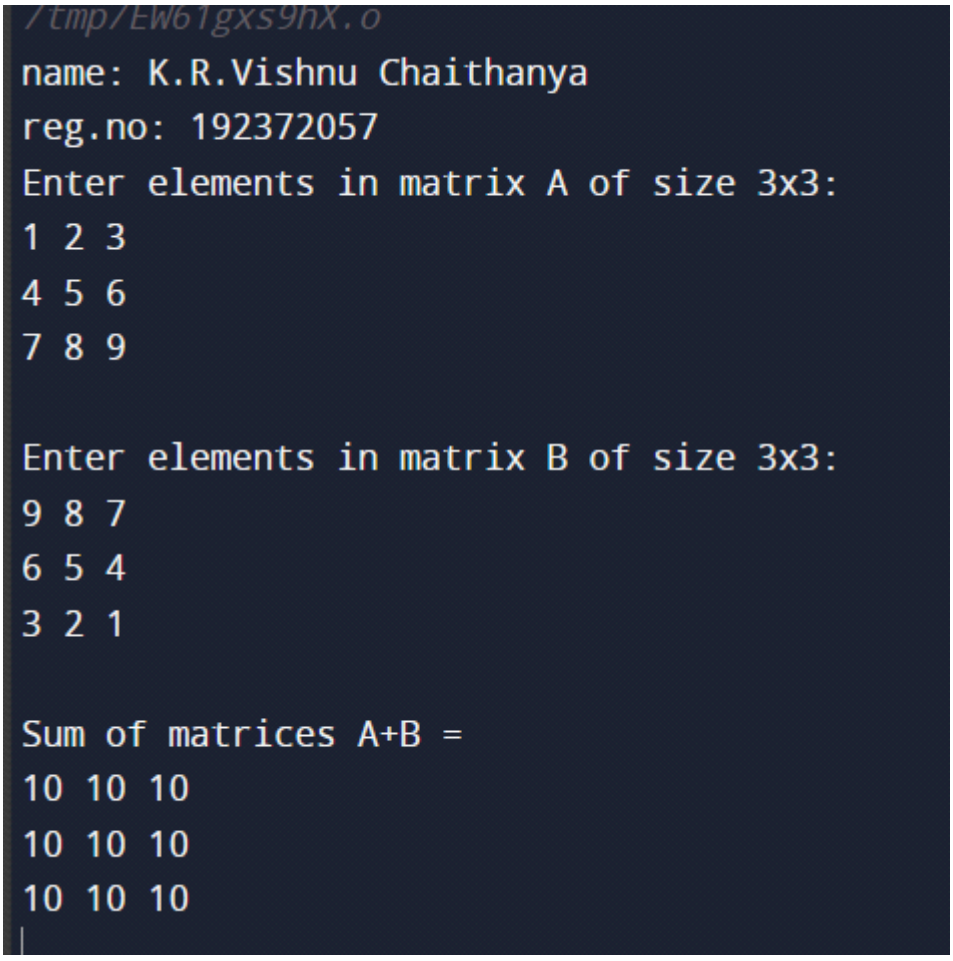
03 March 2024 14:59

Addition of two matrices

```
#include <stdio.h>
#define SIZE 3
int main()
{
   int A[SIZE][SIZE];
   int B[SIZE][SIZE];
   int C[SIZE][SIZE];
   int row, col;
   printf("name: K.R.Vishnu Chaithanya\n");
   printf("reg.no: 192372057\n");
   printf("Enter elements in matrix A of size 3x3: \n");
   for(row=0; row<SIZE; row++)
   {
      for(col=0; col<SIZE; col++)
      {
         scanf("%d", &A[row][col]);
      }
   }
   printf("\nEnter elements in matrix B of size 3x3: \n");
   for(row=0; row<SIZE; row++)
   {
      for(col=0; col<SIZE; col++)
      {
         scanf("%d", &B[row][col]);
      }
   }
    for(row=0; row<SIZE; row++)
   {
      for(col=0; col<SIZE; col++)
      {
         C[row][col] = A[row][col] + B[row][col];
      }
   }

   printf("\nSum of matrices A+B = \n");
   for(row=0; row<SIZE; row++)
   {
      for(col=0; col<SIZE; col++)
      {
         printf("%d ", C[row][col]);
      }
      printf("\n");
   }

   return 0;
}
```



