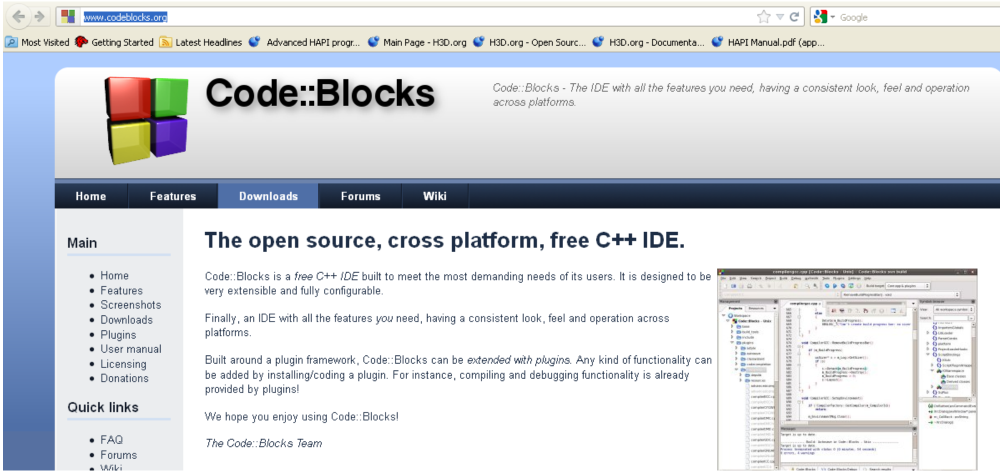
Image Processing using OpenCV

OpenCV is a collection of freely available C/C++ libraries specially meant for image processing and computer vision applications. For coding, compiling and executing our programs, we shall use the open source IDE - Code::Blocks.

Installation of CodeBlocks

Go to the download section in *http://www.codeblocks.org/*.



The open source, cross platform, free C++ IDE.

Code::Blocks is a *free C++ IDE* built to meet the most demanding needs of its users. It is designed to be very extensible and fully configurable.

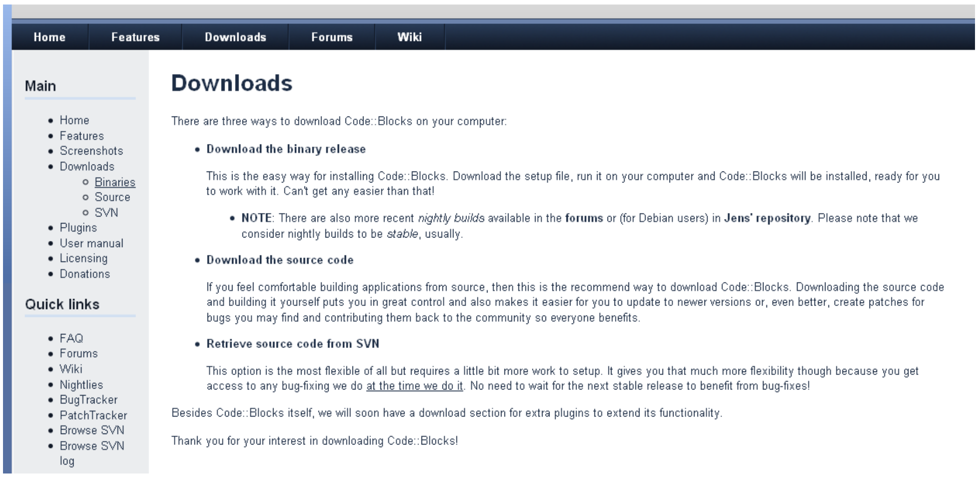
Finally, an IDE with all the features *you* need, having a consistent look, feel and operation across platforms.

Built around a plugin framework, Code::Blocks can be *extended with plugins*. Any kind of functionality can be added by installing/coding a plugin. For instance, compiling and debugging functionality is already provided by plugins!

We hope you enjoy using Code::Blocks!

The Code::Blocks Team

Select 'Binaries' under the Download options in the left hand side menu of the page.



Downloads

There are three ways to download Code::Blocks on your computer:

- **Download the binary release**

  This is the easy way for installing Code::Blocks. Download the setup file, run it on your computer and Code::Blocks will be installed, ready for you to work with it. Can't get any easier than that!

