Computer Science 789 Online Algorithms

Hint 4 for the Dungeon Searching Problem

Define $G(t)$ to be the treasure in the first t rooms of the greedy path.

Define $A(t)$ to be the treasure in the first t rooms of the other path.

Let $F(t) = \frac{1}{2}G(t) - A(t)$

We need to find a function $\Phi(t)$ for all $0 \leq t \leq n$ such that the following two conditions hold:

$$\Phi(n) \geq 0 \tag{1}$$

$$F(0) \geq \Phi(0) \tag{2}$$

$$\forall(t > 0) F(t) - F(t-1) \geq \Phi(t) - \Phi(t-1) \tag{3}$$

Then $F(n) \geq 0$.