Combinatorial Optimization

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1. Does greedy algorithm work for more general independence systems than matroids? Greedy characterization theorem.
2. Problem 1 - Nathan.
3. Problem 2 -
4. Problem 3 -
5. Problem 4 - Let $\mathbf{A}$ denote the TU matrix. The following facts of determinants must be known:

   (a) Elementary row operations do not change the magnitude of the determinant.

   Let $\mathbf{B}$ be a square submatrix of $\mathbf{A}$. Let $\mathbf{B}'$ denote $\mathbf{B}$ after pivoting. Let a_{ij} denote the pivot element. Three cases:

   (a) $\mathbf{B}$ contains some part of i^{th} row.
   (b) $\mathbf{B}$ contains no part of i^h row, but some part of j^{th} column.
   (c) $\mathbf{B}$ does not contain any part of the i^{th} row or the j^{th} column.