Multiplication of two matrices

```
#include <stdio.h>
#define SIZE 3
int main()
{
   int A[SIZE][SIZE];
   int B[SIZE][SIZE];
   int C[SIZE][SIZE];
   int row, col, i, sum;
   printf("name:K.R.Vishnu Chaithanya\n");
   printf("reg no:192372057\n");
   printf("Enter elements in matrix A of size %dx%d: \n", SIZE, SIZE);
   for(row=0; row<SIZE; row++)
   {
      for(col=0; col<SIZE; col++)
      {
         scanf("%d", &A[row][col]);
      }
   }
   printf("\nEnter elements in matrix B of size %dx%d: \n", SIZE, SIZE);
   for(row=0; row<SIZE; row++)
   {
      for(col=0; col<SIZE; col++)
      {
```

```
            scanf("%d", &B[row][col]);
        }
    }
    for(row=0; row<SIZE; row++)
    {
        for(col=0; col<SIZE; col++)
        {
            sum = 0;
                    for(i=0; i<SIZE; i++)
            {
                sum += A[row][i] * B[i][col];
            }

            C[row][col] = sum;
        }
    }
    printf("\nProduct of matrix A * B = \n");
    for(row=0; row<SIZE; row++)
    {
        for(col=0; col<SIZE; col++)
        {
            printf("%d ", C[row][col]);
        }
        printf("\n");
    }
    return 0;
}
```

```
name:K.R.Vishnu Chaithanya
reg no:192372057
Enter elements in matrix A of size 3x3:
1 2 3
4 5 6
7 8 9

Enter elements in matrix B of size 3x3:
9 8 7
6 5 4
3 2 1

Product of matrix A * B =
30 24 18
84 69 54
138 114 90
```

Transpose of matrix

```c
#include <stdio.h>
#define MAX_ROWS 3
#define MAX_COLS 3
int main()
{
   int A[MAX_ROWS][MAX_COLS];
   int B[MAX_COLS][MAX_ROWS];
   int row, col;
   printf("name:K.R.Vishnu Chaithanya\n");
   printf("reg no.:192372057\n");
   printf("Enter elements in matrix of size %dx%d: \n", MAX_ROWS, MAX_COLS);
   for(row=0; row<MAX_ROWS; row++)
   {
      for(col=0; col<MAX_COLS; col++)
      {
         scanf("%d", &A[row][col]);
      }
   }
   for(row=0; row<MAX_ROWS; row++)
   {
      for(col=0; col<MAX_COLS; col++)
      {
         B[col][row] = A[row][col];
      }
   }
   printf("\nOriginal matrix: \n");
   for(row=0; row<MAX_ROWS; row++)
   {
      for(col=0; col<MAX_COLS; col++)
      {
         printf("%d ", A[row][col]);
      }

      printf("\n");
   }
   printf("Transpose of matrix A: \n");
   for(row=0; row<MAX_COLS; row++)
   {
      for(col=0; col<MAX_ROWS; col++)
      {
         printf("%d ", B[row][col]);
      }
      printf("\n");
   }
   return 0;
}
```

```
name:K.R.Vishnu Chaithanya
reg no.:192372057
Enter elements in matrix of size 3x3:
1 2 3
4 5 6
7 8 9

Original matrix:
1 2 3
4 5 6
7 8 9
Transpose of matrix A:
1 4 7
2 5 8
3 6 9
```

