Combinatorial Optimization

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1. Vector - A vector of dimension n is an ordered collection of n elements, which are called components.
2. Vector Space - A set V that is closed under finite vector addition and scalar multiplication. A Vector is an element of a vector space.
3. Matrix, dimension, compatibility of $\mathbf{A} \cdot \mathbf{x} \leq \mathbf{b}$ and $\mathbf{c} \cdot \mathbf{x}$.
4. Linear equation (**cx=d**), linear inequality, linear disequation.
5. System of linear inequalities, equations, constraint matrix, Subsystem.
6. Norm of a vector - positive scalability, triangle inequality, separates points.
7. L_p norm $((\sum_{i=1}^{n} |x_i|^p)^{\frac{1}{p}}$, L_1, L_2, L_∞.
8. distance between vectors x and y.
9. Row and column sub-matrices.
10. Diagonal, upper and lower triangular.
11. Polyhedron is a set determined by linear inequalities $\{x : Ax \leq b\}$.
12. Lattice point.
13. For any subset $T \subseteq S$, characteristic function, x_T.
14. Support of a vector.
15. Convex set.
16. Linear combination of vectors, affine combination, convex combination.
17. Linear hull, affine hull, convex hull.
18. A cone is a set C, such that if $x, y \in C$, then $\lambda \cdot x + \mu \cdot y \in C$, for all $\lambda, \mu, \geq 0$. Are cones convex?
19. The cone generated by a set of vectors X, is the smallest convex cone containing X and is denoted by cone X.
20. Linear independence, affine independence.
21. Spanning set of vectors, basis.
22. Uniqueness of basis representation.