Tutorial 13 - Arrays & Pointer Arithmetic in C++

Arrays & Pointer Arithmetic in C++

Arrays in C++

- An **array** is a collection of similar data types stored in contiguous memory locations.
- **Syntax:**

```
int marks[4] = {23, 45, 56, 89};
cout << marks[0] << endl;  // Accessing elements

```

- **Key Points:**
  - Array indexes start from **0**.
  - Data is stored in a **continuous memory block**.
- **Example:**

```
int mathMarks[4];
mathMarks[0] = 2278;
mathMarks[1] = 738;
cout << mathMarks[0] << mathMarks[1];

```

- **Modifying Elements:**

```
marks[2] = 333;  // Updates value at index 2

```

- **Using Loops:**

```
for (int i = 0; i < 4; i++) {
    cout << "marks[" << i << "] = " << marks[i] << endl;
}

```

Pointers and Arrays

- The **name of an array** is a pointer to its first element.
  - `marks` gives the address of the first index.
  - `&marks` is incorrect.
- **Pointer to Array:**

```
int* p = marks;
cout << *p;  // Value at first index

```

- **Pointer Arithmetic:**
  - Incrementing the pointer moves to the next index.

```
cout << *(p + 1);  // Value at index 1
cout << *(p + 2);  // Value at index 2

```

- **Example:**

```
int* p = marks;
cout << *p;          // Value at index 0
cout << *(p + 1);    // Value at index 1
cout << *(p + 2);    // Value at index 2
```