

2. Array Declaration and Initialization

2.1 Basic Array Declaration

Python vs C Comparison:

Python	C
<code>numbers = [1, 2, 3, 4, 5]</code>	<code>int numbers[5] = {1, 2, 3, 4, 5};</code>
<code>grades = []</code>	<code>float grades[100];</code>
<code>name = "Alice"</code>	<code>char name[10] = "Alice";</code>

C Array Declaration Syntax:

```
data_type array_name[size];  
data_type array_name[size] = {value1, value2, ...};
```

2.2 Different Initialization Methods

2.2.1 Complete Initialization

```
int numbers[5] = {10, 20, 30, 40, 50};  
char vowels[5] = {'a', 'e', 'i', 'o', 'u'};  
float prices[3] = {12.5, 25.0, 8.75};
```

2.2.2 Partial Initialization

```
int scores[10] = {95, 87, 92}; // First 3 elements initialized  
                               // Remaining 7 elements = 0  
char grades[5] = {'A', 'B'}; // grades[0]='A', grades[1]='B'  
                               // grades[2]=grades[3]=grades[4]='\0'
```

2.2.3 Size Inference

```
int data[] = {1, 2, 3, 4, 5};    // Size automatically becomes 5
char message[] = "Hello World"; // Size becomes 12 (including '\0')
```

2.2.4 Zero Initialization

```
int zeros[100] = {0};           // All elements initialized to 0
char buffer[50] = "";           // All characters initialized to '\0'
```

2.2.5 Uninitialized Arrays (Dangerous!)

```
int uninitialized[10];          // Contains garbage values!
// Always initialize arrays before use
```

2.3 Array Size and Memory

Understanding Array Size:

```
int numbers[5];                 // 5 integers × 4 bytes = 20 bytes
char name[20];                  // 20 characters × 1 byte = 20 bytes
double values[10];              // 10 doubles × 8 bytes = 80 bytes

// Getting array size at compile time
int size = sizeof(numbers) / sizeof(numbers[0]); // Result: 5
```

Python vs C Size Operations:

Python	C
<code>len(list)</code>	<code>sizeof(array) / sizeof(array[0])</code>
<code>list.append(item)</code>	Not possible with static arrays
<code>list.pop()</code>	Not possible with static arrays

Revision #1

Created 2025-09-15 00:52:31 UTC by DS

Updated 2025-09-15 00:53:10 UTC by DS