  - **NOTE**: There are also more recent *nightly builds* available in the **forums** or (for Debian users) in **Jens' repository**. Please note that we consider nightly builds to be *stable*, usually.

- **Download the source code**

  If you feel comfortable building applications from source, then this is the recommend way to download Code::Blocks. Downloading the source code and building it yourself puts you in great control and also makes it easier for you to update to newer versions or, even better, create patches for bugs you may find and contributing them back to the community so everyone benefits.

- **Retrieve source code from SVN**

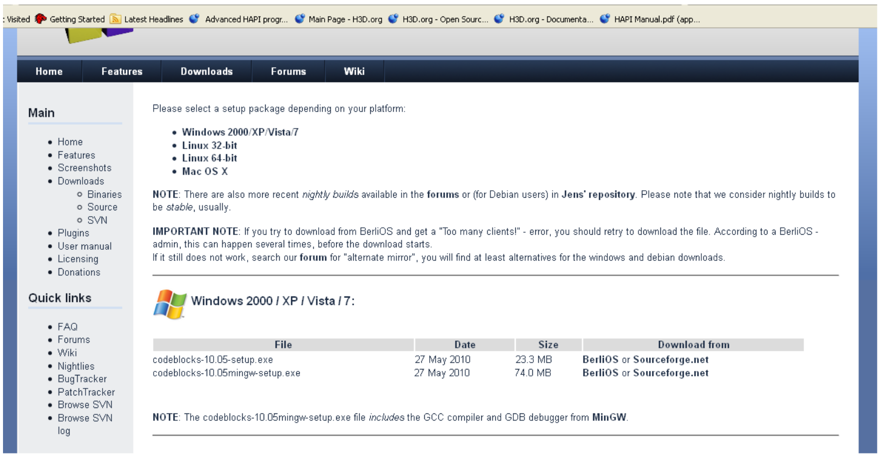
  This option is the most flexible of all but requires a little bit more work to setup. It gives you that much more flexibility though because you get access to any bug-fixing we do at the time we do it. No need to wait for the next stable release to benefit from bug-fixes!

Besides Code::Blocks itself, we will soon have a download section for extra plugins to extend its functionality.

Thank you for your interest in downloading Code::Blocks!

Download **codeblocks -10.05mingw-setup.exe** under the 'Windows' section and run the exe file to install Codeblocks. Do not change any default settings while installing.

Next, we will download OpenCV libraries.



Please select a setup package depending on your platform:

- **Windows 2000/XP/Vista/7**
- **Linux 32-bit**
- **Linux 64-bit**
- **Mac OS X**

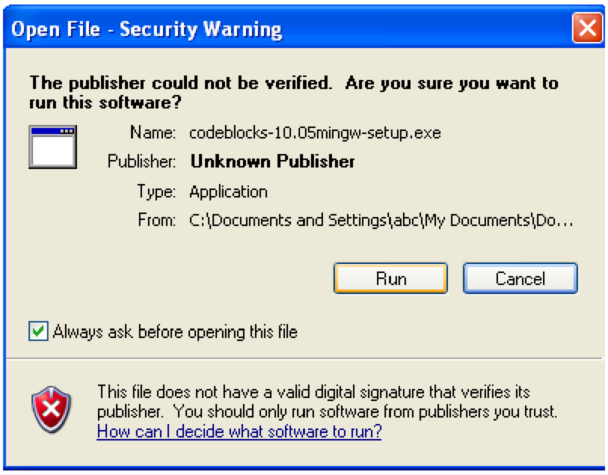
NOTE: There are also more recent *nightly builds* available in the **forums** or (for Debian users) in **Jens' repository**. Please note that we consider nightly builds to be *stable*, usually.

IMPORTANT NOTE: If you try to download from BerliOS and get a "Too many clients!" - error, you should retry to download the file. According to a BerliOS - admin, this can happen several times, before the download starts.
If it still does not work, search our **forum** for "alternate mirror", you will find at least alternatives for the windows and debian downloads.

