

# The spaces extremal for the Gomory-Hu inequality

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In 1961 E.C. Gomory and T.C. Hu proved (see [1]) for finite ultrametric space  $(X, d)$  the inequality  $|\text{Sp}(X)| \leq |X|$  where  $\text{Sp}(X) = \{d(x, y) : x, y \in X\}$ .

Define by  $\mathcal{U}$  the class of finite ultrametric spaces  $X$  with  $|\text{Sp}(X)| = |X|$ . The two criteria characterizing ultrametric spaces  $X \in \mathcal{U}$  are proved in [2]. The first one is given by describing the structural properties of some graphs related to spaces  $X$  and the second one is given in terms of representing trees of finite ultrametric spaces. In this work we give a new criterium in terms of weighted Hamilton cycles related to space  $X$ .

[1] R. E. Gomory and T. C. Hu, Multi-terminal network flows, *SIAM*, **9**(4) (1961), p. 551–570.

[2] E. Petrov and A. Dovgoshey, On the Gomory-Hu inequality, *Ukrainskii Matematychnyi Visnyk*, **10**(4) (2013), p. 469–496.