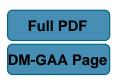
Discussiones Mathematicae General Algebra and Applications 26 (2006) 199–217 doi:10.7151/dmgaa.1112



ON THE MAXIMAL SUBSEMIGROUPS OF THE SEMIGROUP OF ALL MONOTONE TRANSFORMATIONS

ILIYA GYUDZHENOV AND ILINKA DIMITROVA¹

South-West University "Neofit Rilski" Faculty of Mathematics and Natural Science 2700 Blagoevgrad, Bulgaria

e-mail: iliadg@aix.swu.bg

e-mail: ilinka_dimitrova@yahoo.com

Abstract

In this paper we consider the semigroup M_n of all monotone transformations on the chain X_n under the operation of composition of transformations. First we give a presentation of the semigroup M_n and some propositions connected with its structure. Also, we give a description and some properties of the class \tilde{J}_{n-1} of all monotone transformations with rank n-1. After that we characterize the maximal subsemigroups of the semigroup M_n and the subsemigroups of M_n which are maximal in \tilde{J}_{n-1} .

Keywords: transformation semigroup, maximal subsemigroups, idempotent, isotone, antitone and monotone transformations, Green's equivalences.

2000 Mathematics Subject Classification: 20M20.

¹The author acknowledges support from the "Center of Excellence of Pure and Applied Mathematics" to DAAD.

References

- [1] H. Clifford and G.B. Preston, *The algebraic theory of semigroups*, 1. Amer. Math. Soc., Providence, 1961, MR 24#A2627.
- [2] V.H. Fernandes, G.M.S. Gomes and M.M. Jesus, *Presentations for Some Monoids of Partial Transformations on a Finite Chain*, Communications in Algebra **33** (2005), 587–604.
- [3] Il. Gyudzhenov and Il. Dimitrova, On Properties of Idempotents of the Semigroup of Isotone Transformations and it Structure, Comptes rendus de l'Academie bulgare des Sciences, to appear.
- [4] J.M. Howie, Products of Idempotents in Certain Semigroups of Transformations, Proc. Edinburgh Math. Soc. 17 (2) (1971), 223–236.
- [5] J.W. Nichols, A Class of Maximal Inverse Subsemigroups of T_X , Semigroup Forum 13 (1976), 187–188.
- [6] N.R. Reilly, Maximal Inverse Subsemigroups of T_X , Semigroup Forum, Subsemigroups of Finite Singular Semigroups, Semigroup Forum 15 (1978), 319–326.
- [7] Y. Taijie and Y. Xiuliang, A Classification of Maximal Idempotent-Generated, 4 (2002), 243–264.
- [8] K. Todorov and L. Kračolova, On the Rectangular Bands of Groups of D-Classes of the Symmetric Semigroup, Periodica Mathem. Hungarica 13 (2) (1983), 97–104.
- Y. Xiuliang, A Classification of Maximal Inverse Subsemigroups of Finite Symmetric Inverse Semigroups, Communications in Algebra 27 (1999), 4089–4096.
- [10] Y. Xiuliang, A Classification of Maximal Subsemigroups of Finite Order-Preserving Transformation Semigroups, Communications in Algebra 28 (3) (2000), 1503–1513.
- [11] Y. Xiuliang and Lu Chunghan, Maximal Properties of Some Subsemigroups in Finite Order-Preserving Transformation Semigroups, Communications in Algebra 28 (2000), 3125–3135.

Received 19 January 2006 Revised 25 March 2006