Windows 2000 / XP / Vista / 7:

File	Date	Size	Download from
codeblocks-10.05-setup.exe	27 May 2010	23.3 MB	**BerliOS** or **Sourceforge.net**
codeblocks-10.05mingw-setup.exe	27 May 2010	74.0 MB	**BerliOS** or **Sourceforge.net**

NOTE: The codeblocks-10.05mingw-setup.exe file *includes* the GCC compiler and GDB debugger from **MinGW**.



The publisher could not be verified. Are you sure you want to run this software?

Name: codeblocks-10.05mingw-setup.exe
Publisher: **Unknown Publisher**
Type: Application
From: C:\Documents and Settings\abc\My Documents\Do...

☑ Always ask before opening this file

This file does not have a valid digital signature that verifies its publisher. You should only run software from publishers you trust. How can I decide what software to run?

Downloading OpenCV and configuring Codeblocks for OpenCV

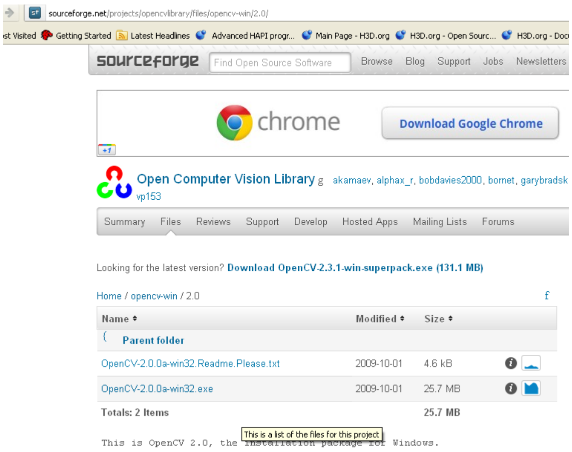
For most purposes Version 2.0 of OpenCV is sufficient.
Download the **OpenCV-2.0.0a-win32.exe** from
http://sourceforge.net/projects/opencvlibrary/files/opencv-win/2.0/
Run the exe file to install (extract) OpenCV.
Make sure to add OpenCV to the system path during installation itself.
Now, lets configure Codeblocks so that it can automatically locate the library files of OpenCV while compiling and executing our code.
Goto the menu Settings – Compiler and Debugger– Search Directories. In the 'compiler' tab, add the following link by clicking on the 'Add' button: (Assuming that the OpenCV files are present in C: drive of your system)

```
C:\OpenCV2.0\include\opencv
```

Next, In the 'Linker' tab, add the following link:

```
C:\OpenCV2.0\lib
```

Next, in the ‘Linker Settings’ section, add all the library files that are present in the ‘lib’ folder in OpenCV.



sourceforge.net/projects/opencvlibrary/files/opencv-win/2.0/

Open Computer Vision Library g akamaev, alphax_r, bobdavies2000, bornet, garybradsk vp153

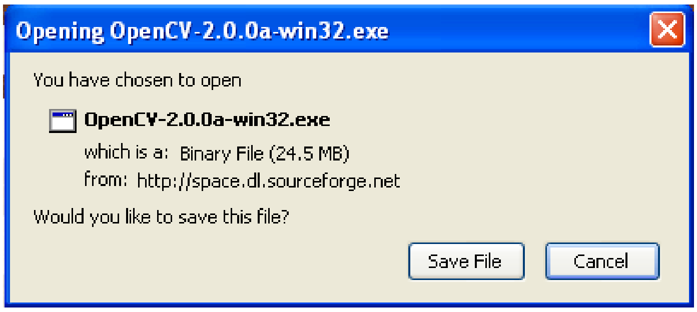
Looking for the latest version? **Download OpenCV-2.3.1-win-superpack.exe (131.1 MB)**

Home / opencv-win / 2.0

Name ♦	Modified ♦	Size ♦
Parent folder		
OpenCV-2.0.0a-win32.Readme.Please.txt	2009-10-01	4.6 kB
OpenCV-2.0.0a-win32.exe	2009-10-01	25.7 MB
Totals: 2 Items		**25.7 MB**

This is a list of the files for this project

This is OpenCV 2.0, the installation package for Windows.



