Arrays

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Agenda

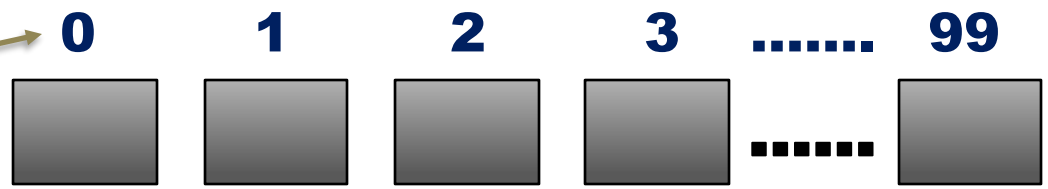
- Introduction to Array
- Array Declaration Rules
- Bound Checking
- Example Programs
- Sorting
- Function Call by Passing Arrays
- Two Dimensional Arrays
- Multi-dimensional Arrays

Introduction to Array

- Array is a linear collection of similar elements.
- Array is also known as subscript variable
- Array is a group of variables.

Write a program to calculate average of 100 numbers.

index
Subscript value



[ ] → subscript operator

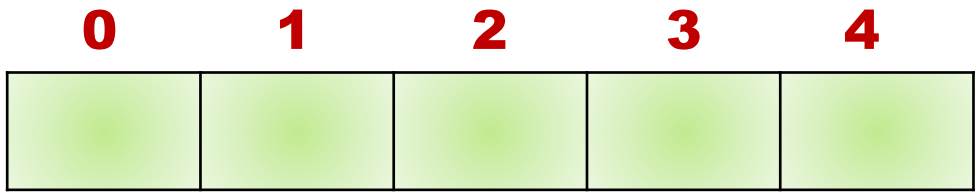
```
int main()
{
    int arr[100];
}
```

Array Declaration Rules

1. int a[ ]; → // Error can't be empty

2. int a[5]; →
   - Natural number
   - Total number of variables in array
   - Not an index

3. int a[5];

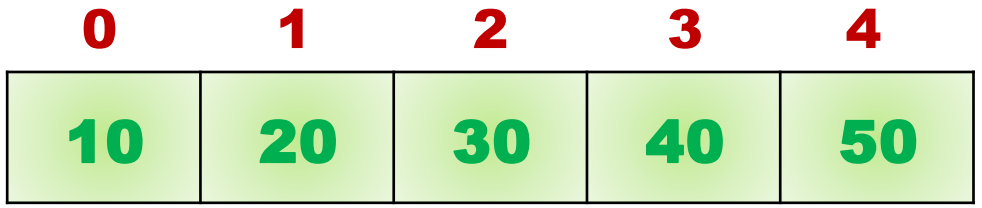


- local array when not initialized contains garbage values.

- whatever is the size of an array it always consumes memory in a sequential fashion.

4. You can initialize array during declaration

- int a[5] = {10, 20, 30, 40, 50};

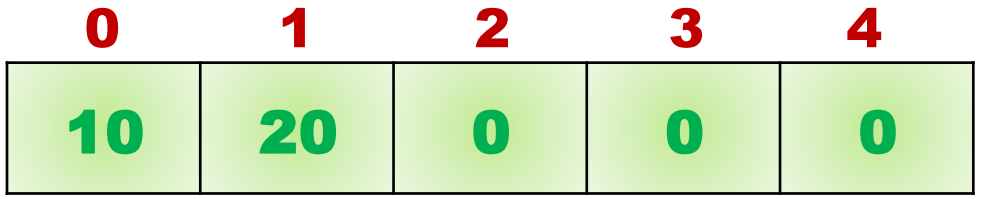


5. You cannot initialize an array during declaration more than its size

- int a[5] = {10, 30, 40, 50, 60, 70}; → Error

6. **You can initialize an array during declaration with lesser values than the size of an array.**

