

```

##### BUBBLESORT #####
#include <stdio.h>

int main(){
    int arr[50], num, x, y, temp;

    printf("Please Enter the Number of Elements you want in the array: ");
    scanf("%d", &num);
    printf("Please Enter the Value of Elements: ");
    for(x = 0; x < num; x++){
        scanf("%d", &arr[x]);
    }
    for(x = 0; x < num - 1; x++){
        for(y = 0; y < num - x - 1; y++){
            if(arr[y] > arr[y + 1]){
                temp = arr[y];
                arr[y] = arr[y + 1];
                arr[y + 1] = temp;
            }
        }
    }
    printf("Array after implementing bubble sort: ");
    for(x = 0; x < num; x++){
        printf("%d ", arr[x]);
    }
    return 0;
}

```

Problems on Strings

1. Write a program to shift the elements of a single dimensional array in the right direction by one position.
If the given array is [76 35 43 22] then after execution, the program should be [22 76 35 43]
2. Write a program to calculate sum of list by passing an array to a function.

Solution Program 1:

```
#include <stdio.h>

int main() {
    int arr[] = {76, 35, 43, 22};
    int size = sizeof(arr) / sizeof(arr[0]);
    int lastElement;

    // Print the input array
    printf("Input Array: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", arr[i]);
    }

    // Store the last element
    lastElement = arr[size - 1];

    // Shift elements to the right
    for (int i = size - 1; i > 0; i--) {
        arr[i] = arr[i - 1];
    }

    // Place the last element in the first position
    arr[0] = lastElement;

    // Print the shifted array
    printf("\nShifted Array: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", arr[i]);
    }

    return 0;
}
```

Solution Program 2:

```
#include <stdio.h>

// Function to calculate the sum of an array
int calculateSum(int arr[], int size) {
    int sum = 0;
    for (int i = 0; i < size; i++) {
        sum += arr[i]; // Add each element to the sum
    }
    return sum; // Return the calculated sum
}

int main() {
    int size;

    // Input the size of the array
    printf("Enter the number of elements: ");
    scanf("%d", &size);

    int arr[size]; // Declare the array

    // Input the elements of the array
    printf("Enter %d elements:\n", size);
    for (int i = 0; i < size; i++) {
        scanf("%d", &arr[i]);
    }

    // Call the function to calculate the sum
    int sum = calculateSum(arr, size);

    // Display the result
    printf("The sum of the array elements is: %d\n", sum);

    return 0;
}
```

Programs on Multidimensional Arrays

```
-----  
-----PROGRAM 1-----  
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```

```
// C program to store temperature of two cities of a week and display it.  
#include <stdio.h>  
const int CITY = 2;  
const int WEEK = 7;  
int main()  
{  
    int temperature[CITY][WEEK];  
    // Using nested loop to store values in a 2d array  
    for (int i = 0; i < CITY; ++i)  
    {  
        for (int j = 0; j < WEEK; ++j)  
        {  
            printf("City %d, Day %d: ", i + 1, j + 1);  
            scanf("%d", &temperature[i][j]);  
        }  
    }  
    printf("\nDisplaying values: \n\n");  
    // Using nested loop to display values of a 2d array  
    for (int i = 0; i < CITY; ++i)  
    {  
        for (int j = 0; j < WEEK; ++j)  
        {  
            printf("City %d, Day %d = %d\n", i + 1, j + 1, temperature[i][j]);  
        }  
    }  
    return 0;  
}
```

