PREFETCH APPLICATION

1. Example considered is **WebSearch**.
2. R_k : $Energy\ cost\ of\ transfer\ of\ a\ page\ which\ is\ k^{th}\ ranked.$
3. P_k : $Probability\ that\ k^{th}\ page\ will\ be\ clicked.$
4. E : $Tail\ Energy.$
5. TE_k : $Total\ energy\ spent\ to\ retrieve\ k^{th}\ page$
6. **IF Prefetching**
   (a) Energy required = $[\sum R_k + E]$
7. **If Not Prefetching**
   (a) Energy required = $[\sum P_k \cdot (R_k + E)]$
   (b) $= \sum P_k \cdot R_k + E \cdot \sum P_k$
   (c) $Energy\ saved = \frac{N_{pre} - Pre}{TE}$
   (d) $= \frac{\sum P_k R_k + E \cdot \sum P_k - \sum R_k - E}{\sum (R_k + E)}$
   (e) $= \frac{E \cdot (\sum P_k - 1) - \sum (1 - P_k R_k)}{\sum (R_k + E)}$