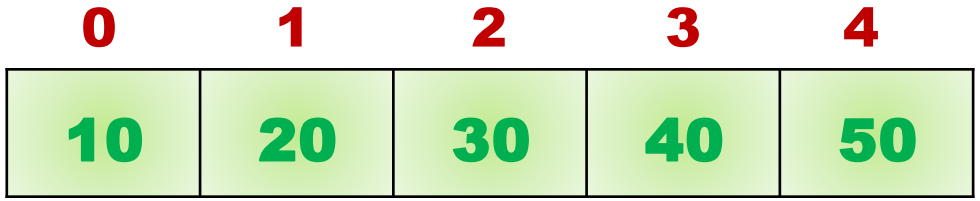
- **int a[5] = {10, 20};**



- **Remaining variables in array will contain 0, and not garbage valve.**

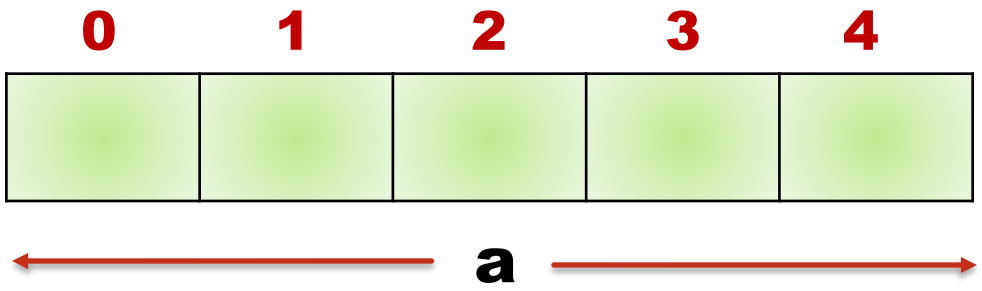
7. **During declaration you can leave [ ] empty only when you initialize array at the same time.**

- **int a[ ] = {10, 20, 30, 40, 50};**



Bound Checking

- int a[5] = {10, 20, 30, 40, 50, 60, 70}; ⟶ **Error**




```
int main()
{
    int Arr[5],x;
    cout<<"Enter Values : ";
    for(x=0; x<=10; x++)
        cin>>Arr[x];
}
```

No Bound Checking Concept in C Language

Example Programs

- **Write a program to calculate the sum of numbers stored in an array of size 10. Take array values from the user.**

