Data Types

Let's discuss various data types supported in C++.

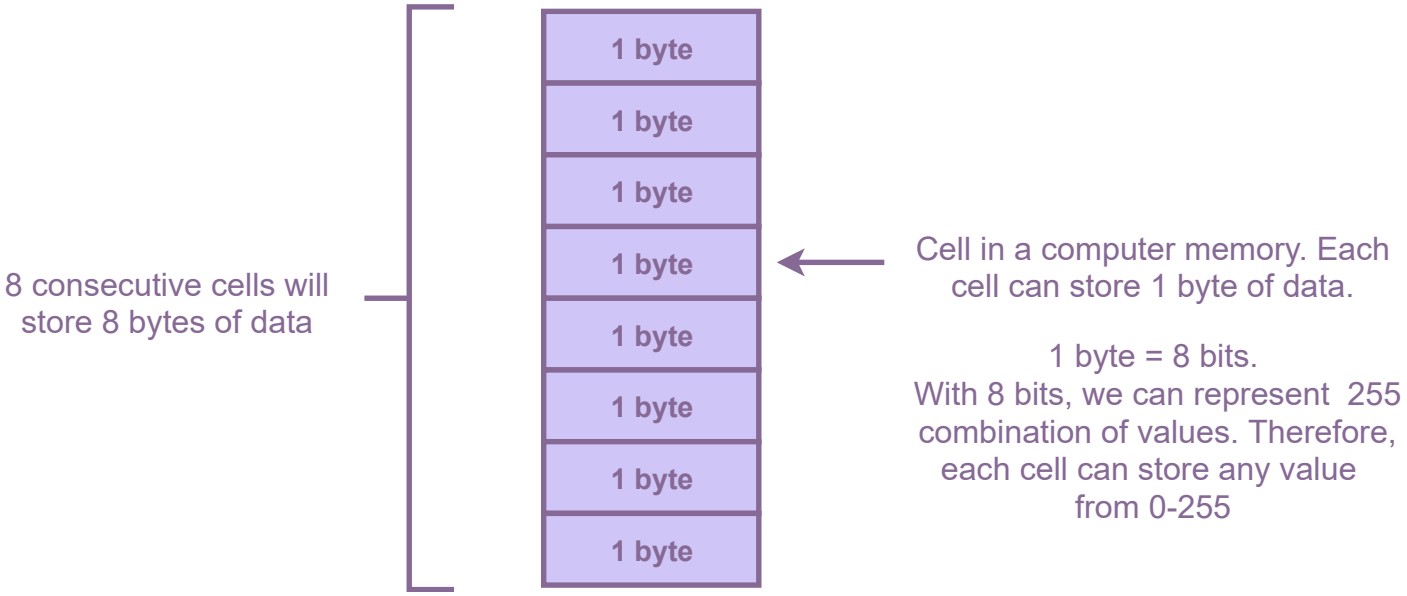
We'll cover the following

Introduction to computer memory

Consider an Excel sheet that consists of a large number of cells, and each cell is used to store data. We can locate each cell in the Excel sheet using a row and column number.

Computer memory *is just like an Excel sheet that contains cells of data arranged in a logical order.*

However, in the computer's memory, cells are arranged linearly. Each cell in memory can store **1 byte** of data. As we know, **1 byte** = **8bit**; therefore, each cell can store any value from 0-255.



Memory representation

Introduction to data types

Run the code below and see the output!

```
#include <iostream>

using namespace std;

int main() {
  int number = 10;
  cout << "Number = " << number << endl;
}
```

Data types

The code given above declares a variable `number` of type `int`, stores 10 in the `number,` and then prints its value. How does the compiler know how much memory should be allocated to the particular variable? Here is where data types come in!

In the variable declaration, it is necessary to specify the data type before the identifier. Therefore, C++ is a statically-typed language. Data type reserved the space for the particular variable based on its type. Here, `int` is a data type, and it can only store an integer value.

__Data type__ tells the compiler what type of data a particular variable can store. The compiler allocates the memory to the variable based on its data type.

