Scheduling

$n$ jobs $p_1, p_2, \ldots, p_n$

Online schedule

$T' + p_k$

$T = T' + p_k$

$OPT \geq \frac{\sum_{j=1}^{n} p_j}{m}$

$OPT \geq p_k$

$\leq \frac{\sum_{j=1}^{k} p_k}{m} + p_k$

$\leq OPT - \frac{p_k}{m} + p_k$

$\leq OPT \left(2 - \frac{1}{m}\right)$
List update

Model 1 - original

- cost to access item at depth i = i
- free to move forward by any amount
- adjacent items can be exchanged at cost q = 1

Model 2

- cost to access item at depth i = i
- required to move to front
- adjacent items can be exchanged at cost q = 1

\[ \text{OPT}(\delta) \text{ opt alg in model 1} \]

\[ \text{OPT}' : \text{simulates OPT} \]

\[ \text{OPT}'(\delta) \leq 2 \text{OPT}(\delta) \]

\[ \text{OPT-MODULE2}(\delta) \leq \text{OPT}'(\delta) \]

\[ \text{MTF}(\delta) = \text{OPT-MODULE2}(\delta) \]

- no advantage to paid exchanges
- "exchange argument"