

# Using C++

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Oct 9, 2009  
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# Outline

- Why use C++
- Useful Features of C++
- eclipse, a free IDE for writing C++ program
- Doxygen, a document generator

# Why Use C++

C++ code can run as fast as C.

C++ contains many enhancements to C.  
What could be done in C can be done in C++.

C++ contains many feature which makes it  
easier to write OO code.

Two popular languages C#, Java are OO  
language with similar features in C++.

# Useful Feature of C++

- Class  
for Object Oriented Programming
- Template / Standard Template Library  
generic programming

# Useful Features of C++ *Class*

Four features commonly present in OO language (wikipedia):

- Abstraction
- Encapsulation
- Inheritance
- Polymorphism

# Usefull Features of C++ Template / Standard Template Library

- Template  
*for function, class*
- Standard Template Library  
*vector, map, set;  
sort*

# Eclipse, a free IDE for writing C++ program

- Eclipse is open source, original released by IBM.
- It is a powerful Integrated Development Environment for many languages: Java, Fortran, C++, etc.
- It is free, run on Linux, windows, Mac.
- Similar to Visual Studio (in some way).

# Eclipse, a free IDE for writing C++ program

You can do most of the tasks for programming using eclipse. It is very useful to

- Write code.  
*comment/uncomment, code completion*
- Read code.  
*code folding, syntax highlighting, call graph, outline*
- Refactor code, compare code.

# Eclipse, a free IDE for writing C++ program

## Others aspects

- Support for Integrated debugging,
- Eclipse and the Parallel Tools Platform,
- Many plugins: UMLet,

# Doxygen, a free document generator

- It is a documentation generator for C++, C, Java, Fortran, etc.
- It extracts documentation from the source file comments.
- It support many different style of documentation tags, including tags from JavaDoc, some basic html tags and latex formulas.
- It can generate inheritance diagrams for C++ class.

# Doxygen, a free document generator

Users include

- GNU Standard C++ Library,
- OpenOffice.org, cross-platform office suite,
- KDE, a linux desktop environment,
- MySQL, *the world's most popular open source database*,
- Open MPI
- etc.

# Doxygen, how to use it

You write comment block with some additional markings.

JavaDoc style comment block is

```
/**  
 * get the negative vector of v0.  
 * @param v0    input/output vector.  
 */  
void EBM2D_reverseVector(double v0[2])  
{  
    v0[0] = - v0[0];  
    v0[1] = - v0[1];  
}
```