

DSA

INTERNSHALA

Single & Double Dimension Arrays

Introduction to Structure of C Programs

What are functions?

A function is a subprogram that performs logically isolated task. It means in a group of functions, statements of each function will be having a different kind of logic. All these functions put together constitute one single program. So we can say that a program or a software is a bundle of many functions.

Basically there are two types of functions-

- 1) Library Functions (in-built functions)
- 2) User Defined Functions (written by programmer himself)

What is an IDE (Integrated Development Environment)?

An IDE is a special type of software which helps in writing, editing, compiling and executing the program of a particular programming language. Some IDE's have the capability of supporting many programming languages.

GCC stands for "GNU Compiler Collection", which is an integrated distribution of compilers for many programming languages such as C, C++, Java, Fortran, Ada, etc.

1-D Arrays

Arrays

An array is a finite set of homogenous elements stored in contiguous memory locations.

An array is highly useful when we want to store multiple values belonging to same data type.

Array indexing starts from 0 in most of the languages.

Declaring an array

```
int arr[n]; // array size is n
```

Initializing an array

```
int arr[] = {1,5,6,7,8};  
float sc[] = {1.2,1.3,1.5};  
int ar[5] = {100,200}; // by default rest cells will be 0
```

Reading an array

Array elements can be accessed by `array_name[element_index];`

Array index ranges from 0 to n-1 for an array of size n.

[WAP to give sum and average of all array elements]

1. Declare an array ARR of size N
2. Input values for ARR
3. Declare a variable SUM = 0 and AVG = 0;
4. Declare I = 0
5. While (I < N) repeat steps 6,7
6. SUM = SUM + ARR[I]
7. I++
 [end of while loop]
8. AVG = SUM / N
9. Display SUM and AVG
10. END

[WAP to return the largest number in an array]

1. Declare an array ARR of size N
2. Enter N elements of ARR
3. Declare a variable MAX = ARR[0]
4. Declare I = 1
5. While (I < N) repeat 6,7
6. If (MAX < ARR[I])
 then, MAX = ARR[I]
 [END of If]
7. I++
 [End of While]
8. Display MAX
9. END

2-D Array

A double dimensional array is a collection of rows.

While initializing a 2-D array defining the no of columns is compulsory.

```
int a[][3]; //this is a valid declaration  
float a[][]; //this is an invalid declaration
```

[Matrix addition]

1. Define three matrices A[m][n] B[m][n] and C[m][n]
2. For each I < m repeat 3,6
3. For each J < n repeat 4,5
4. C[i][j] = a[i][j] + b[i][j]
5. J++
 [end of j loop]
6. I++
 [end of I loop]
7. Print C
8. END