Insert an element in an array

```
#include <stdio.h>
#define MAX_SIZE 100
int main()
{
   int arr[MAX_SIZE];
   int i, size, num, pos;
   printf("name:K.R.Vishnu Chaithanya\n");
   printf("reg no.:192372057\n");
   printf("Enter size of the array : ");
   scanf("%d", &size);
   printf("Enter elements in array : ");
   for(i=0; i<size; i++)
   {
      scanf("%d", &arr[i]);
   }
   printf("Enter element to insert : ");
   scanf("%d", &num);
   printf("Enter the element position : ");
   scanf("%d", &pos);
   if(pos > size+1 || pos <= 0)
   {
      printf("Invalid position! Please enter position between 1 to %d", size);
   }
   else
   {
      for(i=size; i>=pos; i--)
      {
         arr[i] = arr[i-1];
      }
```

```
    arr[pos-1] = num;
    size++;
    printf("Array elements after insertion : ");
    for(i=0; i<size; i++)
    {
       printf("%d\t", arr[i]);
    }
  }
  return 0;
}
```

```
/tmp/EW6fgXs9hX.o
name:K.R.Vishnu Chaithanya
reg no.:192372057
Enter size of the array : 5
Enter elements in array : 1 2 3 4 5
Enter element to insert : 7
Enter the element position : 3
Array elements after insertion : 1  2  7  3  4  5
```

Deletion of an element in an array

```
#include <stdio.h>
#define MAX_SIZE 100
int main()
{
  int arr[MAX_SIZE];
  int i, size, pos;
  printf("name: K.R.Vishnu Chaithanya\n");
  printf("reg no.:192372057\n");
  printf("Enter size of the array : ");
  scanf("%d", &size);
  printf("Enter elements in array : ");
  for(i=0; i<size; i++)
  {
    scanf("%d", &arr[i]);
  }
  printf("Enter the element position to delete : ");
  scanf("%d", &pos);
  if(pos < 0 || pos > size)
  {
    printf("Invalid position! Please enter position between 1 to %d", size);
  }
  else
  {
    for(i=pos-1; i<size-1; i++)
    {
      arr[i] = arr[i + 1];
    }
    size--;
    printf("\nElements of array after delete are : ");
    for(i=0; i<size; i++)
```

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

```
name: K.R.Vishnu Chaithanya
reg no.:192372057
Enter size of the array : 5
Enter elements in array : 7 9 4 6 2
Enter the element position to delete : 4

Elements of array after delete are : 7  9  4  2
```

Sum of diagonals

```
#include <stdio.h>

int main() {
    int rows, cols, sum = 0;
    printf("name:K.R.Vishnu Chaithanya\n");
    printf("reg.no.:192372057\n");
    printf("Enter the number of rows and columns of the square matrix: ");
    scanf("%d", &rows);

    int matrix[rows][rows];

    printf("Enter the elements of the matrix:\n");
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < rows; j++) {
            scanf("%d", &matrix[i][j]);
            if (i == j) {
                sum += matrix[i][j];
            }
        }
    }

    printf("The sum of diagonal elements of the matrix is: %d\n", sum);

    return 0;
```

```
name:K.R.Vishnu Chaithanya
reg.no.:192372057
Enter the number of rows and columns of the square matrix: 3
Enter the elements of the matrix:
1 2 3
4 5 6
7 8 9
The sum of diagonal elements of the matrix is: 15
```

```
}
```

Merging of two arrays

```
#include <stdio.h>

int main() {
   int size1, size2, size_merged;
printf("name:K.R.Vishnu Chaithanya\n");
printf("reg no.192372057\n");
   printf("Enter the size of the first array: ");
   scanf("%d", &size1);

   int arr1[size1];

   printf("Enter elements of the first array:\n");
   for (int i = 0; i < size1; i++) {
      scanf("%d", &arr1[i]);
   }

   printf("Enter the size of the second array: ");
   scanf("%d", &size2);

   int arr2[size2];

   printf("Enter elements of the second array:\n");
   for (int i = 0; i < size2; i++) {
      scanf("%d", &arr2[i]);
   }

   size_merged = size1 + size2;
   int merged[size_merged];

   for (int i = 0; i < size1; i++) {
      merged[i] = arr1[i];
   }

   for (int i = 0; i < size2; i++) {
      merged[size1 + i] = arr2[i];
   }

   printf("Merged Array:\n");
   for (int i = 0; i < size_merged; i++) {
      printf("%d ", merged[i]);
   }

   return 0;
}
```

```
name:K.R.Vishnu Chaithanya
reg no.192372057
Enter the size of the first array: 5
Enter elements of the first array:
1 2 3 4 5
Enter the size of the second array: 5
Enter elements of the second array:
1 2 3 4 5
Merged Array:
1 2 3 4 5 1 2 3 4 5
```