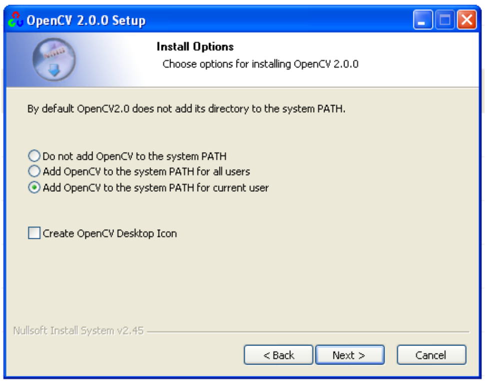
Opening OpenCV-2.0.0a-win32.exe

You have chosen to open

OpenCV-2.0.0a-win32.exe

which is a: Binary File (24.5 MB)
from: http://space.dl.sourceforge.net

Would you like to save this file?



OpenCV 2.0.0 Setup

Install Options

Choose options for installing OpenCV 2.0.0

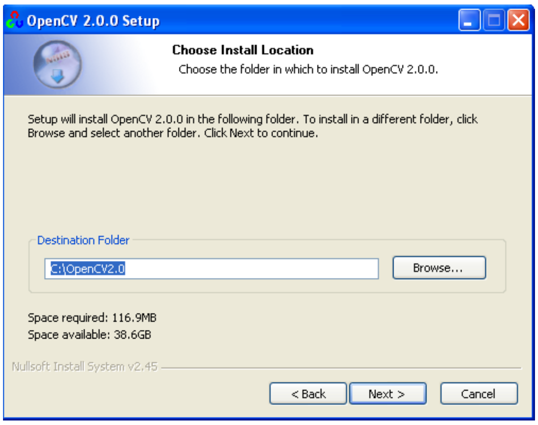
By default OpenCV2.0 does not add its directory to the system PATH.

○ Do not add OpenCV to the system PATH
○ Add OpenCV to the system PATH for all users
● Add OpenCV to the system PATH for current user

□ Create OpenCV Desktop Icon

Nullsoft Install System v2.45

Thats all ! Lets try a simple program using OpenCV that displays an image. For this, first we need to create a ‘Project’ in Codeblocks. Goto file menu –new –Project. Select ‘console Application’. Give the project any title, say, testopencv. The project can be saved anywhere in the system. For now, lets save it in Desktop inside a folder named ip. Make sure that the GNU-GCC compiler is selected. Type the following code in main.cpp of this project. Save an



OpenCV 2.0.0 Setup

Choose Install Location

Choose the folder in which to install OpenCV 2.0.0.

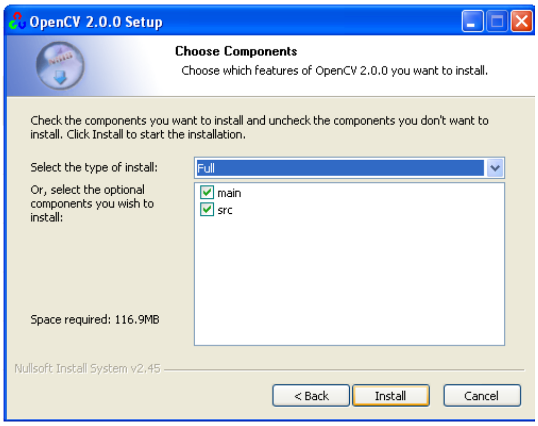
Setup will install OpenCV 2.0.0 in the following folder. To install in a different folder, click Browse and select another folder. Click Next to continue.

Destination Folder: C:\OpenCV2.0

Space required: 116.9MB

Space available: 38.6GB

Nullsoft Install System v2.45



OpenCV 2.0.0 Setup

Choose Components

Choose which features of OpenCV 2.0.0 you want to install.

Check the components you want to install and uncheck the components you don't want to install. Click Install to start the installation.

