

Tight example for Greedy on Set Cover.

$\boxed{1}$     $\boxed{\frac{1}{2}}$     $\boxed{\frac{1}{3}}$     $\dots$     $\boxed{\frac{1}{n}}$

$n+1$  sets,  $n$  elements.

The last set covers everything, with weight  $1+\epsilon$ .

Bad example for Greedy 1: (sorting  $v_i$ )

1 item value  $v$ , weight  $W$ .  $v$

$W$  items value  $v-\epsilon$ , weight 1 each.  $W(v-\epsilon)$

Bad example for Greedy 2 (sorting  $\frac{v_i}{w_i}$ )

1<sup>st</sup> item value  $v$ , weight 1

2<sup>nd</sup> item value  $(v-\epsilon)W$ , weight  $W$ .