



Why

1

Definition

We want to allocate a resource among n entities to maximize some measure of “return” or “profit.”

Let $B \in \mathbf{R}$. Let $R_i : \mathbf{R} \rightarrow \mathbf{R}$ be a function which gives the return for allocating entity i the amount x_i of the resource. Let $\mathcal{X} = \{x \in \mathbf{R}^n \mid x \geq 0, \sum_i x_i = B\}$. Define $f : \mathbf{R}^n \rightarrow \mathbf{R}$ by $f(x) = \sum_{i=1}^n R_i(x_i)$. We call the optimization problem (\mathcal{X}, f) a *single-resource allocation problem*. In this case we call $x \in \mathbf{R}^n$ an *allocation* and we call B the *budget*.

Examples

2

¹Future editions will include. For now this sheet serves as an example of a continuous optimization problem.

²Future editions will include the numerous examples.

