

CS 111

arrays

Model declaration for array

```
BASE_TYPE ARRAY_NAME [ CAPACITY ]
```

- This creates CAPACITY variables with BASE_TYPE

Model declaration for array

```
BASE_TYPE ARRAY_NAME [ CAPACITY ]
```

- To process all elements in the array we follow this model:

```
for(int x = 0; c < CAPACITY; c++){  
    PROCESS ARRAY_NAME [c];  
}
```

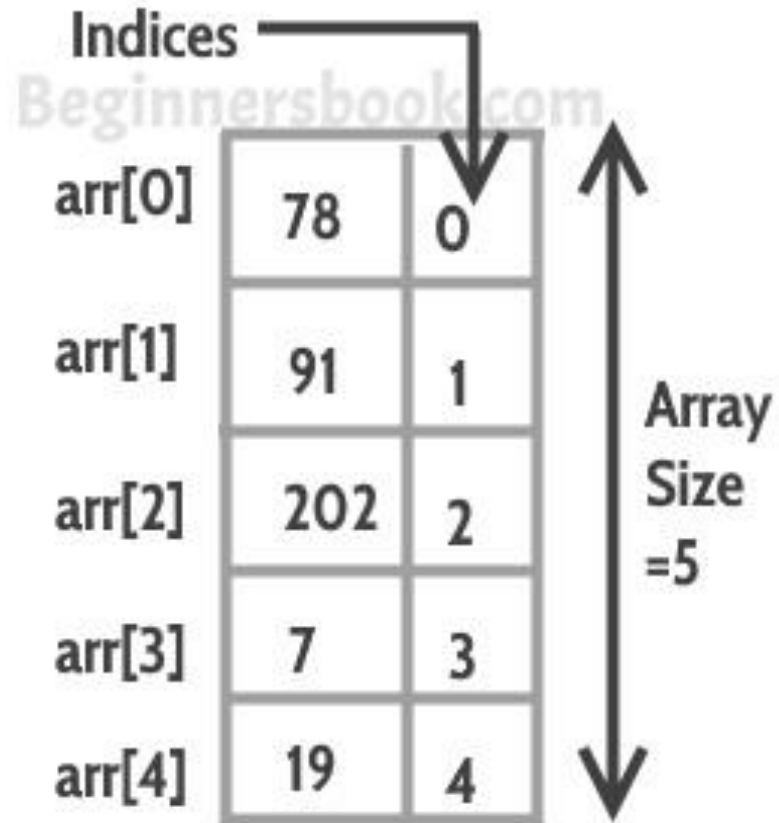
- The loop hits all array elements because they are numbered from 0 to CAPACITY - 1

Example questions

1. The array **senate** has capacity 100 and contains strings. How do we declare it?
2. The array **digits** has capacity 10 and contains 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. How do we declare and initialize it?
3. What's the output of the code segment below?

```
int data[4] = {3, 1, 4, 1};  
cout << data[2];
```

```
int arr[5] = {78, 91, 202, 7, 19}
```



from <https://beginnersbook.com/2017/08/cpp-arrays>

Example questions

1. Array **digits** contains integers and has capacity 10. What is the for loop control to move through its elements?
2. Inside the for loop, what action will be used to add 5 to each element?

Example questions

1. Say that instead we want to process the array **digits** so as to add 5 only to elements that are divisible by 3. Should we change the loop control?
2. That means we must change the action. Write a new loop to perform the required task.

Example 1

```
int digits[10] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};  
// adds 5 to number stored at each array index  
for(int c = 0; c < 10; c++){  
    digits[c] += 5;  
}
```


Example 2

```
int digits[10] = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};  
// add 5 to only to elements that are divisible by 3  
for(int c = 0; c < 10; c++){  
    if(digits[c] % 3 == 0){  
        digits[c] += 5;  
    }  
}
```

Example 3

```
int digits[5]; // declare int array
// read in input
for(int i = 0; i < 5; i++){
    cin >> digits[i];
}
// print elements in array
for(int j = 0; j < 5; j++){
    cout << digits[j] << " ";
}
```