Select the type of install: Full

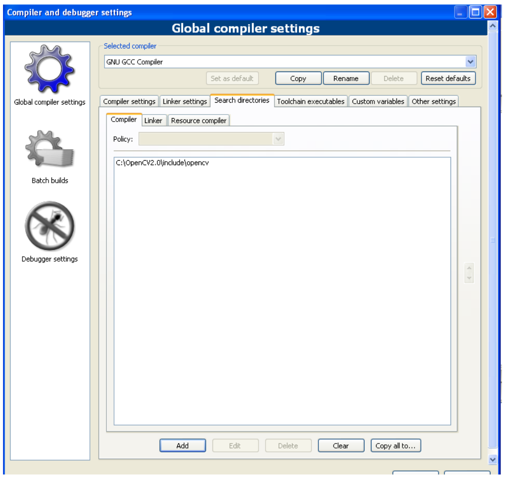
Or, select the optional components you wish to install:

☑ main

☑ src

Space required: 116.9MB

Nullsoft Install System v2.45



Compiler and debugger settings

Global compiler settings

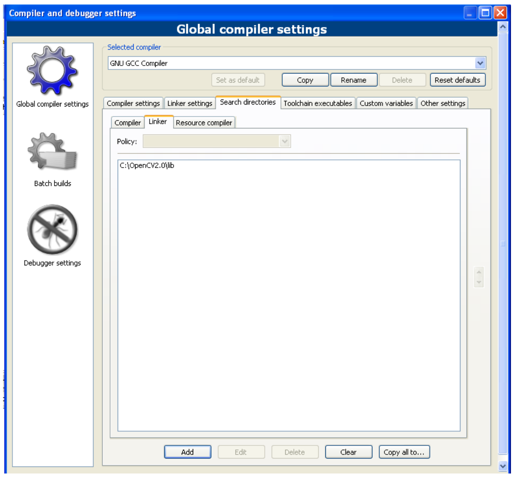
Selected compiler: GNU GCC Compiler

Search directories → Compiler

Policy:

C:\OpenCV2.0\include\opencv

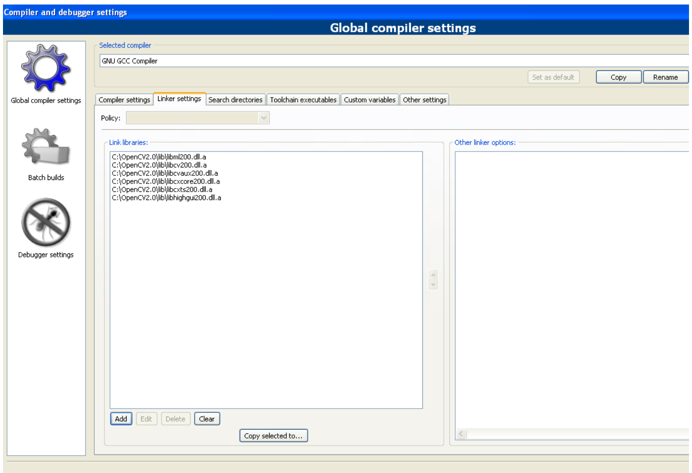
image say leaves.jpg inside the project folder (wherever the code file is present). Build and run the project. The image will be displayed in a separate window. After executing, if you get a linker error, then copy all the .dll files (present in the bin folder) into the project folder where the code file 'main.cpp' is present (as shown in the last screen-shot).



Selected compiler: GNU GCC Compiler

Policy:

```
C:\OpenCV2.0\lib
```



Selected compiler: GNU GCC Compiler

Policy:

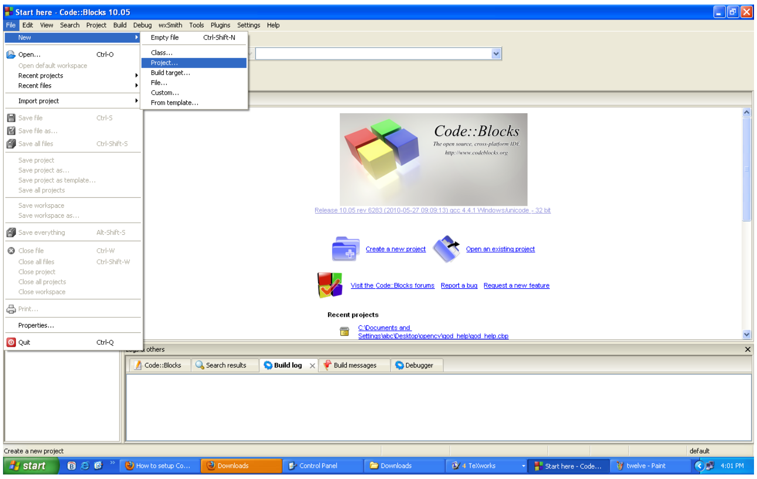
Link libraries:

