Java, C#, Visual Basic .NET Developer's Guide to

Asprise OCR SDK 5.0

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www.asprise.com

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1   Introduction

1.1 About OCR

OCR (Optical Character Recognition) is the technology that allows you to transform images (e.g., images scanned from paper documents) into editable text-based computer files.

1.2 About Asprise OCR SDK

Embedded a high performance OCR engine, Asprise OCR SDK is OCR software development kit that can be used with Java, C#, Visual Basic (VB) .Net, Delphi, Borland C, etc. on multiple platforms – Windows, Linux, Mac OS, Solaris and AIX.

1.3 Features of Asprise OCR

An incomplete list of features offered by Asprise OCR:

♦   **Highest Level of Accuracy**
    Asprise OCR can easily recognize difficult documents of poor image quality

♦   **Excellent Format Retention**
    Text layouts on the input documents are preserved;

♦   **High Speed**
    Asprise OCR uses optimized OCR engine to perform excellent recognition in very short time;

♦   **Ease of Use**
    We strive to make the developer's life easier. Complex parameter configurations are removed from Asprise OCR SDK. You only have to supply the image document. Asprise OCR can intelligently determine the best setting internally.

♦   **Barcode Recognition**
    Beside characters (letters and numbers), Asprise OCR can recognize almost every kind of bar code. You can choose to recognize barcode or characters or both.

Currently, the following bar code formats are supported:
- CODE 128 (128b, 128C, 128raw)
- EAN 8 EAN 13
- UPC
- code 3 of 9
- code interleaved 2 of 5
- QR code

1.4 Compatibility of Asprise OCR SDK

Currently the following OS are supported:

OS	**Evaluation** version availability	**Licensed** version availability
Windows XP 32bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows XP 64bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows Vista 32bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows Vista 64bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows Server 32bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows Server 64bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows 7 32bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows 7 64bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows 8 32bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)
Windows 8 64bit	**Yes** (Java, VB, C, C++, VB.NET & C#)	**Yes** (Java, VB, C, C++, VB.NET & C#)

MacOS X PowerPC	**Yes** (Java & command line tool)	**Yes** (Java & command line tool)
MacOS X Intel	**Yes** (Java & command line tool)	**Yes** (Java & command line tool)
Linux 32bit	**Yes** (Java & command line tool)	**Yes** (Java & command line tool)
Linux 64bit	**Yes** (Java & command line tool)	**Yes** (Java & command line tool)
Solaris SPARC	**Yes** (Java & command line tool)	**Yes** (Java & command line tool)
Solaris x86	**Yes** (Java & command line tool)	**Yes** (Java & command line tool)
AIX	**No** (Please evaluate on other platforms)	**Yes** (Java & command line tool)
HP-UX	**No** (Please evaluate on other platforms)	**Yes** (Java & command line tool)

1.5 Languages Supported

Currently, Asprise OCR supports the following languages:

Language	Native name	ISO 639 code
Croatian	hrvatski jezik	hrv
Czech	čeština	ces
Danish	dansk	dan
Dutch	Nederlands	nld
English	English	eng
Finnish	suomi	fin
French	français	fra
German	Deutsch	deu
Greek	ελληνικά	ell
Hungarian	magyar	hun
Icelandic	Íslenska	isl
Indonesian	Bahasa Indonesia	ind
Italian	italiano	ita
Malay	bahasa Melayu	msa

Maltese	Malti	mlt
Norwegian	Norsk	nor
Polish	język polski	pol
Portuguese	português	por
Romanian	limba română	ron
Russian	русский язык	rus
Spanish	español	spa
Swedish	Svenska	swe

The evaluation version is able to recognize English (eng), Spanish (spa), Portuguese (por), German (deu) and French (fra). For other languages, for contact us.

2 Programming with Asprise OCR in Java

2.1 Asprise OCR for Java Installation

First, make sure that you have already installed Java runtime version 1.5 or above on your system.

Download a copy of Asprise OCR SDK from http://www.asprise.com/product/ocr. Simply unzip it to an empty folder. Let refer this folder as OCR_ HOME.