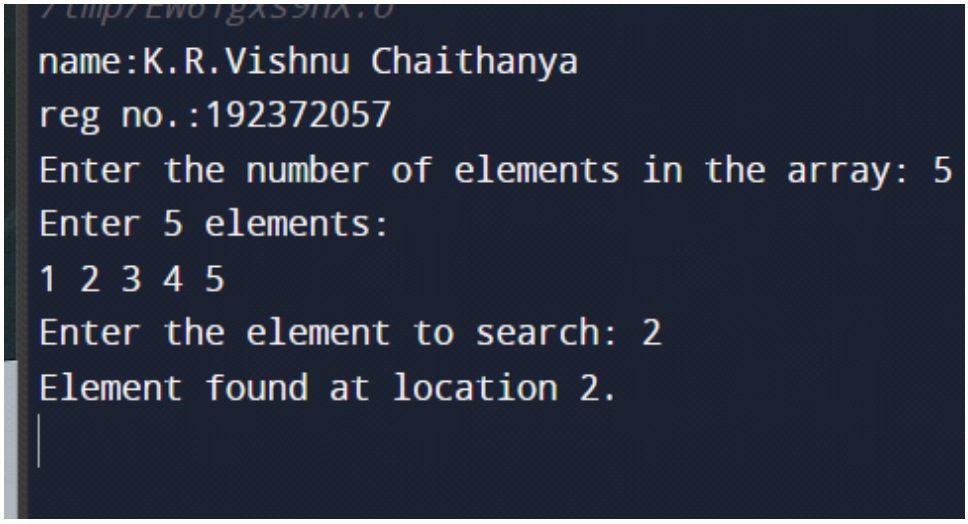
No. of Duplicate elements

```
#include <stdio.h>
#define MAX_SIZE 100
int main()
{
   int arr[MAX_SIZE];
   int i, j, size, count = 0;
   printf("name:K.R.Vishnu Chaithanya\n");
   printf("reg no.:192372057\n");
   printf("Enter size of the array : ");
   scanf("%d", &size);
   printf("Enter elements in array : ");
   for(i=0; i<size; i++)
   {
      scanf("%d", &arr[i]);
   }
   for(i=0; i<size; i++)
   {
      for(j=i+1; j<size; j++)
      {
         if(arr[i] == arr[j])
         {
            count++;
            break;
         }
      }
   }

   printf("\nTotal number of duplicate elements found in array = %d", count);

   return 0;
}
```

```
name:K.R.Vishnu Chaithanya
reg no.:192372057
Enter size of the array : 5
Enter elements in array : 1 2 3 3 3

Total number of duplicate elements found in array = 2
```

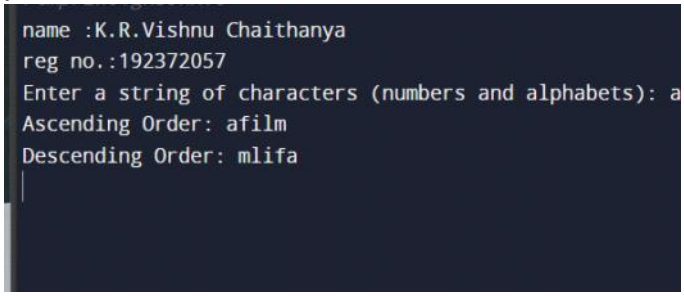
Location of an element in an array

```
#include <stdio.h>

int main() {
   int arr[100], n, i, search, flag = 0;
printf("name:K.R.Vishnu Chaithanya\n");
printf("reg no.:192372057\n");
   printf("Enter the number of elements in the array: ");
   scanf("%d", &n);

   printf("Enter %d elements:\n", n);
   for (i = 0; i < n; i++) {
      scanf("%d", &arr[i]);
   }

   printf("Enter the element to search: ");
   scanf("%d", &search);

   for (i = 0; i < n; i++) {
      if (arr[i] == search) {
         printf("Element found at location %d.\n", i + 1);
         flag = 1;
         break;
      }
   }

   if (flag == 0) {
      printf("Element not found in the array.\n");
   }

   return 0;
}
```



