CONSTRUCTION AND STUDY OF A NEW CLASS OF SEMIVECTOR SPACES

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In this paper we introduce a new class of semivector spaces using finite lattices. These semivector spaces contain only finite number of elements but they show some special properties which are not true in a general vector spaces: In general in an n-dimensional semivector space we will never have a set of \((n+1)\) vectors to be linearly independent.

Further we are not in a position to say even if there exists two basis for a semivector space whether they will have same number of elements in them. Not only these conditions are unique in these
semivector spaces but even representation of every element in a semivector space need not in general be unique. Thus in this paper we study these semivector spaces and pose some interesting problems about them.

Finally we study also semivector spaces with infinite number of elements in them using the semifields $Z^0 = Z^+ \cup \{0\}$, $R^0 = R^+ \cup \{0\}$ and $Q^0 = Q^+ \cup \{0\}$. We further prove in case of semivector spaces we do not define dimension for them. We further define basis in semivector spaces with infinite number of elements in them to exists only when the basis is unique. For example, $S = Z^0 \times Z^0$ is a semivector spaces over $Z^0$. This has $\{(0,1), (1, 0)\}$ to be a unique basis. But $\{(1, 1), (2,1), (3,0)\}$ is a linearly independent set in $S$. Thus this leads to an open problem. Can we enumerate the number of linearly independent sets in a semivector space which has a unique basis? Some interesting-results about them are obtained in this paper.