The file organization of Asprise OCR SDK distribution is as follows:

```
OCR_HOME
+--- images [folder, containing sample image documents]
+--- javadoc [Java docs]

+--- aocr.jar [Contains Asprise OCR classes]

+--- Asprise-OCR-SDK-Developers-Guide.pdf [This document]
+--- runDemox.bat/sh [OCR demos on different images]
```

2.2 Development Environment Setup

After you have obtained and unzipped the Asprise OCR SDK kit, you need to setup your development environment in order to develop Java applications with Asprise OCR. To do so, you only need to:

♦ **Put *aocr.jar* into your class path**

2.3 Jump Start

The following code demonstrates the basic usage of Asprise OCR:

```
1    import com.asprise.ocr.Ocr
2    ...
3
4    Ocr.setUp(); // one time setup
5    Ocr ocr = new Ocr(); // create a new OCR engine
6    ocr.startEngine("eng", Ocr.SPEED_FASTEST); // English
```

```
7   String s = ocr.recognize(new File[] {new File("test.png")},
        Ocr.RECOGNIZE_TYPE_ALL, Ocr.OUTPUT_FORMAT_PLAINTEXT);
8   System.out.println("Result: " + s);
9   ocr.stopEngine();
```

Line 1: Imports the Ocr class;

Line 5: Creates a new Ocr engine that recognizes English in fastest speed setting; The evaluation version is able to recognize English (eng), Spanish (spa), Portuguese (por), German (deu) and French (fra). For other languages, for contact us.

Line 8: All the OCR work is done here. The *recognizeAll* method of the *com.asprise.util.ocr.OCR* class recognizes all the characters and barcodes from the image and output them as a string.

Line 7 Performs the OCR on the specified file. The output format is set as plain text. Other supported formats are: XML (Ocr.OUTPUT_FORMAT_XML) and searchable PDF(Ocr.OUTPUT_FORMAT_PDF).

2.4 Input and Output

For the sample OCR code in above section, if the input is the figure below:
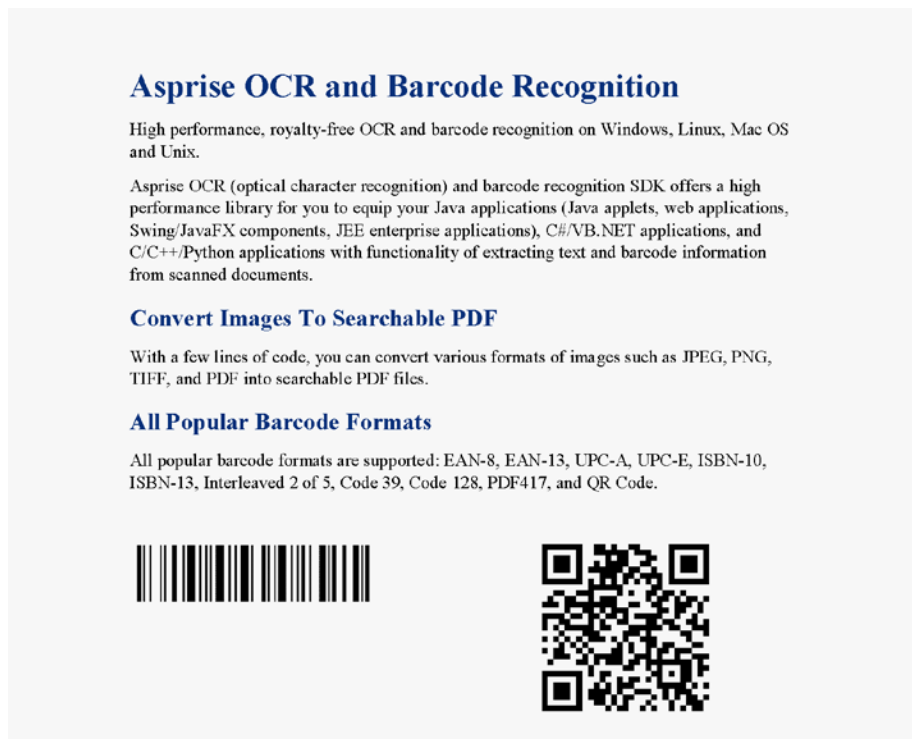
Then the output will be:

2.4.1 Plain-text Format

```
Asprise OCR and Barcode Recognition

High performance, royalty-free OCR and barcode recognition on Windows,
...
ISBN-13, Interleaved 2 of 5, Code 39, Code 128, PDF417, and QR Code.

[[QR-Code: www.asprise.com]]
[[CODE-128: Asprise]].
```

The last two lines represents bar code information extract. Note both the format and content of the barcode are enclosed in '[[ ]]' pairs.

2.4.2 XML Format

If you set the output format as OUTPUT_FORMAT_XML, you'll get:

```
<?xml version="1.0"?>
<asprise-ocr input="test.png">
  <page no="1" width="2400" height="3200" words="122"
confidence="88">
    <block type="text" x="321" y="254" width="1438" height="76"
words="5" confidence="86">
Asprise OCR and Barcode Recognition
    </block>
...
    <block type="barcode" subtype="QR-Code" x="1397" y="1484"
width="441" height="441" confidence="1">www.asprise.com</block>
    <block type="barcode" subtype="CODE-128" x="348" y="1489"
width="583" height="145" confidence="34">Asprise</block>
  </page>
</asprise-ocr>
```

Note that the coordinate information and confidence are available in the output.

2.4.3 PDF Format

If you set the output format as OUTPUT_FORMAT_PDF, you need specify the target output file as following:

```
ocr.recognize(new File[] {new File("test.png")},
  Ocr.RECOGNIZE_TYPE_ALL, Ocr.OUTPUT_FORMAT_PDF,
  Ocr.PROP_PDF_OUTPUT_FILE, "searchable.pdf",
  Ocr.PROP_PDF_OUTPUT_TEXT_VISIBLE, true);
```

Once the OCR done, you can open the PDF output file with any PDF viewer and perform searches:
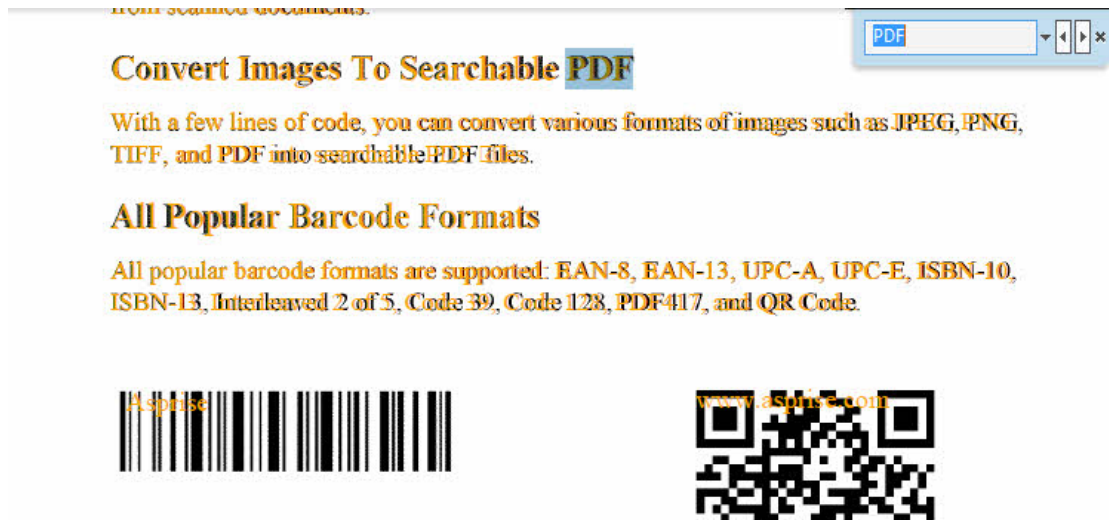
Note recognized text and barcodes are rendered in orange on top of the image. To make them transparent, you simply set:

```
Ocr.PROP_PDF_OUTPUT_TEXT_VISIBLE, false
```

2.5 Other Usages

This section covers other essential functions offered by the Ocr class.

