/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q1.Write a program that will initialize an integer array and

display all its elements

\*\*/

#include<stdio.h>

int main()

{

    int arr[5]={1,2,3,4,5},i;

    for(i=0;i<5;i++)

    {

        printf("%d,",arr[i]);

    }

    return 0;

}

/\*\*

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Q2.Write a program that will input n numbers and display the minimum.

\*\*/

#include<stdio.h>

int main()

{

    int arr[10],i,n,l=0;

    printf("Enter how many numbers you are going to enter:\n");

    scanf("%d",&n);

    printf("Enter some numbers:\n");

    for (i=0;i<n;i++)

    {

        scanf("%d",&arr[i]);

    }

    for (i = 1; i < n; i++)

        if (arr[i] < arr[l])

        l = i;

    printf("The minimum is %d.\n", arr[l]);

    return 0;

}

/\*\*

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Q3.Write a program that will input n numbers and display the minimum and maximum.

\*\*/

#include<stdio.h>

int main()

{

    int arr[100];

    int i, max, min, n;

    printf("Enter size of the array: \n");

    scanf("%d", &n);

    printf("Enter elements in the array: \n");

    for(i=0; i<n; i++)

    {

        scanf("%d", &arr[i]);

    }

    // Assume first element as maximum and minimum

    max = arr[0];

    min = arr[0];

    for(i=1; i<n; i++)

    {

        // If current element is greater than max

        if(arr[i] > max)

        {

            max = arr[i];

        }

        // If current element is smaller than min

        if(arr[i] < min)

        {

            min = arr[i];

        }

    }

    printf("Maximum element = %d\n", max);

    printf("Minimum element = %d\n", min);

    return 0;

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q4.Write a program that will input n numbers, calculate the sum of all even numbers and all

odd numbers in the array and print the larger sum.

\*\*/

#include<stdio.h>

int main()

{

    int n, i, a[10];

    int Even\_Sum = 0, Odd\_Sum = 0, max;

    printf("Enter the Size of an Array : \n");

    scanf("%d", &n);

    printf("Enter the Array Elements\n");

    for (i = 0; i < n; i++)

    {

        scanf("%d", &a[i]);

    }

    // taking initially maxmimum element is the initial value of array

    max = a[0];

    for (i = 0; i < n; i++)

    {

        // checking maximum element

        if (a[i] > max)

        {

            max = a[i];

        }

        // Checking even and odd eleemts and keep sum of those

        if (a[i] % 2 == 0)

        {

            Even\_Sum = Even\_Sum + a[i];

        }

        else

        {

            Odd\_Sum = Odd\_Sum + a[i];

        }

    }

    printf("The Sum of Even Numbers in this Array = %d \n", Even\_Sum);

    printf("The Sum of Odd Numbers in this Array = %d \n", Odd\_Sum);

    printf("The maximum number is : %d\n", max);

    return 0;

}

/\*\*

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Q5.Write a program to input n elements into an array and then copy the elements to another

array after adding 1 to each of the elements.

\*\*/

#include <stdio.h>

int main()

{

    int a[10], b[10], i, n;

    char c;

    printf("Enter the number of element you want to enter in array 1:\n");

    scanf("%d", &n);

    printf("Enter the elements:\n");

    for (i = 0; i < n; i++)

    {

        scanf("%d", &a[i]);

    }

    for (i = 0; i < n; i++)

    {

        b[i] = a[i] + 1;

    }

    printf("The array 2 is: {");

    for (i = 0; i < n; i++)

    {

        printf("%d,", b[i]);

    }

    printf("}\n");

    return 0;

}

/\*\*

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Q6.Write a program to input an array of n elements and apply linear search algorithm to

search an element. Print the position of the element if it is found, otherwise display the

message the element not found.

\*\*/

#include<stdio.h>

int main()

{

    int a[100],i,n,key;

    printf("Enter size of the array : \n");

    scanf("%d",&n);

    printf("Enter Elements in array : \n");

    for ( i = 0; i < n; i++)

    {

        scanf("%d",&a[i]);

    }

    printf("Enter the element that to search! : \n");

    scanf("%d",&key);

    for ( i = 0; i < n; i++)

    {

        // Checking wheather the inputed number is in array or not

        if (a[i]==key)

        {

            printf("Element found at index %d\n",i);

        }

    }

    if (i=n)

    {

        printf("The element is not found\n");

    }

    return 0;

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q7. Write a program to input an array of n elements and apply binary search algorithm to

search an element. Print the position of the element if it is found, otherwise display the

message the element not found.

