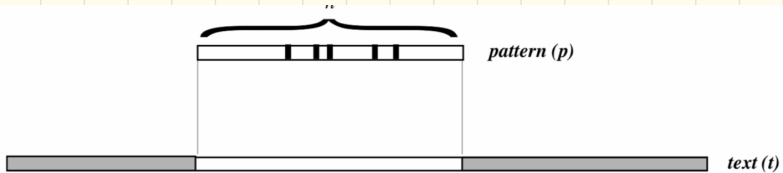*Back to pattern matching in our book:*

Approximate Pattern Matching Problem:
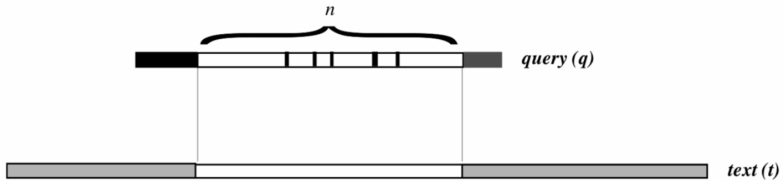*Find all approximate occurrences of a pattern in a text.*

Input: A pattern $\mathbf{p} = p_1 p_2 \ldots p_n$, text $\mathbf{t} = t_1 t_2 \ldots t_m$, and parameter k, the maximum number of mismatches.

Output: All positions $1 \leq i \leq m - n + 1$ such that $t_i t_{i+1} \ldots t_{i+n-1}$ and $p_1 p_2 \ldots p_n$ have at most k mismatches (i.e., $d_H(\mathbf{t}_i, \mathbf{p}) \leq k$).

(a) Approximate Pattern Matching

(b) Query Matching

Query Matching Problem:
Find all substrings of the query that approximately match the text.

Input: Query $\mathbf{q} = q_1 \ldots q_p$, text $\mathbf{t} = t_1 \ldots t_m$, and integers n and k.

Output: All pairs of positions (i, j) where $1 \leq i \leq p - n + 1$ and $1 \leq j \leq m - n + 1$ such that the n-letter substring of $\mathbf{q}$ starting at i approximately matches the n-letter substring of $\mathbf{t}$ starting at j, with at most k mismatches.