Variables and Memory

In this lesson, you will learn how variables are stored in memory.

We'll cover the following

Variables

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

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

See the program given below!

```
#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!

```
#include <iostream>

using namespace std;

int main() {
  // Declares a variable John of type int
  int John;
  // Stores 10 in variable John
  John = 10;
}
```

After some time, `John` stores something in his storage house, and he uses the address of the storage house to reach it, not his name.

So when our 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. You must be thinking, why use an identifier when we can access our data using the memory address?

The answer is 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.

Quiz

Who maps each identifier to a unique address in memory?

Retake Quiz

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

Stay tuned!