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C PROGRAMMING LANGUAGE

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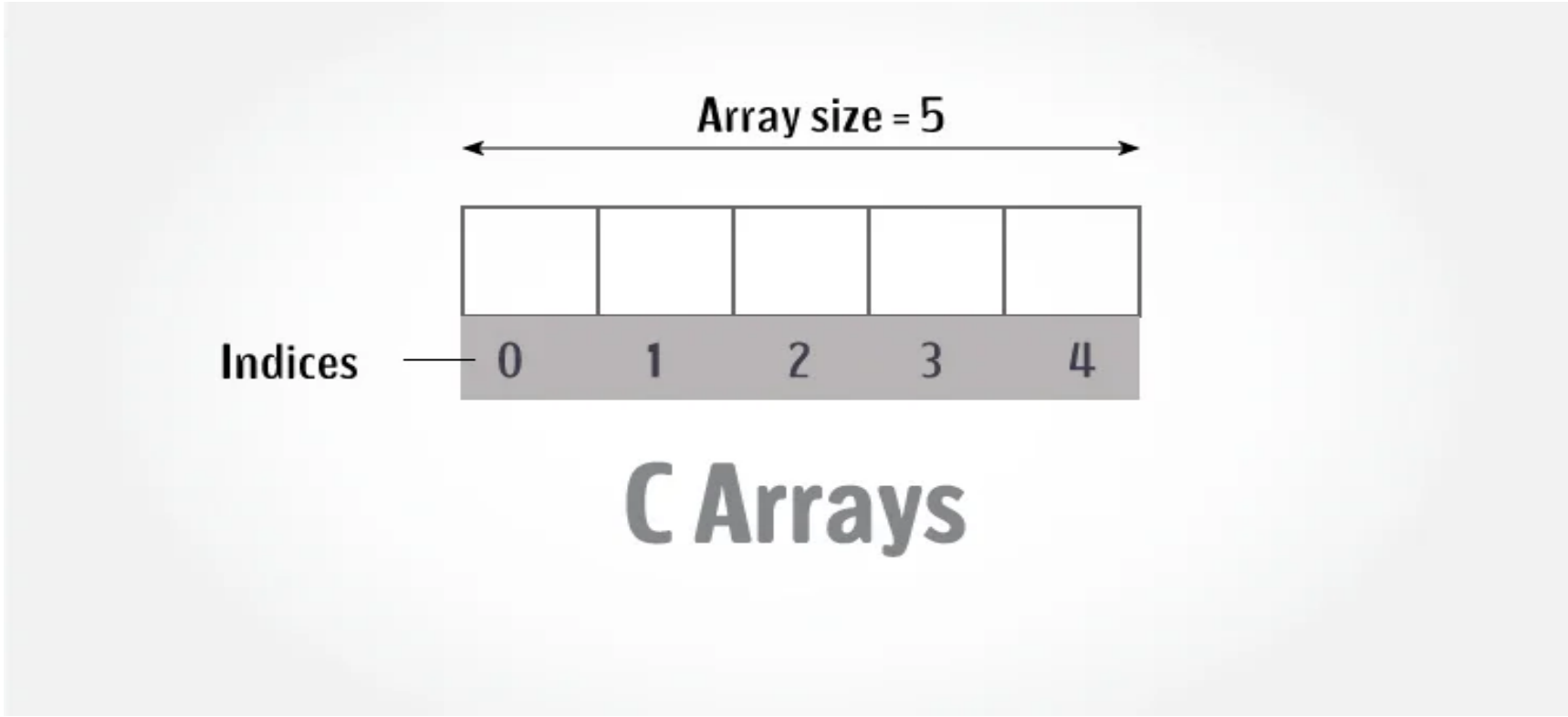
C ARRAYS

An array is defined as the collection of similar type of data items stored at contiguous memory locations.

Arrays are the derived data type in C programming language which can store the primitive type of data such as int, char, double, float, etc.

The array is the simplest data structure where each data element can be randomly accessed by using its index number.

C ARRAYS



HOW TO DECLARE AN ARRAY?

```
dataType arrayName[arraySize];
```

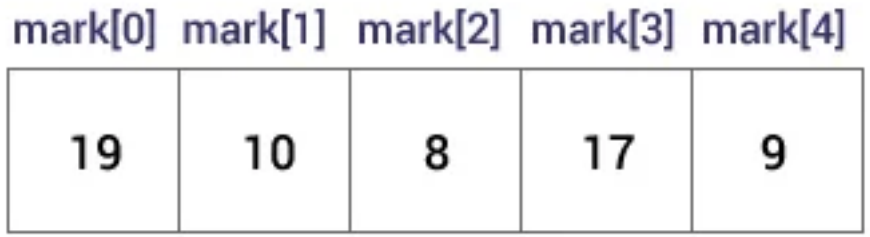
```
int marks[5];
```

HOW TO INITIALIZE AN ARRAY?

- It is possible to initialize an array during declaration

```
int mark[5] = {19, 10, 8, 17, 9};

int mark[] = {19, 10, 8, 17, 9};
```



HOW TO INITIALIZE AN ARRAY?

```
#include<stdio.h>
int main()
{
    int i=0;
    int marks[5]={20,30,40,50,60};//declaration and initialization of array

   //traversal of array
    for(i=0;i<5;i++)
     {
        printf("%d \n",marks[i]);
     }
     return 0;
}
```

ARRAY INPUT/OUTPUT

```
#include <stdio.h>

int main() {
  int values[5];

  printf("Enter 5 integers: ");

  // taking input and storing it in an array
  for(int i = 0; i < 5; ++i) {
     scanf("%d", &values[i]);
  }

  printf("Displaying integers: ");

  // printing elements of an array
  for(int i = 0; i < 5; ++i) {
     printf("%d\n", values[i]);
  }
  return 0;
}
```

CALCULATE AVERAGE

TWO DIMENSIONAL ARRAY IN C

The two-dimensional array can be defined as an array of arrays.

The 2D array is organized as matrices which can be represented as the collection of rows and columns.

Declaration of two dimensional Array in C

SYNTAX:

```
data_type array_name[rows][columns];
```

EXAMPLE

```
int twodimen[4][3];
```

TWO DIMENSIONAL ARRAY IN C

	Column 1	Column 2	Column 3	Column 4
Row 1	x[0][0]	x[0][1]	x[0][2]	x[0][3]
Row 2	x[1][0]	x[1][1]	x[1][2]	x[1][3]
Row 3	x[2][0]	x[2][1]	x[2][2]	x[2][3]

```
// Different ways to initialize two-dimensional array

int c[2][3] = {{1, 3, 0}, {-1, 5, 9}};

int c[][3] = {{1, 3, 0}, {-1, 5, 9}};

int c[2][3] = {1, 3, 0, -1, 5, 9};
```

TWO-DIMENSIONAL ARRAY TO STORE AND PRINT VALUES

```
// 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 vlues 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;
}a
```

SUM OF TWO MATRICES