Refined version of outer loop invariant (Chatgpt)

Just before the start of the ith iteration of the outer loop (for i such that startA ≤ i ≤ finishA), the polynomial $\sum_{K=startA}^{i-1} terms[K] \cdot B(x)$ — that is, the sum of the partial products formed by multiplying each term terms[K] of polynomial A (for K < i) with the polynomial B — has been correctly computed and stored in the terms array between indices startx and finishx as polynomial x.

Initialization: i = startA. The range K = startA to i-1 does not make sense. ∴ The outer loop invariant trivially holds.

Maintenance: Let, the outer loop invariant hold just before the start of the iteration when $i = x'$ ∴ $\sum_{K=startA}^{x'-1} terms[K] \cdot B(x)$ is correctly computed and has been stored in the terms array between indices startx and finishx as polynomial x

- By correctness of inner loop, (lines 9-10), the partial product terms[x'] * B(x) has been correctly computed and stored in the terms array by the attach function. We know, the current posn. of avail is the leftmost memory block just to the right of the last term of the polynomial terms[x'] * B(x). (Refer to pf of correctness of inner loop)
- If i = startA, then only the 1st partial product term has been computed and we rightly stop further iteration of the loop and move on to the next iteration (lines 11-12).
- Otherwise, finishy and starty is initialized to the finishing and starting posns. of the polynomial terms[x'] * B(x).