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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:** | #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:** | |
| **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>  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:** | |
| **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:** | |