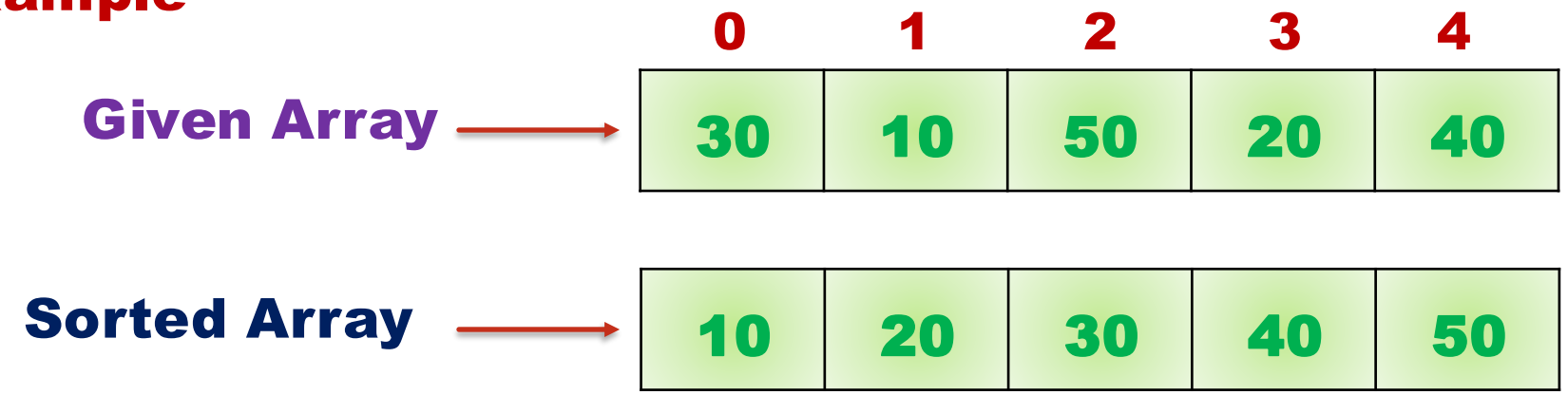
Example Programs

- **Write a program to calculate the sum of all even numbers and sum of all odd numbers, which are stored in an array of size 10. Take array values from the user.**

Sorting

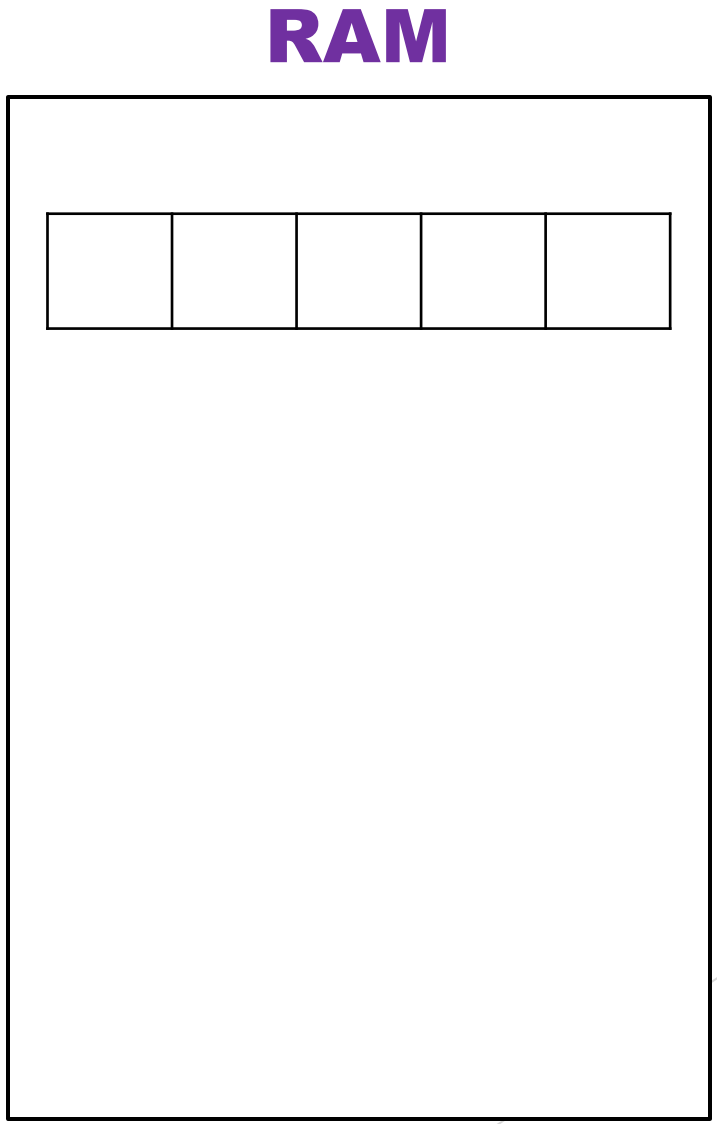
- Arranging elements in some logical order is known as sorting
- By default, for numbers sorting means arranging elements in ascending order