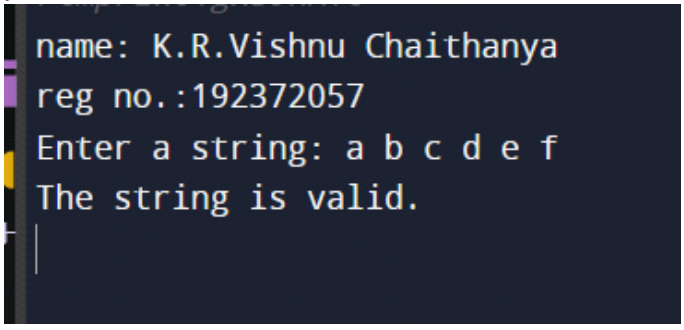
Ascending and descending order

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int cmp_asc(const void *a, const void *b) {
   return (*(char*)a - *(char*)b);
}
int cmp_desc(const void *a, const void *b) {
   return (*(char*)b - *(char*)a);
}
int main() {
   printf("name :K.R.Vishnu Chaithanya\n");
   printf("reg no.:192372057\n");
   char str[100];
   printf("Enter a string of characters (numbers and
alphabets): ");
   scanf("%s", str);
   int len = strlen(str);
   qsort(str, len, sizeof(char), cmp_asc);
   printf("Ascending Order: %s\n", str);
   qsort(str, len, sizeof(char), cmp_desc);
   printf("Descending Order: %s\n", str);
return 0;
}
```



Validation of a string

```
#include <stdio.h>

int main() {
   char str[100];
   int isValid = 1;
   int i = 0;
printf("name: K.R.Vishnu Chaithanya\n");
printf("reg no.:192372057\n");
   printf("Enter a string: ");
   scanf("%s", str);

   while (str[i] != '\0') {
      if (!((str[i] >= 'a' && str[i] <= 'z') || (str[i] >= 'A' &&
str[i] <= 'Z'))) {
         isValid = 0;
         break;
      }
      i++;
   }

   if (isValid)
      printf("The string is valid.\n");
   else
      printf("The string is not valid.\n");

   return 0;
}
```



Largest element in an array

```
#include <stdio.h>
#define MAX_SIZE 100
int main()
{
   int arr[MAX_SIZE];
   int i, max, min, size;
   printf("name:K.R.Vishnu Chaithanya\n");
   printf("reg no.192372057\n");
```

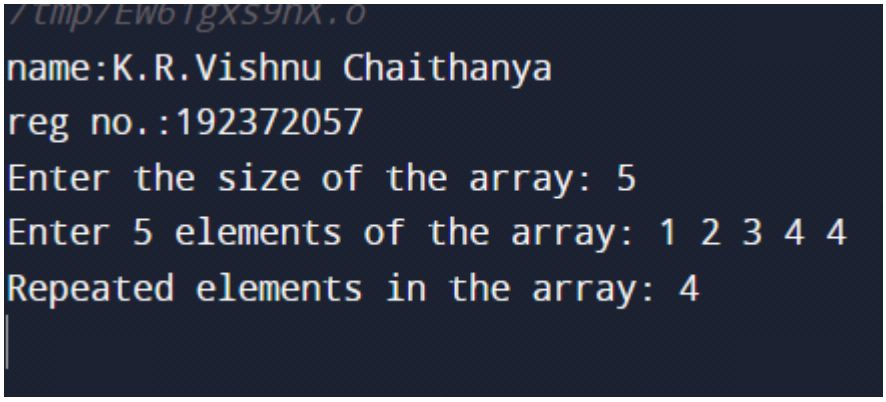
```
    printf("Enter size of the array: ");
    scanf("%d", &size);
    printf("Enter elements in the array: ");
    for(i=0; i<size; i++)
    {
       scanf("%d", &arr[i]);
    }
    max = arr[0];
    min = arr[0];
    for(i=1; i<size; i++)
    {
       if(arr[i] > max)
       {
          max = arr[i];
       }
       if(arr[i] < min)
       {
          min = arr[i];
       }
    }
    printf("Maximum element = %d\n", max);
    return 0;
}
```

