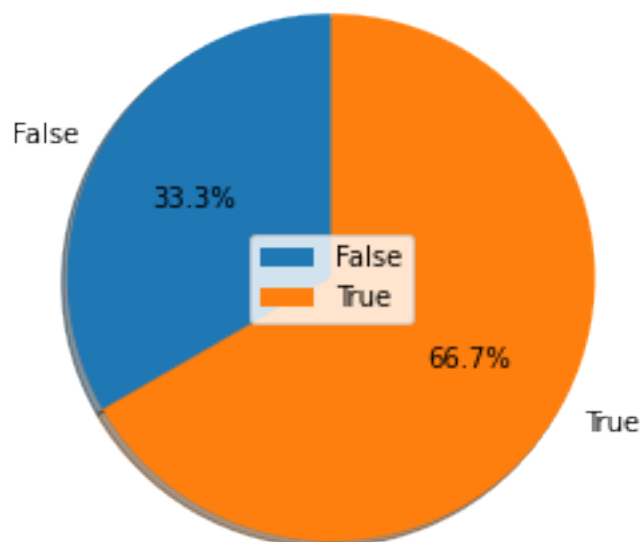
Node B has defaulted in round 17  
Node C has NOT defaulted in round 17

### Percentage of Defaulters After Round 18



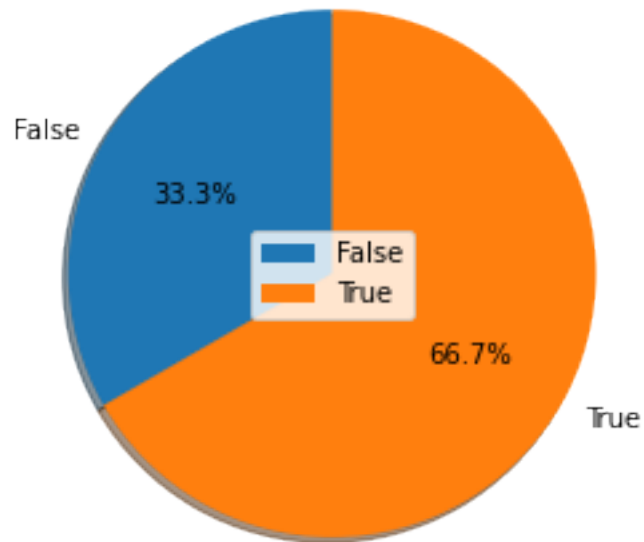
Node A has defaulted in round 18  
Node B has defaulted in round 18  
Node C has NOT defaulted in round 18

### Percentage of Defaulters After Round 19



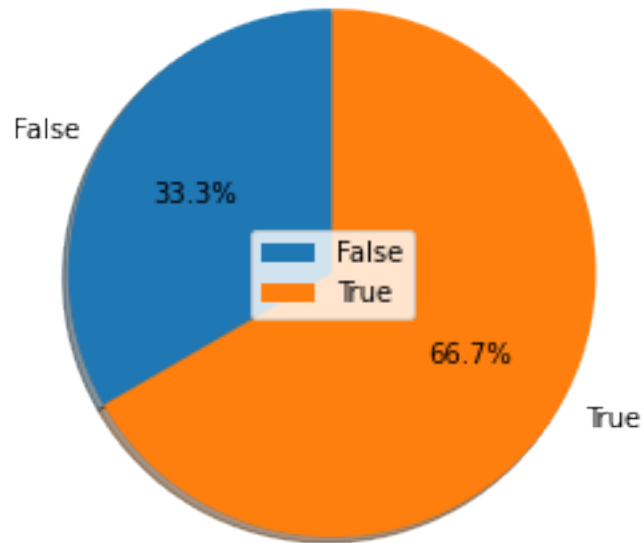
Node A has defaulted in round 19  
Node B has defaulted in round 19  
Node C has NOT defaulted in round 19