```
-----  
-----PROGRAM 2 Sum of two matrices-----  
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```

```
// C program to find the sum of two matrices of order 2*2  
  
#include <stdio.h>  
int main()  
{  
    float a[2][2], b[2][2], result[2][2];  
  
    // Taking input using nested for loop  
    printf("Enter elements of 1st matrix\n");  
    for (int i = 0; i < 2; ++i)  
    for (int j = 0; j < 2; ++j)  
    {  
        printf("Enter a%d%d: ", i + 1, j + 1);  
        scanf("%f", &a[i][j]);  
    }  
  
    // Taking input using nested for loop  
    printf("Enter elements of 2nd matrix\n");  
    for (int i = 0; i < 2; ++i)  
    for (int j = 0; j < 2; ++j)
```

```
{
printf("Enter b%d%d: ", i + 1, j + 1);
scanf("%f", &b[i][j]);
}

// adding corresponding elements of two arrays
for (int i = 0; i < 2; ++i)
for (int j = 0; j < 2; ++j)
{
result[i][j] = a[i][j] + b[i][j];
}

// Displaying the sum
printf("\nSum Of Matrix:");
for (int i = 0; i < 2; ++i)
for (int j = 0; j < 2; ++j)
{
printf("%.1ft", result[i][j]);
if (j == 1)
printf("\n");
}
return 0;
}
```

```

#include <stdio.h>

int main() {
    int a[10][10], b[10][10], mul[10][10] = {0};
    int r, c, i, j, k;

    // Input dimensions
    printf("Enter the number of rows and columns: ");
    scanf("%d %d", &r, &c);

    // Input first matrix
    printf("Enter elements of the first matrix:\n");
    for (i = 0; i < r; i++) {
        for (j = 0; j < c; j++) {
            scanf("%d", &a[i][j]);
        }
    }

    // Input second matrix
    printf("Enter elements of the second matrix:\n");
    for (i = 0; i < r; i++) {
        for (j = 0; j < c; j++) {
            scanf("%d", &b[i][j]);
        }
    }

    // Multiply matrices
    for (i = 0; i < r; i++) {
        for (j = 0; j < c; j++) {
            for (k = 0; k < c; k++) {
                mul[i][j] += a[i][k] * b[k][j];
            }
        }
    }

    // Print the result
    printf("Resultant Matrix:\n");
    for (i = 0; i < r; i++) {
        for (j = 0; j < c; j++) {
            printf("%d\t", mul[i][j]);
        }
        printf("\n");
    }

    return 0;
}

```

C program to perform Matrix Multiplication using Function

```
#include <stdio.h>
// function to multiply two square matrix
void multiplyMatrix(int a[10][10], int b[10][10],
    int c[10][10], int size)
{
    for(int i=0; i<size; i++)
    {
        for(int j=0; j<size; j++)
        {
            // assign 0
            c[i][j] = 0;
            for (int k = 0; k < size; k++)
            {
                // find product
                c[i][j] += a[i][k] * b[k][j];
            }
        }
    }
}
// function to read square matrix
void readMatrix(int matrix[10][10], int size)
{
    for (int i = 0; i < size; i++)
    {
        for (int j = 0; j < size; j++)
        {
            scanf("%d", &matrix[i][j]);
        }
    }
}
// function to display square matrix
void displayMatrix(int matrix[10][10], int size)
{
    for (int i = 0; i < size; ++i)
    {
        for (int j = 0; j < size; ++j)
        {
            printf("%d ", matrix[i][j]);
        }
        printf("\n"); // new line
    }
}
// main function
int main()
{
    // declare matrix matrix A, B, & C
    int a[10][10]; // first matrix
    int b[10][10]; // second matrix
    int c[10][10]; // resultant matrix

    // read the size of matrices
    int size;
    printf("Enter Order of Both Matrix,\n");
    printf("Enter 2 for 2x2, 3 for 3x3 and e.t.c.: ");
    scanf("%d", &size);

    // read matrix A and B
```

```
printf("Enter Matrix-1 Elements: \n");
readMatrix(a, size);
printf("Enter Matrix-2 Elements: \n");
readMatrix(b, size);

// multiply both matrix A and B
multiplyMatrix(a, b, c, size);

// display resultant matrix
printf("Resultant Matrix: \n");
displayMatrix(c, size);

return 0;
}
```