```
name:K.R.Vishnu Chaithanya
reg no.192372057
Enter size of the array: 5
Enter elements in the array: 1 2 3 4 5
Maximum element = 5
```

Repeated elements

```
#include <stdio.h>

int main() {
   int arr[100], n;
   printf("name:K.R.Vishnu Chaithanya\n");
   printf("reg no.:192372057\n");
   printf("Enter the size of the array: ");
   scanf("%d", &n);
   printf("Enter %d elements of the array: ", n);
   for (int i = 0; i < n; i++) {
      scanf("%d", &arr[i]);
   }
   printf("Repeated elements in the array: ");
```

```
        for (int i = 0; i < n; i++) {
            for (int j = i + 1; j < n; j++) {
                if (arr[i] == arr[j]) {
                    printf("%d ", arr[i]);
                    break;
                }
            }
        }
        printf("\n");
        return 0;
    }
```



Even and odd

```
#include <stdio.h>

int main() {
    int n;
printf("name:K.R.Vishnu Chaithanya\n");
printf("reg no.192372057\n");
    printf("Enter the size of the array: ");
    scanf("%d", &n);

    int arr[n];

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

    printf("Even elements: ");
    for (int i = 0; i < n; i++) {
        if (arr[i] % 2 == 0) {
            printf("%d ", arr[i]);
        }
    }
    printf("\n");

    printf("Odd elements: ");
    for (int i = 0; i < n; i++) {
```

```
            if (arr[i] % 2 != 0) {
                printf("%d ", arr[i]);
            }
        }
        printf("\n");

        return 0;
```

```
name:K.R.Vishnu Chaithanya
reg no.192372057
Enter the size of the array: 5
Enter 5 elements:
1 2 3 4 5
Even elements: 2 4
Odd elements: 1 3 5
```

Addition of rows and coloumns

```
#include <stdio.h>

#define MAX_ROWS 100
#define MAX_COLS 100

int main() {
   int matrix[MAX_ROWS][MAX_COLS];
   int rows, cols;
   printf("name:K.R.Vishnu Chaithanya\n");
printf("reg no.192372057\n");

   printf("Enter the number of rows and columns of the matrix:
");
   scanf("%d %d", &rows, &cols);

   printf("Enter the elements of the matrix:\n");
   for (int i = 0; i < rows; i++) {
      for (int j = 0; j < cols; j++) {
         scanf("%d", &matrix[i][j]);
      }
   }

   printf("The matrix is:\n");
   for (int i = 0; i < rows; i++) {
      for (int j = 0; j < cols; j++) {
         printf("%d ", matrix[i][j]);
      }
      printf("\n");
   }
```

```
    printf("Sum of elements in each row:\n");
    for (int i = 0; i < rows; i++) {
        int rowSum = 0;
        for (int j = 0; j < cols; j++) {
            rowSum += matrix[i][j];
        }
        printf("Row %d: %d\n", i+1, rowSum);
    }

    printf("Sum of elements in each column:\n");
    for (int j = 0; j < cols; j++) {
        int colSum = 0;
        for (int i = 0; i < rows; i++) {
            colSum += matrix[i][j];
        }
        printf("Column %d: %d\n", j+1, colSum);
    }

    return 0;
}
```

```
/tmp/EW61gxs9hX.o
name:K.R.Vishnu Chaithanya
reg no.192372057
Enter the number of rows and columns of the matrix: 3
3
Enter the elements of the matrix:
1 2 3
4 5 6
7 8 9
The matrix is:
1 2 3
4 5 6
7 8 9
Sum of elements in each row:
Row 1: 6
Row 2: 15
Row 3: 24
Sum of elements in each column:
Column 1: 12
Column 2: 15
Column 3: 18
```

5th ITERATED ELEMENT

```
#include <stdio.h>

int main() {
    int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    int size = sizeof(arr) / sizeof(arr[0]);
    int i;
    printf("name:K.R.Vishnu Chaithanya\n");
printf("reg no.192372057\n");
```

```
    printf("5th Iterated elements in the array: ");
    for (i = 4; i < size; i += 5) {
        printf("%d ", arr[i]);
    }
    printf("\n");

    return 0;
}
```