### Percentage of Defaulters After Round 20



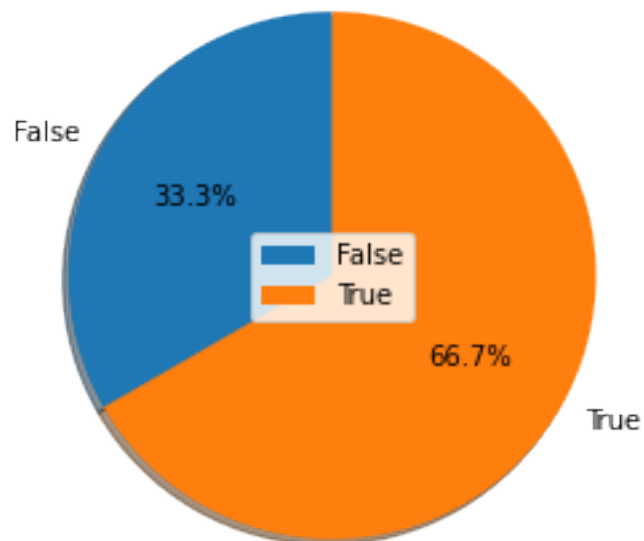
Node A has defaulted in round 20  
Node B has defaulted in round 20  
Node C has NOT defaulted in round 20

## Percentage of Defaulters After Round 21



Node A has defaulted in round 21  
Node B has defaulted in round 21  
Node C has NOT defaulted in round 21

## Percentage of Defaulters After Round 22

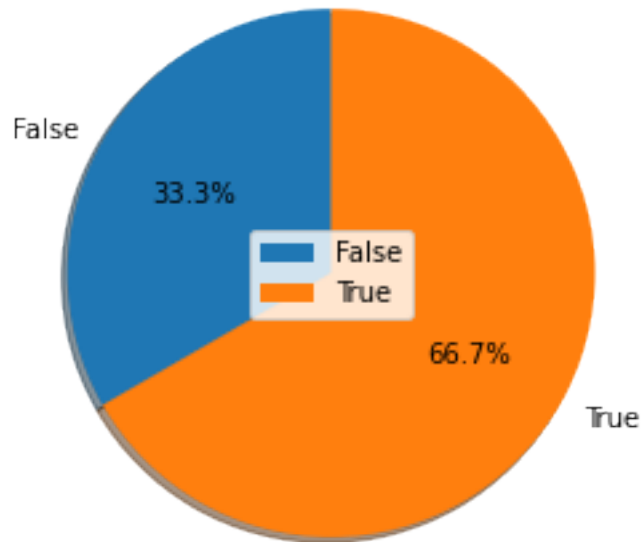


Node A has defaulted in round 22



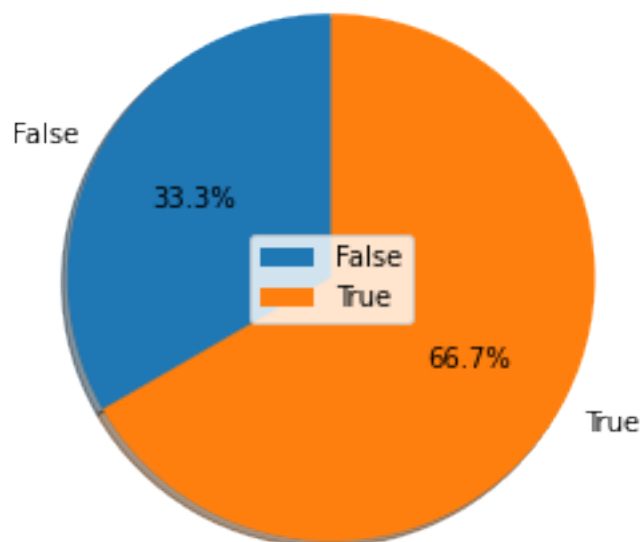
Node B has defaulted in round 22  
Node C has NOT defaulted in round 22

### Percentage of Defaulters After Round 23



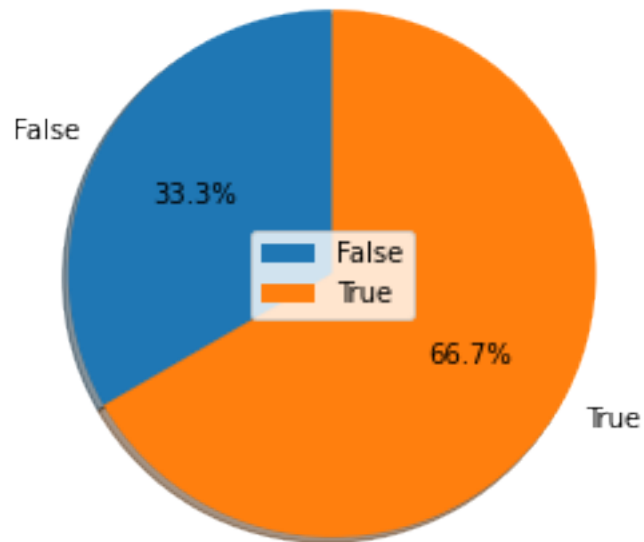
Node A has defaulted in round 23  
Node B has defaulted in round 23  
Node C has NOT defaulted in round 23

