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papergrid

Date: 14/12/20

LAB PROGRAM 11

Write a program to perform addition of two polynomial functions.

```
#include <stdio.h>
#include <process.h>
#include <math.h>
struct NODE
{
    float cf;
    float px;
    float py;
    int flag;
    struct NODE *link;
};
typedef struct NODE *node;
node getnode()
{
    node x;
    x = (node) malloc (sizeof(struct NODE));
    if (x == NULL)
    {
        printf("Memory is full. \n");
        exit(0);
    }
    return x;
}
node insert_rear(float cf, float x, float y, node head)
{
    node temp, cur;
    int flag;
    temp = getnode();
```

```

temp → cf = cf;
temp → px = x;
temp → py = y;
temp → flag = 0;
cur = head → link;
while (cur → link != head)
    cur = cur → link;
cur → link = temp;
temp → link = head;
return head;

```

```

}

```

```

node read_polynomial(node head)
{

```

```

{

```

```

    int i;

```

```

    float cf, px, py;

```

```

    printf("Enter the coefficient as -999 to
           end the polynomial: \n");

```

```

    for(i=0; ; i++)
    {

```

```

        {

```

```

            printf("Enter term %d: \n", i+1);

```

```

            printf("Coefficient: ");

```

```

            scanf("%f", &cf);

```

```

            if(cf == -999)

```

```

                break;

```

```

            printf("Pow of x: ");

```

```

            scanf("%f", &px);

```

```

            printf("Pow of y: ");

```

```

            scanf("%f", &py);

```

```

            head = insert_rear(cf, px, py, head);

```

```

        }

```

```

    return head;

```

```

}

```



```

node add-polynomial (node h1, node h2, node h3)
{
    node p1, p2;
    int x1, x2, y1, y2, cf1, cf2, cf;
    p1 = h1 → link;
    while (p1 != h1)
    {
        x1 = p1 → px;
        y1 = p1 → py;
        cf1 = p1 → cf;
        p2 = h2 → link;
        while (p2 != h2)
        {
            x2 = p2 → px;
            y2 = p2 → py;
            cf2 = p2 → cf;
            if (x1 == x2 && y1 == y2)
                break;
            p2 = p2 → link;
        }
        if (p2 != h2)
        {
            cf = cf1 + cf2;
            p2 → flag = 1;
            if (cf != 0)
                h3 = insert-rear(cf, x1, y1, h3);
        }
        else
            h3 = insert-rear(cf1, x1, y1, h3);
        p1 = p1 → link;
    }
    p2 = h2 → link;
    while (p2 != h2)

```

```
{
    if (p2 → flag == 0)
    {
        h3 = insert_rear (p2 → cf, p2 → px, p2 → py, h3);
    }
    p2 = p2 → link;
}
return h3;
}
void display (node head)
{
    node temp;
    if (head → link == head)
    {
        printf ("Polynomial does not exist. \n");
        return;
    }
    temp = head → link;
    while (temp != head)
    {
        if (temp → cf >= 0)
        {
            if (temp → link != NULL)
                printf (" + ");
        }
        printf ("%5.1f x^%3.1f y^%3.1f", temp → cf,
                temp → px, temp → py);
        temp = temp → link;
    }
    printf ("\n");
}
int main()
{
```



```
node h1, h2, h3;  
h1 = getnode();  
h2 = getnode();  
h3 = getnode();  
h1 → link = h1;  
h2 → link = h2;  
h3 → link = h3;  
printf("Enter the first polynomial: \n");  
h1 = read_polynomial(h1);  
printf("\nEnter the second polynomial: \n");  
h2 = read_polynomial(h2);  
h3 = add_polynomial(h1, h2, h3);  
printf("\n The first polynomial: \n");  
display(h1);  
printf("\n The second polynomial: \n");  
display(h2);  
printf("\n The sum of the 2 polynomials: \n");  
display(h3);  
}
```