



Data Structures

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Session: Applications of Linked Lists: Merge 2 Ordered Lists, Polynomial Manipulation

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Data Structures Operations on Lists



- Merge two sorted Singly Linked Lists
 Algorithm Merge_Sorted_Lists(head1, head2):
 - 1. while head $2 \neq NULL$ do
 - 1.1 Set data ← head2.data
 - 1.2 Set head2 ← Delete_Front(head2)
 - 1.3 Set head1 ← Insert_Order(head1, data)
 - 2. end while
 - return head1

End Algorithm

```
NODE merge_sorted_lists(NODE Head1, NODE Head2)
2
      while (Head2 != NULL) {
3
           int data = Head2->data;
4
          Head2 = del_front(Head2);
5
          Head1 = insert_order(Head1, data);
6
7
      return Head1;
8
9
```



Data Structures Operations on Lists



Polynomial Operations

Construct Polynomial Node

- Add additional data component power.
- data part to be used as coeff

Build Polynomial

- create node and insert into polynomial list in order(as per power value)
- In case there is a node with same power value, add the coefficients and update the node.

Add 2 Polynomials

Create a function to accept 2 polynomial headers and add them to a separate list and return the new header.



Data Structures Operations on Lists



- Polynomial Operations
- Display Polynomial
 - Function to take Polynomial Header as input and display the polynomial in the form of $2x^2 + 3x^1 + 2x^0 = 0$
- Evaluate Polynomial
 - Function to take Polynomial Header, value of x as input and display the value of the polynomial.



Thank You

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