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Program 1	
PROBLEM STATEMENT :	*Write a program to swap smallest and largest element in an array using pointers.*
ALGORITHM:	Step 1: Start Step 2: Declare Variable and take a input from user on size of array. Step 3: Declare Array. Step 4: Using for loop take the input in the array by user. Step 5:Call function minmax. Step 6: Using for loop print the arrray. Step 7:End *Algorithm for function minmax(int *arr, int n) :* Step 1: Declare two integer pointers Step 2: In both pointer store the address of arr[0]. Step 3:Using for loop and if condition and store the largest and smallest value address in both pointer respectively. Step 4:Call function Swap. *Algorithm for function swap(int *y, int*x) :* Step 1: declare variable. Step 2: Store the value of y to that variable. Step 3: Store the value of x to the y . Step 4: Store the value of temp to x.

PROGRAM:

```c
#include <stdio.h>
void swap(int *y, int *x)
{
    int temp;
    temp = *y;
    *y = *x;
    *x = temp;
}
void minmax(int *arr, int n)
{
    int *a;
    int *b;
    a = &arr[0];
    b = &arr[0];
    for (int i = 0; i < (n - 1); i++)
    {
        if (*a < arr[i + 1])
        {

            a = &arr[i + 1];
        }
    }
    for (int i = 0; i < (n - 1); i++)
    {
        if (*b > arr[i + 1])
        {
            b = &arr[i + 1];
        }
    }
    swap(b, a);
}
int main()
{
    int n = 0;
    printf("Enter the number of elements in array\n");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the array elements\n");
    for (int i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    minmax(arr, n);
    for (int i = 0; i < n; i++)
```

```
    {
        printf("%d ", arr[i]);
    }
        printf("\n");
    return 0;
}
```

RESULT:

```
Enter number of elements in array
5
Enter the array elements
12 54 7 59 23
12 54 59 7 23
```

Program 2	
PROBLEM STATEMENT :	*Write a program to reverse the position of all elements in the 2D array using pointers.*
ALGORITHM:	Step 1: Read dimensions of matrix from user input and store it in x and y. Step 2: Declare an array arr of size y*x and populate it with integers read from user input. Step 3: execute function reversearr(y,x,arr) Step 4: print the reversed array. *Algorithm for function reversearr(int y, int x, int arr[y][x]) :* Step 1: Declare two pointers start and end. Step 2: initialize start to the first address in the array, that of arr[0][0] and end to the last element, arr[y-1][x-1]. Step 3: initialize a variable c to 0. Step 5: swap the contents of locations pointed by start and end. Step 6: increment start by 1, and decrement end by 1. Step 7: if c<x*y/2, increment c and return to step 5.

PROGRAM:	`// Write a program to reverse the position of all elements in the 2D array using`
	`// pointers.`
	
	`#include<stdio.h>`

```c
void swap(int *a, int *b){
    int temp;
    temp=*a;
    *a=*b;
    *b=temp;
}
void printarr(int y,int x, int arr[y][x]){
    int digitsmax=0,max=*(*(arr+0)+0);
    for(int i=0;i<y;i++){
        for(int j=0;j<x;j++){
            if(*(*(arr+i)+j)>max){*(*(arr+i)+j);}
        }
    }
    if(max<0){
        digitsmax=1;
        max=-1*max;
    }
    while(max>0){
        digitsmax++;
        max=max/10;
    }
    for(int i=0;i<y;i++){
        for(int j=0;j<x;j++){
            printf("%*d  ",digitsmax,*(*(arr+i)+j));
        }
        printf("\n");
    }
}
void reversearr(int y,int x,int arr[y][x]){
    int *start=(*(arr+0)+0);
    int *end=(*(arr+y-1)+x-1);
    for(int c=0;c<y*x/2;c++){
        swap(start,end);
        start++;
        end--;
    }
}
int main(){
    int y,x;
    printf("Enter the dimensions of the matrix(rows x columns): ");
    scanf("%d%d",&y,&x);
    int arr[y][x];
    printf("Enter the elements of the array:\n");
    for(int i=0;i<y;i++){
```

```
        for(int j=0;j<x;j++){
            scanf("%d",(*(arr+i)+j));
        }
    }
    reversearr(y,x,arr);
    printf("The reversed array is:\n");
    printarr(y,x,arr);
return 0;
}
```

RESULT:

```
Enter the dimensions of the matrix(rows x columns): 3 3
Enter the elements of the array:
122 54 6
33 91 20
2 7 44
The reversed array is:
44   7   2
20  91  33
 6  54  122
```

Program 3

PROBLEM STATEMENT: *Write a program to calculate the subtraction of matrices using pointers. Dimensions of the matrix will be decided by the user.*

PROGRAM:

```
#include<stdio.h>
void printarr(int y,int x, int arr[y][x]){
    int digitsmax=0,max=*(*(arr+0)+0);
    for(int i=0;i<y;i++){
        for(int j=0;j<x;j++){
            if(*(*(arr+i)+j)>max){*(*(arr+i)+j);}
        }
    }
    if(max<0){
        digitsmax=1;
        max=-1*max;
    }
    while(max>0){
        digitsmax++;
        max=max/10;
    }
    for(int i=0;i<y;i++){
        for(int j=0;j<x;j++){
            printf("%*d  ",digitsmax,*(*(arr+i)+j));
        }
```

```
        printf("\n");
    }
}
void arr_difference(int y, int x, int array1[y][x], int
array2[y][x],int diffarray[y][x]){
    int *start1=&array1[0][0];
    int *start2=&array2[0][0];
    int *start3=&diffarray[0][0];
    for(int i=0;i<y*x;i++){
        *start3=*start1-*start2;
        start1++;
        start2++;
        start3++;
    }
}
int main(){
    int y,x;
    printf("Enter dimensions of the matrices(rows*columns):  ");
    scanf("%d %d",&y,&x);
    int array1[y][x];
    int array2[y][x];
    printf("Enter elements of first matrix(marrix to be subjected
from):\n");
    for(int i=0;i<y;i++){
        for(int j=0;j<x;j++){
            scanf("%d",&array1[i][j]);
        }
    }
    printf("Enter elements of second matrix(matrix to be
subtracted):\n");
    for(int i=0;i<y;i++){
        for(int j=0;j<x;j++){
            scanf("%d",&array2[i][j]);
        }
    }
    int diffarray[y][x];
    arr_difference(y,x,array1,array2,diffarray);
    printarr(y,x,diffarray);
return 0;
}
```

RESULT:

```
Enter dimensions of the matrices(rows*columns):  3
3
Enter elements of first matrix(marrix to be subjected from):
12 12 12
12 12 12
12 12 12
Enter elements of second matrix(matrix to be subtracted):
1 2 3
4 5 6
7 8 9
11  10   9
 8   7   6
 5   4   3
```