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counting problem

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If R is a search problem then $c_R(x) = |\{y \mid R(x)\}|$ is the corresponding counting function and $\#R = \{(x, y) \mid y \leq c_R(x)\}$ denotes the corresponding *counting problem*. Note that c_R is a search problem while $\#R$ is a decision problem, however c_R can be \mathcal{C} Cook reduced to $\#R$ (for appropriate \mathcal{C}) using a binary search (the reason $\#R$ is defined the way it is, rather than being the graph of c_R , is to make this binary search possible).