2. Each exponent is unique within a polynomial. There are no duplicate exponents (eg: no two terms like $3x^2+4x^2$ — these would already be combined during construction).

While Loop Invariant

- At the beginning of each loop iteration, for all exponents exp > max(terms[startA].expon, terms[startB].expon) s.t. $\exists i,j$ where ($0 \le i <$ startA and exp = terms[i].expon) or (finishA+1 $\le j <$ startB and exp = terms[j].expon), we have already calculated the correct corresponding coefficient for x^{exp} in the polynomial D.

Initialization: At the beginning of the 1st iteration, startA = 0, startB = finishA+1. This is according to our original representation where polynomial B is just after polynomial A. The index $0 \le i <$ startA = 0 and finishA+1 $\le j <$ finishA+1 doesn't logically make sense. ∴ The Loop invariant automatically holds.

Maintenance: Let, startA = x and startB = y. $0 \le x <$ finishA and startB = finishA+1 $\le y <$ finishB. Let, the loop invariant hold just before the start of this iteration.

∴ For all exponents exp > max(terms[x].expon, terms[y].expon) s.t. $\exists i,j$ where ($0 \le i < x$ and exp = terms[i].expon) or (finishA+1 $\le j <$ y and exp = terms[j].expon), we have already calculated the corresponding coefficient for x^{exp} in the polynomial D.

- From lines 5–19, we can see that we have a switch block. In the switch condn. on line 5 we compare terms[x].expon and terms[y].expon. Suppose, wlog, terms[x].expon < terms[y].expon. ∴ COMPARE will return −1 and lines 6–9 will be evaluated. By correctness of attach function, the coefficient of terms[y] along with the respective