

DISCRETE OPTIMIZATION II

PROBLEM FORMULATION

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PROBLEM: MINE SCHEDULING

As the manager of a company that process mineral to transform it into a final product I need to supply trustable the raw material required by the processing plant. The idea is to obtain the required quality of ore (raw material) but also the quantity that allows the plant to work in full capacity over the long term.



In most of the cases the mine planners develop mine schedules looking for maximizing the NPV of the mining operation. This objective leads to the definition of optimal production rates. However, in this particular case the production rate of the mine is limited by the capacity of the plant that also requires certain quality in the material to process.

The objective is to supply the demand of the plant meeting the quality requirements over the longest time possible. To do this, it is necessary a mathematical procedure that:

- Maximizes the reserves of the mine
- Provides a mine production schedule that allows to meet the ore production target
- Provides a schedule that guarantees the quality of the ore to be processed in the plant
- Provides a schedule that respects physical and economical constraints

The grade tonnage distribution of the deposit and the production target and quality requirement of the plant are provided to solve the problem.

I want to know for how long the mine will supply the requirements of the plant in order to plan the closure of the plant or to find another deposit that supply the raw material.