Example



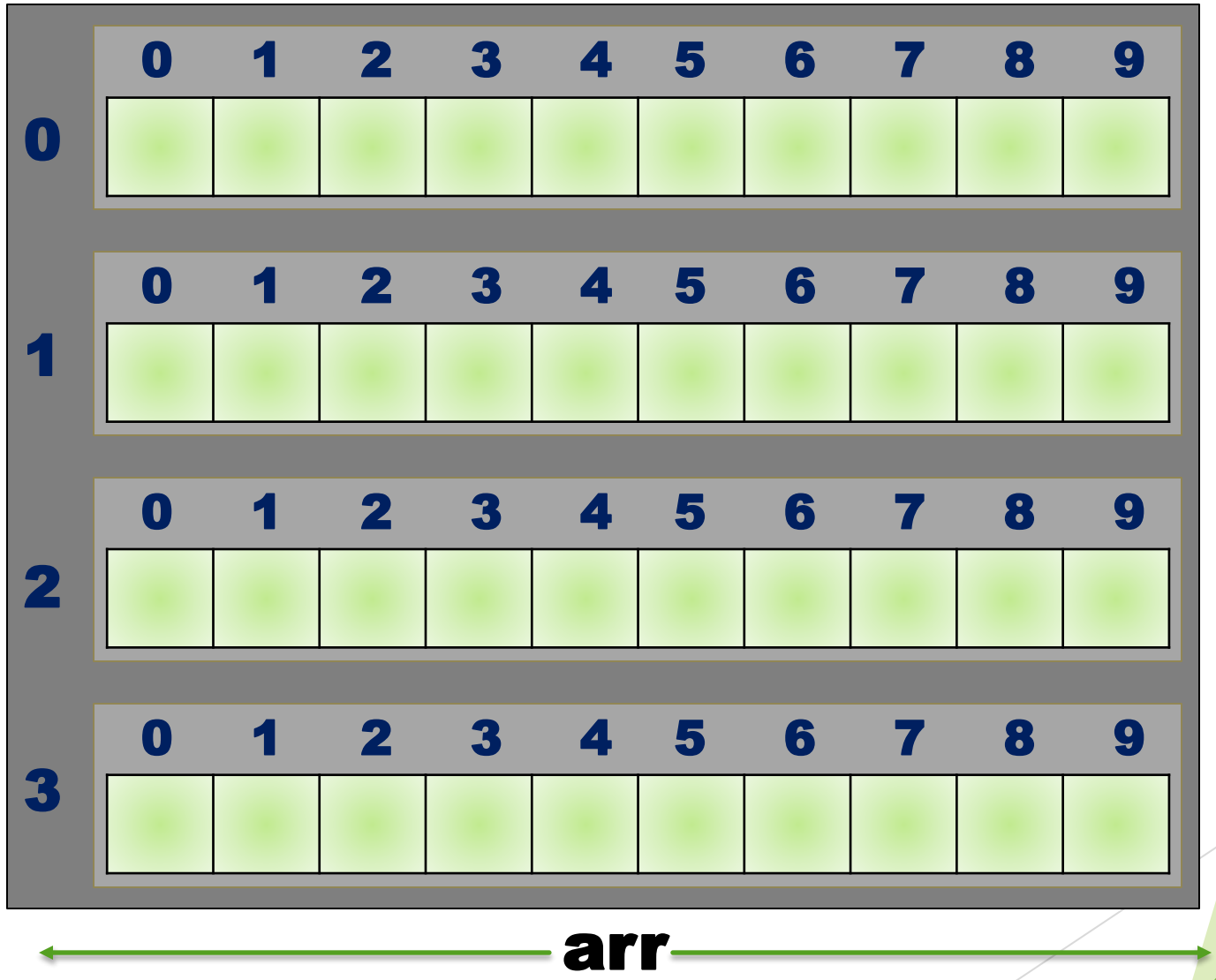
Function Call by Passing Arrays

```
void F1(int Arr1[])
{
    for(int x=0; x<5; x++)
    {
        Arr1[x]+=1;
    }
}
int main()
{
    int Arr[] = {1,2,3,4,5};
    F1(Arr);
    for(int x=0; x<5; x++)
        cout<<Arr[x]<<" ";
}
```



Two Dimensional Arrays

```
int arr[4][10];
```



Multi-dimensional Arrays

int Arr[3][4][10];