# My definition of circular relations

This is my first post on this blog. This post is about one of the first mathematical definitions I ever made in my life, which I call circular relations. A circular relation is a binary relation $R$ on a set $S$, such that the following property holds:

$$(\forall x)(\forall y)(\forall z)((xRy \land yRz) \to zRx).$$

Note the contrast with transitivity, where instead of $xRz$ in the consequent, we have $zRx$. An example of a relation having this property is the "defeats" relation in the game of Rock-Paper-Scissors: Rock defeats Scissors, Scissors defeats Paper, but Paper defeats Rock. My next post will be about proving a theorem about circular relations, namely that a binary relation $R$ is an equivalence relation if and only if $R$ is both a reflexive and circular relation.