3. When to stop beam search.

The highest scoring beam B_t scores worse than or equal to $best_{\leq t}$.

Define $S(B_t)$ be to score of a beam B_t. Then

$$S(B_t) \leq best_{\leq t}$$

Assuming at another time t' that $t' > t$ and

$$S(B_{t'}) \leq S(B_t)$$

as probability value are always ≤ 1
hence

$$S(B_{t'}) \leq (best_{\leq t})$$

proved.