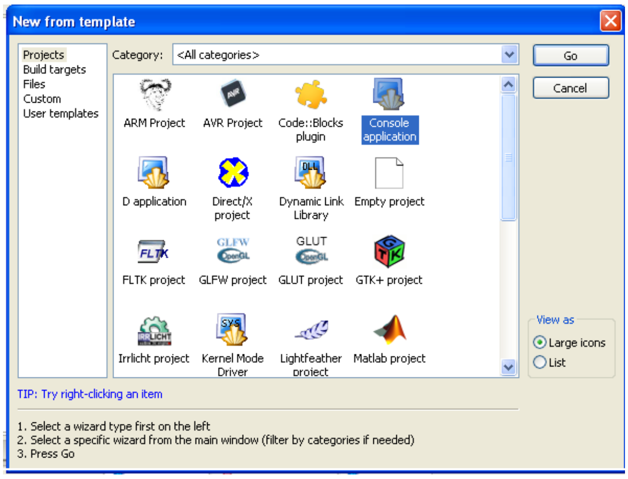
```
C:\OpenCV2.0\lib\libml200.dll.a
C:\OpenCV2.0\lib\libcv200.dll.a
C:\OpenCV2.0\lib\libcvaux200.dll.a
C:\OpenCV2.0\lib\libcxcore200.dll.a
C:\OpenCV2.0\lib\libcxts200.dll.a
C:\OpenCV2.0\lib\libhighgui200.dll.a
```

Other linker options:

```
#include <iostream>
#include "cv.h"
#include "highgui.h"
#include "cxcore.h"

using namespace std;

int main()
{

    IplImage* img = cvLoadImage( "leaves.jpg" );
    if( img == 0 ) {
        cout<< "Cannot load file \n" ;

    }
    cvNamedWindow( "Example1", CV_WINDOW_AUTOSIZE );
    cvShowImage("Example1", img);
    cvWaitKey(0);
    cvReleaseImage( &img );
    cvDestroyWindow( "Example1" );
    return 0;

}
```

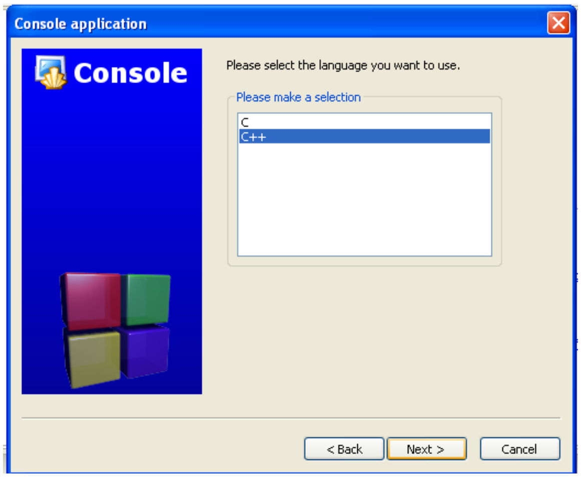
The above steps have been illustrated here:





TIP: Try right-clicking an item

1. Select a wizard type first on the left
2. Select a specific wizard from the main window (filter by categories if needed)
3. Press Go

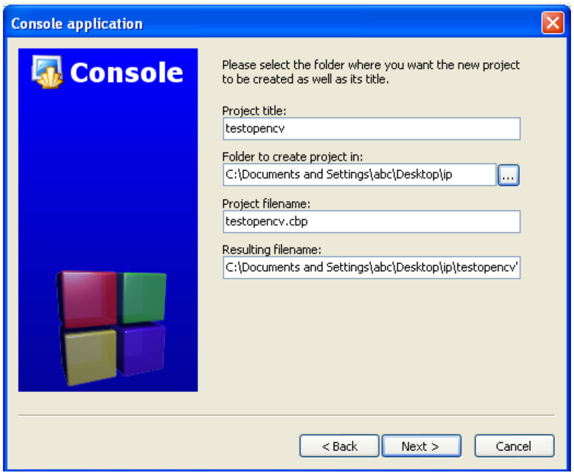


Please select the language you want to use.

