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17. Control Theory and Optimization

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Assigment Probllem in Consideration of Discounting

The set of admissible solutions (SAS) is defined by system of equalities: $\sum_{i=1}^{n}\sum_{j=1}^{n} x_{ij}z_{ij}^{k} = 1; k = \overline{1,n}; \sum_{j=1}^{n}\sum_{k=1}^{n} x_{ij}z_{ij}^{k} = 1; i = \overline{1,n}; \sum_{i=1}^{n}\sum_{k=1}^{n} x_{ij}z_{ij}^{k} = 1; j = \overline{1,n}; x_{ij}, z_{ij}^{k} \in \{0,1\}, i, i, k = \overline{1,n}$. The objective function (OF) is defined on SAS: $\sum_{k=1}^{n}\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}x_{ij}z_{ij}^{k}(1+\rho) \to max, \rho > 0$. When $\rho = 0$ then this OF is OF of polynomialy solvable classical assigment problem. The stated above assigment problem in consideration of discounting (i. e when ($\rho > 0$) is NP-hard problem and the set of optimums of this problem changes with the increasing ρ. In this work there were also determined adequete conditions in which the assigment problem is polynomaly solvable when $\rho > 0$.