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Gerhard O. Michler* (michler@math.cornell.edu), Department of Mathematics, Cornell University, Ithaca, NY 14853. *Constructing finite simple groups from irreducible subgroups of $GL_n(2)$.*

The Brauer-Fowler theorem states that there are only finitely many simple groups G having a given centralizer $H = C_G(z)$ of an involution z of H . Several years ago I published an algorithm constructing these groups G from H , if z is a central involution of a Sylow 2-subgroup S of G which is neither dihedral nor semi-dihedral. Hence S has a maximal characteristic elementary abelian normal subgroup A of order 2^d with $d \geq 2$, and $T = N_G(A)/C_G(A) \leq GL_d(2)$. In this lecture, I present an algorithm which constructs H from a given irreducible subgroup T of $GL_d(2)$. It is theoretically useful and practicable. I will demonstrate it for $3 \leq d \leq 5$ and construct some groups of Lie type and the sporadic groups J_1 , Co_3 and TH of Janko, Conway and Thompson, respectively. (Received December 11, 2006)