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## Using C++: A First Step

Copyright 2011 by William P. Rudolph.

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## Overview

- Preliminaries
  - Compilers
  - IDE vs. Command Line
- Getting Started
  - Downloading the compiler
  - Developing a program
  - Running the program
  - Compiler errors

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- A Closer Look at C++
  - Types and declarations
  - Expressions and statements
  - Functions
  - Namespaces
  - Pointers
- Organizing the program
  - Source Files
  - Header Files

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- Examples
- Classes and Structures
- Standard Library
- More examples

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## Preliminaries

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## Compilers

- Visual C++
- GCC (G++)
  - MinGW
  - CygWin
- Intel
- Comeau Computing

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## Creating a Program

- IDE (Integrated Development Environment)
  - Visual Studio
  - Eclipse
- Command Line Processing
  - Compiler
  - Editor

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## Getting Started

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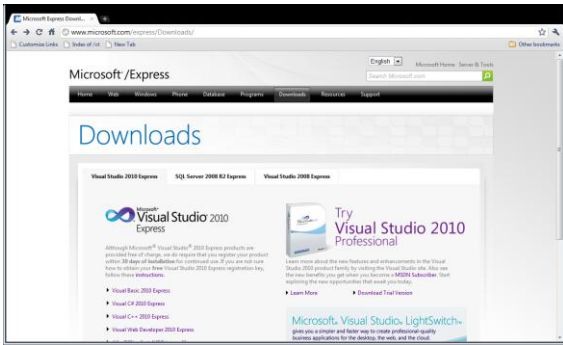
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## Downloading the Compiler



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## Developing a Program

- Preprocessing
- Compilation
  - Transforming human readable source code into machine instructions.
- Linking
  - Putting the various translation units together
  - Incorporating shared libraries (e.g. dlls)

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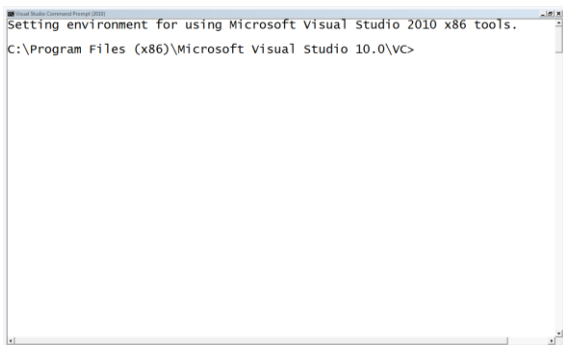
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## Contents of directory prior to compilation

```

F:\Programs\VisualExpress_CPP\presentation>dir
Volume in drive F is Work Disk
Volume Serial Number is 40BE-E336

Directory of F:\Programs\VisualExpress_CPP\presentation

02/17/2011  01:42 PM    <DIR>          .
02/17/2011  01:42 PM    <DIR>          ..
02/17/2011  01:42 PM                18 main.cpp
02/17/2011  01:42 PM                23 run.bat
               2 File(s)         41 bytes
               2 Dir(s)    67,902,595,072 bytes free

F:\Programs\VisualExpress_CPP\presentation>

```

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## run.bat

```

cl.exe /EHsc main.cpp

```

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## main.cpp

```

int main()
{
}

```

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## Compilation of program

```

Microsoft Command Prompt (2008)
F:\Programs\VisualExpress_CPP\presentation>run
F:\Programs\VisualExpress_CPP\presentation>cl.exe /EHsc main.cpp
Microsoft (R) 32-bit C/C++ Optimizing Compiler Version 16.00.30319.01 for
Copyright (C) Microsoft Corporation. All rights reserved.

main.cpp
Microsoft (R) Incremental Linker Version 10.00.30319.01
Copyright (C) Microsoft Corporation. All rights reserved.

/out:main.exe
main.obj
F:\Programs\VisualExpress_CPP\presentation>

