////Created By Ritwik Chandra Pandey on 24/02/21
////183215
////Polynomial Operations Using Arrays

```
#include <stdio.h>
#include <stdlib.h>
#define MAX 10
void display(int arr[MAX + 1], int power) {
   int i;
   for(i = power; i > =0; i--) {
      printf("%d X^ %d --> ", arr[i], i);
   }
   printf("%d X^ %d\n",arr[i],i);

}

void create(int arr[MAX + 1], int power) {
   int i;
   for(i = power; i >= 0; i--) {
      printf("Enter coeff value for %d", i);
      printf(" degree term : ");
      scanf("%d", &arr[i]);
   }
}

void add(int head1[MAX + 1], int hpow1, int head2[MAX + 1], int hpow2) {
   int polyAdd[MAX + 1] = {0}, hpow = 0, i;
   hpow = (hpow1 > hpow2) ? hpow1 : hpow2;
   for (i = hpow; i >= 0; i--) {
      polyAdd[i] = head1[i] + head2[i];
   }
   printf("Addition polynomial is : ");
   display(polyAdd, hpow);
}
```

```
void sub(int head1[MAX + 1], int hpow1,
        int head2[MAX + 1], int hpow2) {
   int polySub[MAX + 1] = {0}, hpow = 0, i;
   hpow = (hpow1 > hpow2) ? hpow1 : hpow2;
   for (i = hpow; i >= 0; i--) {
      polySub[i] = head1[i] - head2[i];
   }
   printf("Subtraction polynomial is : ");
   display(polySub, hpow);
}


void mul(int head1[MAX + 1], int hpow1, int head2[MAX + 1], int hpow2) {
   int polyMul[MAX + 1] = {0}, hpow = 0, i, j;
   hpow = hpow1 + hpow2;
   if (hpow >= MAX) {
      printf("Array is overflow\n");
   } else {
      for(i = hpow1; i >= 0; i--) {
         for(j = hpow2; j >= 0; j--) {
            polyMul[i + j] = polyMul[i + j]
            + head1[i] * head2[j];
         }
      }
      printf("Multiplication polynomial is : ");
      display(polyMul, hpow);
   }
}



int main(){
   int selection=0;
```

```
printf("\t\tPolynomial Operations Using Arrays\n\n");

int hpow1, hpow2;
int head1[MAX + 1] = {0},
head2[MAX + 1] = {0};
printf("Enter highest power of first"
      " polynomial : ");
scanf("%d", &hpow1);
printf("Enter first polynomial : \n");
create(head1, hpow1);
printf("Enter highest power of second"
      " polynomial : ");
scanf("%d", &hpow2);
printf("Enter second polynomial : \n");
create(head2, hpow2);



do{



   printf("\t1.ADD\n\t2.SUBTRACT\n\t3.MULTIPLICATION\n\t4.EXIT\n");

   printf("\t\n Please enter your choice\n");
   scanf("%d",&selection);


   switch(selection){


case 1:
add(head1, hpow1, head2, hpow2);
          selection=4;
   break;
case 2:
sub(head1, hpow1, head2, hpow2);
```

```
            selection=4;
        break;
    case 3:
    mul(head1, hpow1, head2, hpow2);
                selection=4;
        break;
    case 4:
        exit(1);
    default:
        printf("Please enter correct choice\n");
    }

    }while(selection!=4);
}
```