CONVERGENCE SEMIGROUPS

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In [1], B. Pearson defined convergence spaces and investigated some of their structures. It was pointed out that convergence spaces are much weaker in structure than topological spaces. The purpose of this paper is to define and investigate convergence semigroups along the same line of thought as in chapter 1 of [2]. Although weaker in structure, most of the results discussed in [2] or [3] on topological semigroups are found to be true on convergence semigroups.

Definition. The set D is directed by the relation $\geq$ if (1) for each m in D, $m \geq m$, (2) for each m, n, and p in D, if $p \geq n$ and $n \geq m$, then $p \geq m$, and (3) for each m and n in D, there exists p in D such that $p \geq m$ and $p \geq n$. If D is directed by the relation $\geq$ and $m \in D$, then $\{n \in D \mid n \geq m\}$ will be denoted by mD. The domain and range of a relation f will be denoted by $D(f)$ and $R(f)$ respectively. A net is a map s such that $D(s)$ is a directed set. If