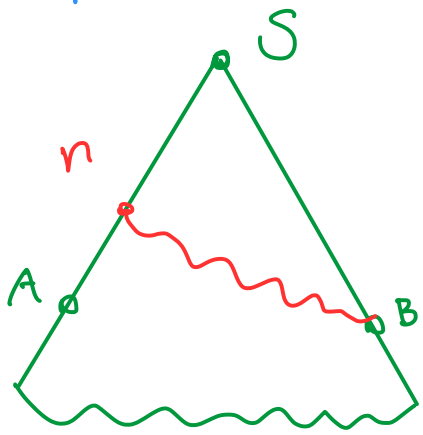
Optimality of A*



A: Opt goal
B: sub-opt goal
} $g(B) > g(A)$ (× 0, × 0)

⇒ Prove: A will be expanded, not B?

Proof: Suppose n, B are in fringe & n ⟶ A (ancestor)

$$f(n) = g(n) + h(n) \le g(n) + \text{true}(n, A)$$
$$= g(A) = g(A) + \underbrace{h(A)}_{=0} = f(A)$$

$f(A) < f(B)$

⇒ $f(n) < f(B)$ ⇒ Expand n earlier than B

every ancestor of A