



Arrays

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Variables

- We usually store data in variables.
- WHAT IF WE WANT TO STORE DATA IN 100 VARIABLES AT THE SAME TIME?

IS IT POSSIBLE TO COMPLETE THIS TASK SO EASILY?

Arrays

What is an array?

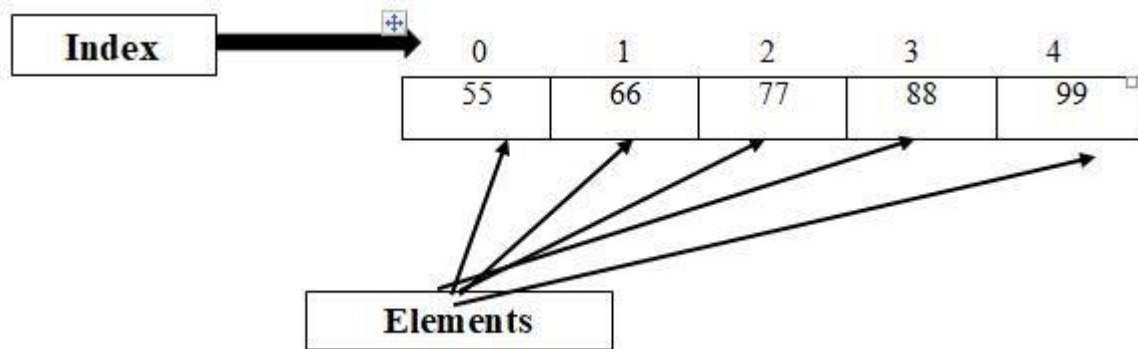
- A fixed length sequential collection of data elements of same data type.
- Array is used to represent list of data.
 - For example: list of numbers, list of name, list of products, list of students etc.

Arrays

- A regular variable stores a single data
- An array stores multiple data of similar type
- Each data in an array is accessed by an index
 - Kind of like our school attendance sheet

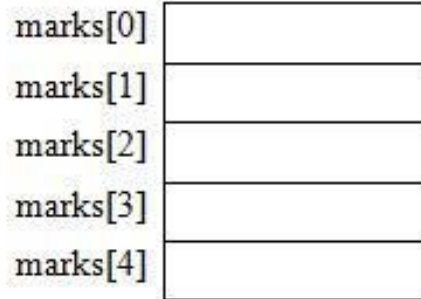
Format of Array

- Each of the location is a compartment
- In array, a number is used to indicate these compartment so that we can easily access them is known as **Index**. **Index** always starts from 0.
- Value that are stored in each compartment are called **Elements**



Array declaration

- `<data type> <array name>[<size>;`
- Example: `float marks[5];`
- Declaring the array will result in this:



Value Assign

The values to the array elements can be assigned as:

marks [0] = 55.5

marks [1] = 44.5

marks [2] = 77.0

marks [3] = 99.0

marks [4] = 88.5

After assign values the array is as:

marks[0]	55.5
marks[1]	44.5
marks[2]	77.0
marks[3]	99.0
marks[4]	88.5

Programming a 1-D Array

```
#include<stdio.h>
int main()
{
    float marks[5];
    int counter;
    for(counter=0;counter<5;counter++)
    {
        scanf(" %f", &marks[counter]);
    }
    return 0;
}
```

Array initialization

```
int array[] = {2, 3, 5, 7, 8, 14}; // 6-length array  
int array[100] = {0}; // 0 in all elements!!!
```

Array element access

- Just like the students table, an array element is accessed by its roll number (typically called its index)
- Difference between roll number and array index – array index starts from zero!!!

Array element access

Index	0	1	2	3	4	5	6	7	8	9
Data	4.0	3.9	3.7	3.8	3.8	3.2	2.9	3.9	3.5	3.8

```
cgpa[0] = 4.0;  
scanf("%f", &cgpa[2]);  
printf("%f\n", cgpa[4]); // output is 3.8
```

So now the array name along with the index acts as the variable!!!

```
# include <stdio.h>
```

```
int main() {  
    int a[10000];  
    int sum = 0, i;  
  
    for(i = 0; i < 10000; i++)  
        scanf("%d", &a[i]);  
  
    for(i = 0; i < 10000; i++)  
        sum += i;  
  
    printf("The sum is %d\n", sum);  
    return 0;  
}
```