\*\*/

#include <stdio.h>

int main()

{

    int a[100], i, n, key, low, high, mid;

    printf("Enter size of the array : \n");

    scanf("%d", &n);

    printf("Enter Elements in array : \n");

    for (i = 0; i < n; i++)

    {

        scanf("%d", &a[i]);

    }

    printf("Enter the element that to search! : \n");

    scanf("%d", &key);

    low = 0;

    high = n - 1;

    while (low <= high)

    {

        // Checking wheather the inputed number is in array or not

        mid = (low + high) / 2;

        if (a[mid] < key)

        {

            low = mid + 1;

        }

        else if (a[mid] > key)

        {

            high = mid - 1;

            mid = (low + high) / 2;

        }

        else

        {

            printf("The key is found at index %d\n", mid);

            break;

        }

    }

    if (i=n)

    {

        printf("The element is not found\n");

    }

    return 0;

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q8.Write a program to insert an element at a certain position in an array of n numbers after

taking suitable user inputs.

\*\*/

#include<stdio.h>

int main()

{

    int a[100], i, n, key, pos;

    printf("Enter the number of elements in array : \n");

    scanf("%d", &n);

    printf("Enter Elements in array : \n");

    for (i = 0; i < n; i++)

    {

        scanf("%d", &a[i]);

    }

    printf("Enter the element that to insert! and \nthe index where u want to insert that element: \n");

    scanf("%d%d",&key,&pos);

    i=n-1;

    while(i>=pos)

    {

        a[i+1]=a[i];

        i--;

    }

    a[pos]=key;

    n++;

    printf("Successfully Inserted!\nNow the array become {");

    for (i = 0; i < n; i++)

    {

        printf("%d,",a[i]);

    }

    printf("}\n");

    return 0;

}

/\*\*

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Q9.Write a program to delete an element from a certain position in an array of n numbers

after taking suitable user inputs.

\*\*/

#include<stdio.h>

int main()

{

    int a[100], i, n, key, pos;

    printf("Enter the number of elements in array : \n");

    scanf("%d", &n);

    printf("Enter Elements in array : \n");

    for (i = 0; i < n; i++)

    {

        scanf("%d", &a[i]);

    }

    printf("Enter the element that to delete! and \nthe index where the eleemnt is present: \n");

    scanf("%d%d",&key,&pos);

    key=a[pos];

    i=pos;

    while(i<=n-1)

    {

        a[i]=a[i+1];

        i++;

    }

    n--;

    printf("Successfully Deleted!\nNow the array become {");

    for (i = 0; i < n; i++)

    {

        printf("%d,",a[i]);

    }

    printf("}\n");

    return 0;

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q10.Write a program that will sort a list of numbers in ascending order by using Selection sort

algorithm

\*\*/

#include <stdio.h>

int main()

{

    int a[10], n, i, j, min, temp;

    printf("Enter the number of elements in array : \n");

    scanf("%d", &n);

    printf("Enter Elements in array : \n");

    for (i = 0; i < n; i++)

    {

        scanf("%d", &a[i]);

    }

    j = 0;

    while (j < n - 1)

    {

        min = j;

        i = j + 1;

        while (i < n)

        {

            if (a[i] < a[min])

            {

                min = i;

            }

            i++;

        }

        if (min != j)

        {

            temp = a[j];

            a[j] = a[min];

            a[min] = temp;

        }

        j++;

    }

    printf("After Sorting the array according to the ascending order\nNow the array become : {");

    for (i = 0; i < n; i++)

    {

        printf("%d,", a[i]);

    }

    printf("}");

    return 0;

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q11.Write a program that will read a 2D array and display it in matrix format.

\*\*/

#include <stdio.h>

void main()

{

    int arr[10][10], i, j, nr, nc;

    printf("Enter number of rows and column:\n");

    scanf("%d%d", &nr, &nc);

    printf("Input elements in the matrix :\n");

    for (i = 0; i < nr; i++)

    {

        for (j = 0; j < nc; j++)

        {

            printf("element - [%d],[%d] : ", i, j);

            scanf("%d", &arr[i][j]);

        }

    }

    printf("\nThe matrix is : \n");

    for (i = 0; i < nr; i++)

    {

        for (j = 0; j < nc; j++)

        {

            printf("%d\t", arr[i][j]);

        }

        printf("\n");

    }

    printf("\n\n");

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q12.Write a program to input two matrices and do the matrix addition after checking suitable

condition.