### Percentage of Defaulters After Round 24



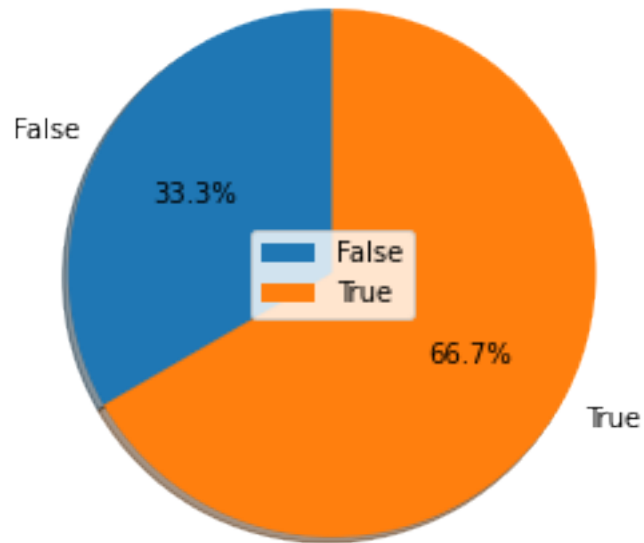
Node A has defaulted in round 24  
Node B has defaulted in round 24  
Node C has NOT defaulted in round 24

### Percentage of Defaulters After Round 25



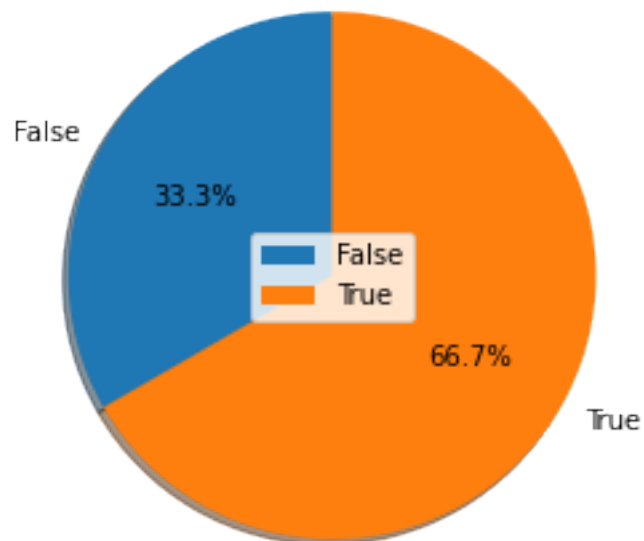
Node A has defaulted in round 25  
Node B has defaulted in round 25  
Node C has NOT defaulted in round 25

## Percentage of Defaulters After Round 26



Node A has defaulted in round 26  
Node B has defaulted in round 26  
Node C has NOT defaulted in round 26

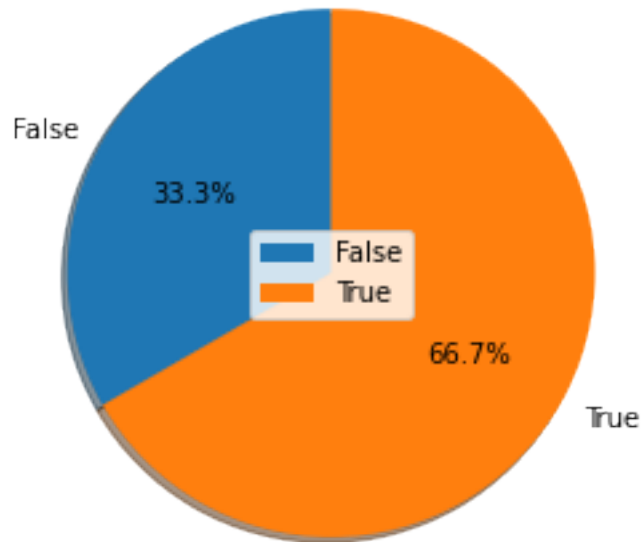
## Percentage of Defaulters After Round 27



Node A has defaulted in round 27

Node B has defaulted in round 27  
Node C has NOT defaulted in round 27

## Percentage of Defaulters After Round 28



Node A has defaulted in round 28  
Node B has defaulted in round 28  
Node C has NOT defaulted in round 28

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