DEFINITION 1 (Penalty(s)): When applying an enhancement to change product p to p', there is a penalty function to measure the change, which is

$$\text{Penalty}(p') = \frac{\sqrt{(p'-p)^2}}{|p|}$$

PROBLEM 1 (Find the enhancement strategy s to fulfill C with minimal penalty): Given a target region C, where $C \supseteq c$, an enhanced p' should dominate p with the modified region c' satisfies $C \subseteq c'$, while making least penalty. In other words, to:

$$min.\ Penalty(p') \tag{1}$$
$$s.t.\ Rank(C) \leq k \tag{2}$$