Please make a selection

C

C++



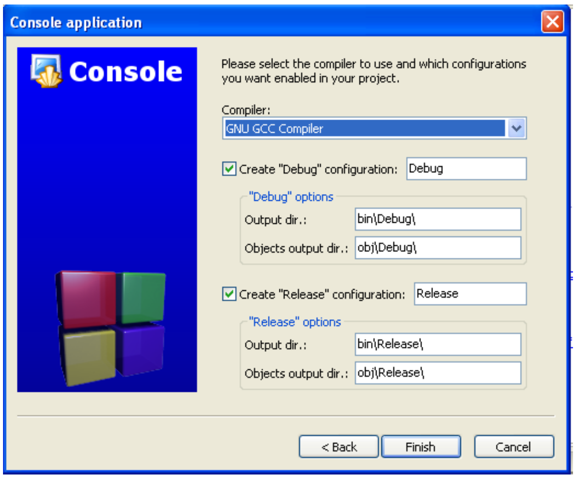
Please select the folder where you want the new project to be created as well as its title.

Project title: testopencv

Folder to create project in: C:\Documents and Settings\abc\Desktop\ip

Project filename: testopencv.cbp

Resulting filename: C:\Documents and Settings\abc\Desktop\ip\testopencv\



Please select the compiler to use and which configurations you want enabled in your project.

