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 $C = N^{-1}BN$

$$= N^{-1}\left(M^{-1}AM\right)N$$
$$= \left(N^{-1}M^{-1}\right)A\left(MN\right)$$
$$= \left(MN\right)^{-1}A\left(MN\right)$$

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.