edit distance

i The edit distance at position $e(i,j)$ is same as $e(i-1, j-1)$ if $a_i = b_j$, else it is equal to the minimum cost of deleting, replacing or inserting plus 1 for current mismatch.

ii
$$e(i,j) = \begin{cases} \text{return } 1, & \text{if } i=0 \text{ or } j=0 \\ e(i-1, j-1), & \text{if } a_i = b_j \\ 1 + \min(e(i-1, j-1), & \text{if } a_i \neq b_j \\ \quad e(i-1, j), & \\ \quad e(i, j-1) & \end{cases}$$

iii pseudocode

```
for i = 0 → n, e(i, 0) = 1
for j = 0 → m  e(0, j) = 1
for i = 1 → n
    for j = 1 → m
        if a_i = b_j
        then, e(i, j) = e(i-1, j-1)
        else, e(i, j) = 1 + min( e(i-1, j-1),
                                 e(i, j-1),
                                 e(i-1, j))

return e(n, m)
```

iv $O(nm)$