

Step-1

Given that B is similar to A

$$\Rightarrow B = M^{-1}AM$$

Also, C is similar to $B \Rightarrow C = N^{-1}BN$

We consider $C = N^{-1}BN$

$$\begin{aligned} &= N^{-1}(M^{-1}AM)N \\ &= (N^{-1}M^{-1})A(MN) \\ &= (MN)^{-1}A(MN) \end{aligned}$$

Step-2

Assuming $MN = P$, this equation becomes $C = P^{-1}AP$

Therefore C is similar to A .

Considering any non singular matrix M we can write $I = M^{-1}IM$

Therefore, I is similar to I only.