\*\*/

#include <stdio.h>

int main()

{

    int nr1, nr2, nc1, nc2, i, j, first[10][10], second[10][10], sum[10][10];

    printf("Enter the number of rows and columns of matrix 1:\n");

    scanf("%d%d", &nr1, &nc1);

    printf("Enter the number of rows and columns of matrix 2:\n");

    scanf("%d%d", &nr2, &nc2);

    if (nr1 != nr2 || nc1 != nc2)

    {

        printf("The Matrix addition is not possible !\nEnter valid input!!\n");

    }

    else

    {

        printf("Enter the elements of first matrix\n");

        for (i = 0; i < nr1; i++)

        {

            for (j = 0; j < nc1; j++)

            {

                printf("element - [%d],[%d] : ", i, j);

                scanf("%d", &first[i][j]);

            }

        }

        printf("Enter the elements of second matrix\n");

        for (i = 0; i < nr2; i++)

        {

            for (j = 0; j < nc2; j++)

            {

                printf("element - [%d],[%d] : ", i, j);

                scanf("%d", &second[i][j]);

            }

        }

        printf("Sum of entered matrices:-\n");

        for (i = 0; i < nr1; i++)

        {

            for (j = 0; j < nc1; j++)

            {

                sum[i][j] = first[i][j] + second[i][j];

                printf("%d\t", sum[i][j]);

            }

            printf("\n");

        }

    }

    return 0;

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q13.Write a program to input two matrices and do the matrix multiplication after checking

suitable condition.

\*\*/

#include <stdio.h>

int main()

{

    int m1, m2, n1, n2, i, j, k, first[10][10], second[10][10], multiply[10][10];

    printf("Enter the number of rows and columns of matrix 1:\n");

    scanf("%d%d", &m1, &n1);

    printf("Enter the number of rows and columns of matrix 2:\n");

    scanf("%d%d", &m2, &n2);

    if (n1 != m2)

    {

        printf("The Matrix multiplication is not possible !\nEnter valid input!!\n");

    }

    else

    {

        printf("Enter the elements of first matrix\n");

        for (i = 0; i < m1; i++)

        {

            for (j = 0; j < n1; j++)

            {

                printf("element - [%d],[%d] : ", i, j);

                scanf("%d", &first[i][j]);

            }

        }

        printf("Enter the elements of second matrix\n");

        for (i = 0; i < m2; i++)

        {

            for (j = 0; j < n2; j++)

            {

                printf("element - [%d],[%d] : ", i, j);

                scanf("%d", &second[i][j]);

            }

        }

        for (i = 0; i < m1; i++)

        {

            for (j = 0; j < n1; j++)

            {

                multiply[i][j] = 0;

                for (k = 0; k < m2; k++)

                {

                    multiply[i][j] = multiply[i][j] + first[i][k] \* second[k][j];

                }

            }

        }

        printf("Multiplication of entered matrices:-\n");

        for (i = 0; i < m1; i++)

        {

            for (j = 0; j < n2; j++)

                printf("%d\t", multiply[i][j]);

            printf("\n");

        }

    }

    return 0;

}

/\*\*

Name- PRIYANSHU MALLICK, Roll No- 13

Q14.Write a program to input a matrix and transpose it.

\*\*/

#include <stdio.h>

int main()

{

    int arr[20][20], tr[20][20], i, j, m, n;

    printf("\nEnter the Number of Rows and Coloumns : \n");

    scanf("%d%d", &m, &n);

    for (i = 0; i < m; i++)

    {

        for (j = 0; j < n; j++)

        {

            printf("element - [%d],[%d] : ", i, j);

            scanf("%d", &arr[i][j]);

            tr[j][i] = arr[i][j];

        }

    }

    printf("The transpose of entered matrix is: \n");

    for (i = 0; i < n; i++)

    {

        printf("\n");

        for (j = 0; j < m; j++)

        {

            printf(" %d ", tr[i][j]);

        }

    }

    return 0;

}