Modular Representation of the Unitary Group U3 (4) As Linear Codes

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Citation: KIBU Conference (2017). Innovative Research and Knowledge for Global Competitiveness and Sustainable Development. Proceedings of 2nd Interdisciplinary International Scientific Conference 14 – 15 June 2017. Kibabii University Main campus, Bungoma Kenya ISBN: 978-9966-59-011-4

Abstract

Coding theory deals with methods of constructing and analyzing error-correcting codes and decoding them in an efficient manner. In this paper, we construct some binary linear codes from modular representation of Unitary $U_3(4)$ and determine their properties. We aim to determine linear codes from primitive permutation representations of $U_3(4)$ group using modular representation method ,determine the properties of codes obtained from $U_3(4)$ group and to establish the relationship of these codes with some designs, graphs and finite geometries. We use Magma and meat axe softwares to determine irreducibility of modules. We develop algorithm that determine these codes and add the algorithm to the Magma software. The codes constructed from this group are used in the encoding and decoding of messages, error detection and error correction.

Mathematics Subject Classification: 05B05, 20D45, 94B05

Key Words: *Binary Codes, Combinatorics, Designs and Graphs, Modules*