Variables and Memory

Learn how variables are stored in memory.

> **We'll cover the following** ∧
>
> - Variables
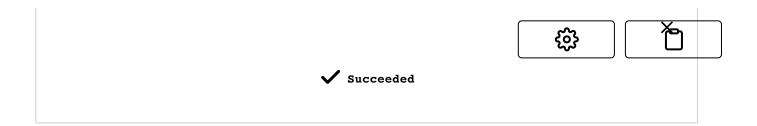>   - How are variables stored in memory?
>   - Address of a variable

Variables#

To understand pointers, you must know how variables are stored in memory.

We have already seen that a variable is a named location in a computer's memory where we can store our data.

See the program given below!

```cpp
#include <iostream>

using namespace std;

int main() {
   // Declares a variable John of type int
   int John;
}
```
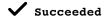
How are variables stored in memory?#

Consider the analogy given in the previous lesson. The statement on **Line No.** 7 says reserve the consecutive 4 houses for `John` in the **Memory Society**. We don't decide where `John` will actually live. This is automatically done by the society owner named **Operating System**. **Operating System** will allocate a space in the **Memory Society** that will have a unique address to locate it. Suppose it is **1003**.

So in the computer program, the statement on **Line No. 7** will reserve **4 bytes** for the variable `John` at some location in the memory.

Address of a variable#

Let's store something in `John` house. See the program given below!

```cpp
1   #include <iostream>
2
3   using namespace std;
4
5   int main() {
6       // Declares a variable John of type int
7       int John;
8       // Stores 10 in variable John
9       John = 10;
10  }
```

After some time, `John` stores something in his storage house, and he uses the address of the storage house to reach it and not his name.
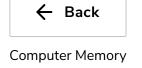
So when the program executes, we think that the data is accessed and modified using the identifier. But this is not how things work!

During the compilation time, the compiler maps each variable name to the unique memory address in the memory. Our machine accesses and modifies all the data by their addresses in the computer's memory. But why use an identifier when we can access our data using the memory address?

Identifiers have to be used because we have to declare multiple variables in a single program, so it must be difficult for the human to remember all the addresses. Therefore, we use identifiers to keep things simple.

In the upcoming lesson, you will learn how to get the address of variables in C++.

Stay tuned!

⚠ Report an Issue