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Polynomial Derivative & Integral Calculator

Bonus Weight-Age Code

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Code:

```c
#include<stdio.h>
#include<stdlib.h>
int main()
{
    //All the Inputs are Here.
    int i,j=0,k,num,option;
    printf("What do you Want to perform:\n1.Differentiation\n2.Integeration\n");
    scanf("%d",&option);
    printf("Enter Terms:");
    scanf("%d",&num);
    float ans[num];
    float cof[num];
    float power[num];
    char sign[num];
    //All the Calculation is being done here.
    switch(option)
    {
        case 1:
        {
            for (i=0;i<num;i++)
            {
                printf("Sign:");
                scanf("\n%c",&sign[i]);
                printf("Co-officient:");
                scanf("%f",&cof[i]);
                //printf("\n%.1fx^",cof[i]));
                printf("Power:");
                scanf("%f",&power[i]);
                //printf("%.1f",power[i]);
                ans[i]=cof[i]*power[i];
            }
            //All the printing processes are being done here.
            printf("\nf(x) = ");
            for (i=0;i<num;i++)//this loop is working for printing only f(x).
            {
                printf(" %c%.1fx^%.1f d(x)",sign[i],cof[i],power[i]);
            }
            printf("\nf'(x)= ");
            for (i=0;i<num;i++)//this loop is working fot printing f'(x).
            {
                if (power[i]<0)
                {
                    if(sign[i]=='+')// for -ve power and +ve co-officient
                    {
                        printf(" %.1fx^%.1f",ans[i],power[i]-1);
                    }
                    else if (sign[i]=='-')// for -ve power and -ve co-officient
                    {
                        printf(" +%.1fx^%.1f",-1*ans[i],power[i]-1);
                    }
                }
                else if (power[i]==0)
                {
                    printf(" %c0",sign[i]);// if power=0 the term will become 0.
                }

                else if(power[i]<=1)
                {
                    printf(" %c%.1f",sign[i],ans[i]);//if power=1 then there will be no subtraction in power.
                }
                else if(power[i]>1)
                {
                    printf(" %c%.1fx^%.1f",sign[i],ans[i],power[i]-1);
                }
                printf(" +C");
            }
            break;
        }
```

```
        case 2:
        {
            for (i=0;i<num;i++)
            {
                printf("Sign:");
                scanf("\n%c",&sign[i]);
                printf("Co-officient:");
                scanf("%f",&cof[i]);
                //printf("\n%.1fx^",cof[i]));
                printf("Power:");
                scanf("%f",&power[i]);
                //printf("%.1f",power[i]);
                ans[i]=cof[i]/(power[i]+1);
            }
            //All the printing processes are being done here.
            printf("\nf(x) = ");
            for (i=0;i<num;i++)//this loop is working for printing only f(x).
            {
                printf(" %c%.1fx^%.1f",sign[i],cof[i],power[i]);
            }
            printf("\nf'(x)= ");
            for (i=0;i<num;i++)//this loop is working fot printing f'(x).
            {
                if (power[i]<0)
                {
                    if(sign[i]=='+')// for -ve power and +ve co-officient
                    {
                        printf(" %.1fx^%.1f",ans[i],power[i]+1);
                    }
                    else if (sign[i]=='-')// for -ve power and -ve co-officient
                    {
                        printf(" +%.1fx^%.1f",-1*ans[i],power[i]+1);
                    }
                }
                else if(power[i]>=0)
                {
                    printf(" %c%.1fx^%.1f",sign[i],ans[i],power[i]+1);
                }
            }
        }
    }
}
```

Outputs:

```
What do you Want to perform:
1.Differentiation
2.Integeration
1
Enter Terms:3
Sign:-
Co-officient:3
Power:4
Sign:+
Co-officient:6
Power:4.5
Sign:-
Co-officient:6
Power:-8

f(x) =  -3.0x^4.0  +6.0x^4.5  -6.0x^-8.0 d(x)
f'(x)=  -12.0x^3.0 +27.0x^3.5 +48.0x^-9.0 +C
--------------------------------
```

```
What do you Want to perform:
1.Differentiation
2.Integeration
2
Enter Terms:3
Sign:-
Co-officient:3
Power:6
Sign:+
Co-officient:5
Power:9.4
Sign:-
Co-officient:7
Power:0

f(x) =  -3.0x^6.0 +5.0x^9.4 -7.0x^0.0d(x)
f'(x)=  -0.4x^7.0 +0.5x^10.4 -7.0x^1.0 +C
--------------------------------
```