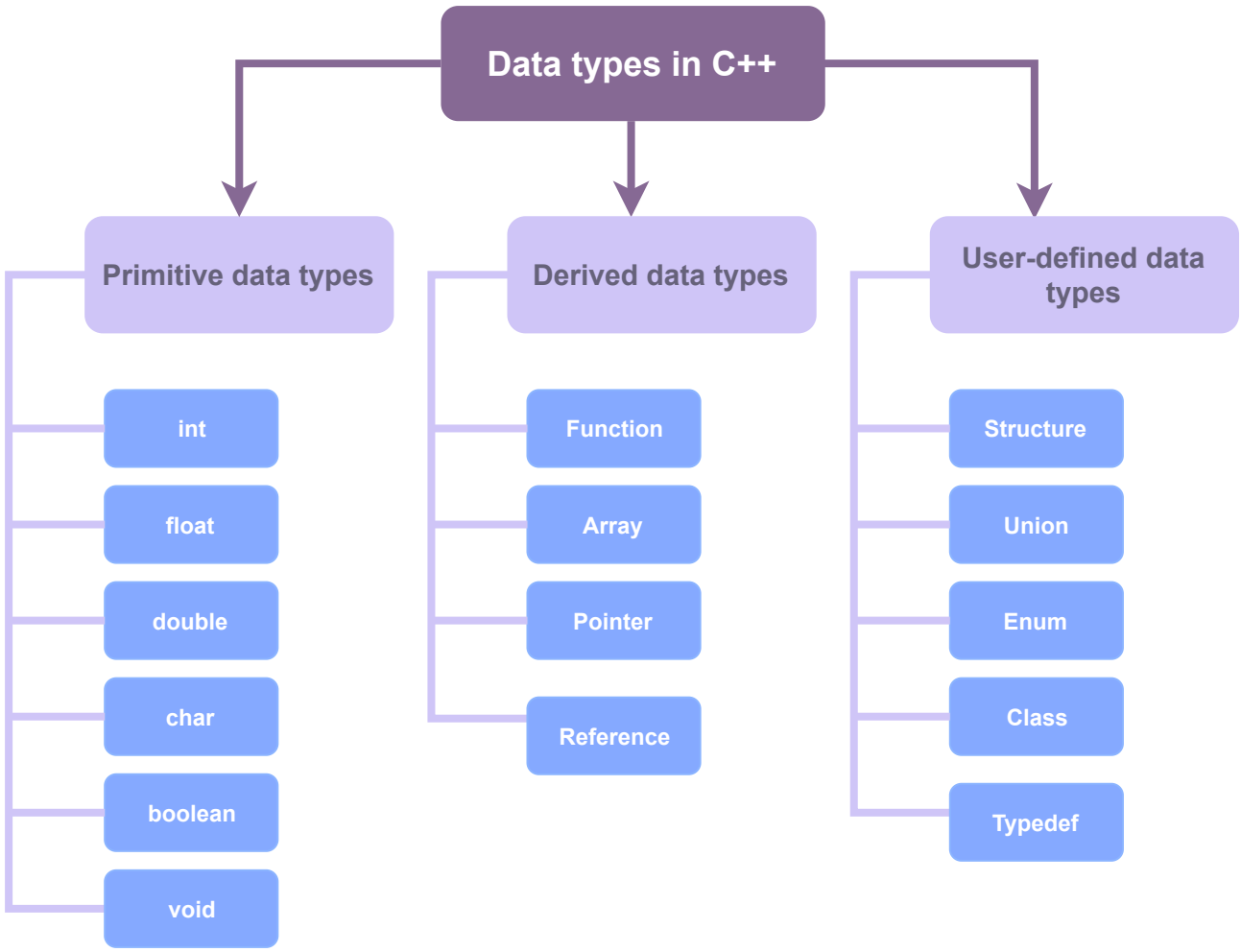
Data types do the following two things:

- Specify the type of value a particular variable can store, i.e., variable declared with `int` data type can store integer values only.
- Reserve the number of bytes for a variable in memory, i.e., a variable with `int` type will reserve four consecutive bytes in memory. With **4 bytes**, we can represent any value from **-2147483648 to 2147483647**. Therefore, the range of values that a variable can store depends upon its data type.

Data types in C++

C++ supports the following datatypes:

- Primitive or Fundamental data types
- Derived data types
- User-defined data types



Data types in C++

Primitive or fundamental data types

Primitive data types are predefined data types. These are:

- Integer
- Floating-point
- Double
- Void
- Character
- Boolean

Derived data types

Data types that are derived from primitive data types are known as derived data types. These are:

- Function
- Arrays

- Arrays
- Pointers
- Reference

User-defined data types

Data types that are defined by the user are known as user-defined data types. These are:

- Structure
- Union
- Enum
- Class
- Typedef

We will cover the details of derived data types and user-defined data types in the later chapters.

Quiz

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Which of the following are the derived data types?

(You can select multiple correct options)

Retake Quiz

Let’s discuss primitive data types in the upcoming lesson. See you there!