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Manoj Lamichhane* (manoj.lamichhane@uwc.edu), 1500 N University Dr, Waukesha, WI 53188. *Minimal representations of Lie algebras with non-trivial Levi decomposition.* Preliminary report.

We found simple subalgebras of $gl(5, R)$ together with their representations comprising seventeen in all. The semi-simple subalgebras of $gl(5, R)$ are then found together with their representations comprising six cases in total. Each such semi-simple subalgebra acts by commutator on $gl(5, R)$ and the resulting representations are fully decomposed. The results are used to determine all possible solvable extensions of a given semi-simple subalgebra and hence all Levi subalgebras of $gl(5, R)$ are determined up to isomorphism allowing also for the use of companion subalgebra. In this talk, we will present how some of the above Levi Subalgebra are used to find the minimal dimension matrix representations for each of the Lie algebras of dimensions five, six, seven and eight obtained by Turkowski that have a non-trivial Levi decomposition. The key technique involves using the invariant subspaces associated to a particular representation of a semi-simple Lie algebra to help in the construction of the radical in the putative Levi decomposition. (Received September 24, 2018)