1. DP. Let $f[i]$ denote the maximum value we can get by partitioning $A[1..i]$. $O(nk)$.
2. DP, use a dynamic data structure to maintain the lower envelope of the transitions, where each transition $f[i] + \alpha_i(j - i) \to f[j]$ is a segment in 2D (where $\alpha_i = \max_{i+1 \le k \le j} A[k]$ at time j). maintain the slopes α_i of the transitions by monotone queue, where the total number of changes of the slopes is $O(n)$. $O(n \log n)$.

References