Types of Allocation

In this lesson, you will study the types of allocation.

We'll cover the following

Introduction

In C++, we can allocate memory in two ways:

- Static allocation
- Dynamic allocation

Static allocation

> *In **static allocation**, a fixed amount of memory is allocated to the variables or arrays before the execution of the program (during compile-time), and we cannot request more memory during the running program.*

In static allocation:

- We must know the size of an array or variable during the compile time.
- Memory is allocated and deallocated to the variables by the compiler.

So far, we have seen the static allocation.

Need for dynamic allocation

However, sometimes you will encounter a situation where you don't know in advance how much memory is needed to store the data.

Example program

Suppose you want to input a sentence from the user, but you don't know the exact characters needed in an array.

```
#include <iostream>
using namespace std;

int main() {
  char sentence [10];
  cout << "Please write your sentence:" << endl;
  cin >> sentence;
  cout << sentence;
}
```

Explanation

- If you initialize an array with fewer characters than the size of an input sentence, then you may get an error.
- If you initialize an array with more characters than the actual size of an input sentence, then the unused memory is wasted.

Here, dynamic allocation comes in.

Dynamic allocation

> *In **dynamic allocation**, we can get as much memory as we want during the program execution.*

In dynamic allocation:

- We can get more memory during the running program from the free store.
- Memory is allocated and deallocated by the programmer during the run-time.

Quiz

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Which of the following statements are true about static memory allocation?

(You can select multiple correct answers)

Retake Quiz

Let’s get into the details of the allocation of dynamic memory in C++.