**Assignment 3**

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1. **Write a program to implement Polynomial addition using linked list.**

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| #include <stdio.h>  #include <stdlib.h>  struct poly  {      int coeff;      int exp;      struct poly \*next;  };  struct poly\* add(struct poly \*p1, struct poly \*p2)  {      struct poly \*head3 = NULL, \*p3 = NULL;      while(p1 != NULL && p2 != NULL)      {          if (head3 == NULL)          {              head3 = p3 = (struct poly\*)malloc(sizeof(struct poly));              p3->next = NULL;          }          else          {              p3->next = (struct poly\*)malloc(sizeof(struct poly));              p3 = p3->next;              p3->next = NULL;          }          if(p1->exp == p2->exp)          {              p3->coeff = p1->coeff + p2->coeff;              p3->exp = p1->exp;              p1 = p1->next;              p2 = p2->next;          }          else if(p1->exp > p2->exp)          {              p3->coeff = p1->coeff;              p3->exp = p1->exp;              p1 = p1->next;          }          else          {              p3->coeff = p2->coeff;              p3->exp = p2->exp;              p2 = p2->next;          }      }      while(p1 != NULL)      {          p3->next = (struct poly\*)malloc(sizeof(struct poly));          p3 = p3->next;          p3->coeff = p1->coeff;          p3->exp = p1->exp;          p1 = p1->next;          p3->next = NULL;      }      while(p2 != NULL)      {          p3->next = (struct poly\*)malloc(sizeof(struct poly));          p3 = p3->next;          p3->coeff = p2->coeff;          p3->exp = p2->exp;          p2 = p2->next;          p3->next = NULL;      }      return head3;  }  struct poly\* accept\_poly(int n)  {      struct poly \*head, \*p;      int i;      head = p = (struct poly\*)malloc(sizeof(struct poly));      p->next = NULL;      printf("Enter coefficients with exponents:\n");      scanf("%d %d", &p->coeff, &p->exp);      for(i = 1; i < n; i++)      {          p->next = (struct poly\*)malloc(sizeof(struct poly));          p = p->next;          p->next = NULL;          scanf("%d %d", &p->coeff, &p->exp);      }      return head;  }  void print\_poly(struct poly \*p)  {      while(p != NULL)      {          printf("%dx^%d ", p->coeff, p->exp);          if (p->next != NULL)              printf("+ ");          p = p->next;      }      printf("\n");  }  int main()  {      struct poly \*poly1, \*poly2, \*poly3;      int n1, n2;      printf("Enter no. of terms in each polynomial: ");      scanf("%d %d", &n1, &n2);        poly1 = accept\_poly(n1);      print\_poly(poly1);      poly2 = accept\_poly(n2);        print\_poly(poly2);      poly3 = add(poly1, poly2);      printf("Resultant polynomial after addition: ");      print\_poly(poly3);        free(poly1);      free(poly2);      free(poly3);      return 0;  } |

Output:

