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Philatelic Sudoku Puzzles

We consider sheetlets of postage stamps with \( r \) rows and \( c \) columns featuring \( s \) distinct stamps (we do not require that \( rc/s \) be an integer) and where no particular stamp appears more than once in any single row or column and so the sheetlet defines a “Latin rectangle”. The “philatelic Sudoku puzzle” is to find an \( s \times s \) Latin square in which the Latin rectangle defining the sheetlet is a subregion and some blocking within the subregion is involved as with the popular “regular” \( 9 \times 9 \) Sudoku puzzle. We let \( b \) denote the block size and so \( b = 9 \) in regular Sudoku. We identify six philatelic Sudoku puzzles with parameter sets \((r, c, s ; b)\) as follows:

- Abkhazia 2006, marine life, \((8, 3, 12 ; 4)\),
- Hong Kong 2006, musicians, \((6, 3, 6 ; 3)\),
- Pakistan 2005, mushrooms, \((6, 5, 10 ; 5)\),
- USA 1997, musicians, \((5, 4, 8 ; 4)\),
- USA 2005, aircraft, \((5, 4, 10 ; 10)\),
- USA 2007, flowers, \((2, 10, 10 ; 2)\).

For each puzzle we present the solution and some interesting properties of the associated matrices.

This talk is based on Section 6 of the invited paper (with Ka Lok Chu & Simo Puntanen) entitled “Some comments on philatelic Latin squares from Pakistan”, to be published in the Special Jubilee Issue of the Pakistan Journal of Statistics.