```

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## Contents of directory after compilation

```

Microsoft Command Prompt (2008)
F:\Programs\VisualExpress_CPP\presentation>dir
Volume in drive F is Work Disk
Volume Serial Number is 40BE-E336

Directory of F:\Programs\VisualExpress_CPP\presentation

02/17/2011  02:06 PM  <DIR>          .
02/17/2011  02:06 PM  <DIR>          ..
02/17/2011  01:42 PM                18 main.cpp
02/17/2011  02:07 PM            31,744 main.exe
02/17/2011  02:07 PM                492 main.obj
02/17/2011  01:42 PM                23 run.bat
                4 File(s)          32,277 bytes
                2 Dir(s)          67,902,398,464 bytes free
F:\Programs\VisualExpress_CPP\presentation>

```

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## Running the program

```

Microsoft Windows [64-bit] Desktop Environment
F:\Programs\VisualExpress_CPP\presentation>main
F:\Programs\VisualExpress_CPP\presentation>

```

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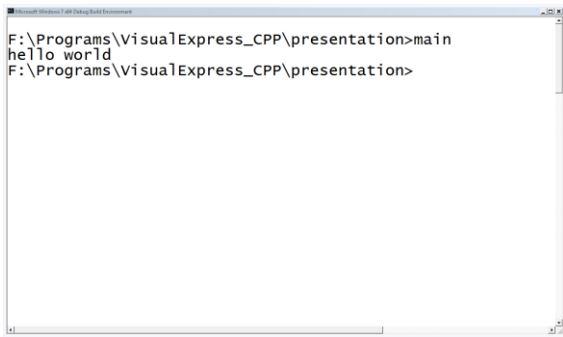
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```
#include <iostream>\n\nint main()\n{\n    std::cout<<"hello world";\n}
```

Executable Size: 118784 bytes

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### Running the program

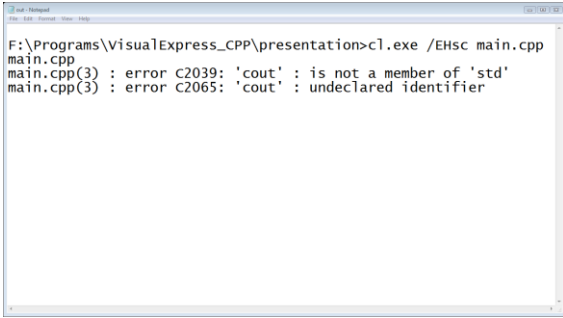


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```
#include <iostream>\n\nint main()\n{\n    std::cout<<"hello world";\n}
```

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### Compilation Errors



```
F:\Programs\VisualExpress_CPP\presentation>c1.exe /EHsc main.cpp
main.cpp
main.cpp(3) : error C2039: 'cout' : is not a member of 'std'
main.cpp(3) : error C2065: 'cout' : undeclared identifier
```

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```
#include <iostream>

int main()
{
    std::cout<<"hello world";
}
```

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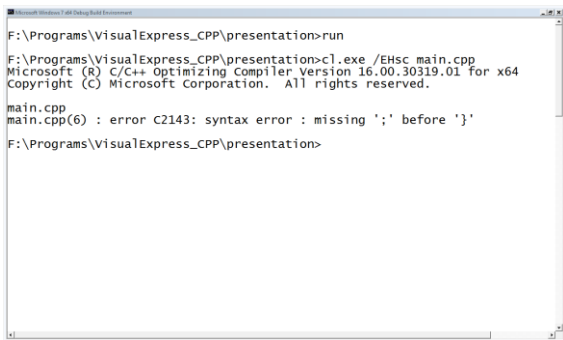
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### Compilation Errors



```
F:\Programs\VisualExpress_CPP\presentation>run
F:\Programs\VisualExpress_CPP\presentation>c1.exe /EHsc main.cpp
Microsoft (R) C/C++ Optimizing Compiler Version 16.00.30319.01 for x64
Copyright (C) Microsoft Corporation. All rights reserved.
main.cpp
main.cpp(6) : error C2143: syntax error : missing ';' before '}'
F:\Programs\VisualExpress_CPP\presentation>
```

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Additional  
content will be  
made available  
by March 11,  
2011.

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