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| **Assignment # 3**  Theory of Programming Languages | |
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| Assignment | Is IEEE Standard 754 Floating Point Numbers in C++ followed or not justify it with examples. |

**Assignment**. IEEE Standard 754 Floating Point Numbers Supported in C++ or not?

No, IEEE Standard 754 Floating point numbers is not followed in C++. There exist numerous libraries which provide the capability to store floating point numbers in IEEE 754 standard, but it inherently doesn’t support the standard. In order to prove non-availability of this standard in C++ following examples can be studied.

**Example**. Declaring IEEE 754 data type floating points in C++.

#include <iostream>

#include "ieee754\_types.hpp"

int main() {

IEEE\_754::\_2008::Binary<32> x = 1.0;

IEEE\_754::\_2008::Binary<64> y = 2.0;

std::cout << x + y << std::endl;

// Compile time error if the requested type doesn't exist in the system.

// IEEE\_754::\_2008::Binary<16> z;

}

In above example data type of 32 bits and 64 bits variables are declared. In case a language doesn’t support above data types, it will return an error. In C++ above declaration is returning an error. This depicts that IEEE Standard 754 Floating Point Numbers is not supported in C++.

**Solution.** Including library in C++ Program to accommodate the error.

In order to solve this issue, a developer has submitted a library for C++. If it is included as a header in our program it should make above declaration compatible.

[*https://github.com/kkimdev/ieee754-types*](https://github.com/kkimdev/ieee754-types)

