I have completed this assignment individually, without support from anyone else. I hereby accept that only the below listed sources are approved to be used during this assignment:

(i) course textbook
(ii) all material that is made available to me by the professor
(iii) notes taken by me during lectures

I have not used, accessed or taken any unpermitted information from any other source. Hence, all effort belongs to me.

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```
Node {
Node next
double coeff
int power}

Node Create Node (coeff, power){
    new node(coeff, power)}

void add node(head, coeff, power){
  if (no head){
    new head}
  else
    go to last node
    if (powers are same) add coeff;
    else new node(coeff, power)
    return head}

Node multiply(Node1, Node2){
Node 3 = null
Node first
Node second
  while(first != null)
      while (second != null)
          add node(Node3, coeff 1 and 2, power 1 and 2)
        second++
    first++
  toparla(Node3)
return Node3}}

Node add(Node1, Node2){
  Node first
  Node second
  Node 3
  while (first != null){
  add first to 3}
  while (second != null){
    add second to 3}?
  toparla(Node 3)
  return Node 3}
```

```
Toparla(Node 3)
Node first                int power, coeff
Node second
  while (1 != null)
      while(2 != null
        if 2.power > 1.power
          swap
        second++
    first++
  return Node 3
```

Time complexity

adding node is $O(n)$
toparla is $O(n)$
Node is $O(n)$
add is $O(n)$
multiply is $n \cdot m = O(n^2)$

So overall time complexity is $O(n^2)$

Space complexity

each node has double coeff, Node next and int power
n nodes take $O(n)$ space. multiplying takes n by m space. n is first polynom, m is second polynom. m.n nodes. Addition takes $n+m = O(n)$ space. Node number is less than m+n. In toparla, ther are 4 variables which takes $O(n)$ space complexity. Overal space is $O(n^2)$