Compiler: GNU GCC Compiler

☑ Create "Debug" configuration: Debug

"Debug" options

Output dir.: bin\Debug\

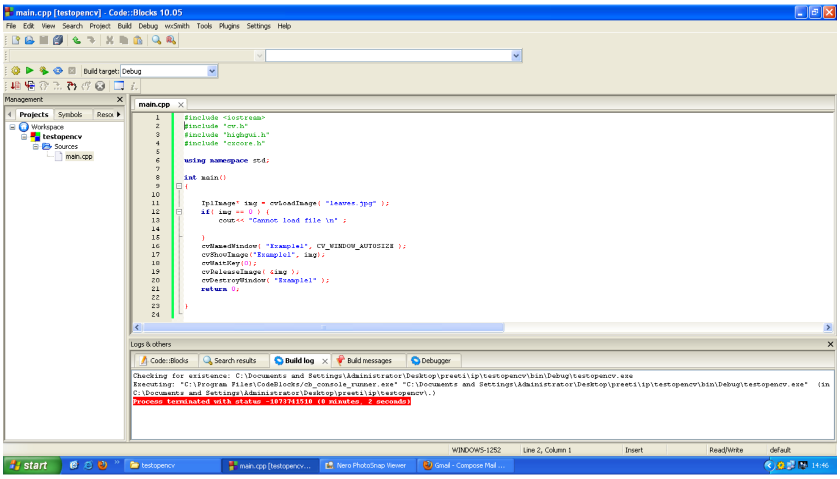
Objects output dir.: obj\Debug\

☑ Create "Release" configuration: Release

"Release" options

Output dir.: bin\Release\

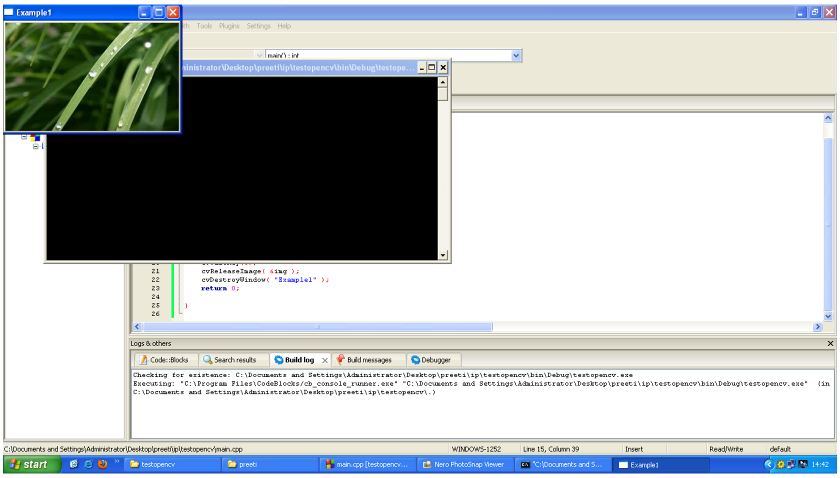
Objects output dir.: obj\Release\



main.cpp [testopencv] - Code::Blocks 10.05
File Edit View Search Project Build Debug wxSmith Tools Plugins Settings Help
Build target: Debug
Management
Projects Symbols Resou
Workspace
testopencv
Sources
main.cpp
Logs & others
Code::Blocks Search results Build log Build messages Debugger
WINDOWS-1252 Line 2, Column 1 Insert Read/Write default
start testopencv main.cpp [testopencv... Nero PhotoSnap Viewer Gmail - Compose Mail ... 14:46

```
#include <iostream>
#include "cv.h"
#include "highgui.h"
#include "cxcore.h"

using namespace std;

int main()
{

    IplImage* img = cvLoadImage( "leaves.jpg" );
    if( img == 0 ) {
        cout<< "Cannot load file \n" ;

    }
    cvNamedWindow( "Example1", CV_WINDOW_AUTOSIZE );
    cvShowImage("Example1", img);
    cvWaitKey(0);
    cvReleaseImage( &img );
    cvDestroyWindow( "Example1" );
    return 0;

}
```

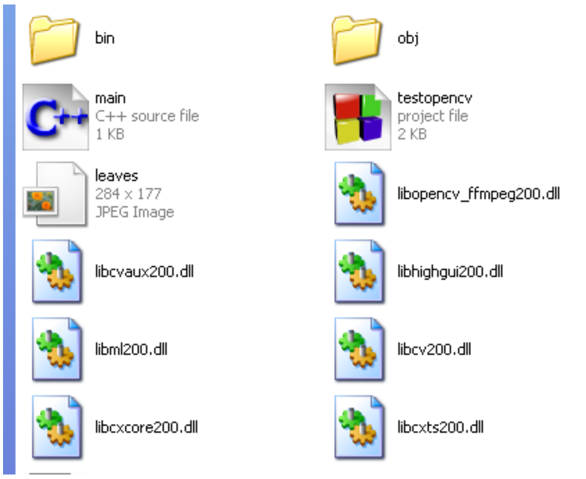
```
Checking for existence: C:\Documents and Settings\Administrator\Desktop\preeti\ip\testopencv\bin\Debug\testopencv.exe
Executing: "C:\Program Files\CodeBlocks/cb_console_runner.exe" "C:\Documents and Settings\Administrator\Desktop\preeti\ip\testopencv\bin\Debug\testopencv.exe"  (in
C:\Documents and Settings\Administrator\Desktop\preeti\ip\testopencv\.)
Process terminated with status -1073741510 (0 minutes, 2 seconds)
```



Example1
Tools Plugins Settings Help
main() : int
inistrator\Desktop\preeti\ip\testopencv\bin\Debug\testope...
Logs & others
Code::Blocks Search results Build log Build messages Debugger
C:\Documents and Settings\Administrator\Desktop\preeti\ip\testopencv\main.cpp
WINDOWS-1252 Line 15, Column 39 Insert Read/Write default
start testopencv preeti main.cpp [testopencv... Nero PhotoSnap Viewer "C:\Documents and S... Example1 14:42

```
    cvReleaseImage( &img );
    cvDestroyWindow( "Example1" );
    return 0;

}
```

```
Checking for existence: C:\Documents and Settings\Administrator\Desktop\preeti\ip\testopencv\bin\Debug\testopencv.exe
Executing: "C:\Program Files\CodeBlocks/cb_console_runner.exe" "C:\Documents and Settings\Administrator\Desktop\preeti\ip\testopencv\bin\Debug\testopencv.exe"  (in
C:\Documents and Settings\Administrator\Desktop\preeti\ip\testopencv\.)
```



bin
obj
main
C++ source file
1 KB
testopencv
project file
2 KB
leaves
284 x 177
JPEG Image
libopencv_ffmpeg200.dll
libcvaux200.dll
libhighgui200.dll
libml200.dll
libcv200.dll
libcxcore200.dll
libcxts200.dll