2.5.1 Recognizes text only or barcode only

To save OCR time, you can choose to OCR text or barcode only:

Text only:

```
String s = ocr.recognize(new File[] {new File("test.png")},
    Ocr.RECOGNIZE_TYPE_TEXT, Ocr.OUTPUT_FORMAT_PLAINTEXT);
```

Barcode only:

```
String s = ocr.recognize(new File[] {new File("test.png")},
    Ocr.RECOGNIZE_TYPE_BARCODE, Ocr.OUTPUT_FORMAT_PLAINTEXT);
```

2.5.2 Perform OCR on part of the image

In some cases, you might not want to OCR the whole image. In that case, you can OCR on part of the image to save time:

```
String s = ocr.recognize("C:/test.png", -1, 0, 0, 400, 200,
Ocr.RECOGNIZE_TYPE_TEXT, Ocr.OUTPUT_FORMAT_PLAINTEXT);
```

The above code OCR the top left part of the image with width 400 pixels and height 200 pixels.

2.5.3 Perform OCR on multiple input files in one shot

You can perform OCR on multiple files in one shot:

```
String s = ocr.recognize("C:/test.png;C:/test2.jpg", -1, 0, 0, 400,
200, Ocr.RECOGNIZE_TYPE_TEXT, Ocr.OUTPUT_FORMAT_PLAINTEXT);
```

2.5.4 Perform OCR on a certain page from the specified TIFF file

A TIFF file may contain multiple pages. If you need to recognize only a certain page, you can specify the page number as following:

```
String s = ocr.recognize("C:/test.png", 2, -1, -1, -1, -1,
Ocr.RECOGNIZE_TYPE_TEXT, Ocr.OUTPUT_FORMAT_PLAINTEXT);
```

Note 2 means the second page (the page number of the first page is 1).

2.5.5 Perform OCR on a PDF input file

You use the following method to perform OCR on a PDF input file:

```
String s = ocr.recognize("C:/test.pdf", -1, 100, 100, 400, 200,
Ocr.RECOGNIZE_TYPE_TEXT, Ocr.OUTPUT_FORMAT_PLAINTEXT);
```

2.6 Multi-threading with Asprise OCR

Most of modern computers run on multi-core CPUs. Multi-threading can significantly reduce the runtime by making full use of the processor power. It is easy to do multi-threading with Asprise OCR.

You can implement thread pool pattern[1] by yourself with the *com.asprise.ocr.Ocr* class. Note that each thread must have its own dedicated OCR engine instance.

However, you do not need to start from scratch as Asprise OCR offer *com.asprise.ocr.OcrExecutorService* class that wraps OCR functionality in an executor service[2]. OcrExecutorService frees you from writing tricky thread management code.

Code sample:

```
OcrExecutorService oes =
  new OcrExecutorService("eng", Ocr.SPEED_FASTEST, 4); // 4 threads

List<Future<String>> futures = oes.invokeAll(Arrays.asList(
  new OcrExecutorService.OcrCallable(
    new File[] {new File("test1.png")},
      Ocr.RECOGNIZE_TYPE_ALL, Ocr.OUTPUT_FORMAT_XML),
  new OcrExecutorService.OcrCallable(
    new File[] {new File("test2.png")},
      Ocr.RECOGNIZE_TYPE_ALL, Ocr.OUTPUT_FORMAT_XML)
);

System.out.println("Result of test1.png: " + futures.get(0).get());
System.out.println("Result of test2.png: " + futures.get(1).get());

oes.shutdown(); // stops all OCR engines and disposes all threads
```

2.7 Software Packaging and Distribution

So you have successfully developed your Java applications with Asprise OCR. It's time to distribute your programs to end users. First, make sure you are an authorized licensee registered with Asprise. To purchase a license, please visit: http://www.asprise.com/product/ocr

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[1] http://en.wikipedia.org/wiki/Thread_pool_pattern

[2] http://docs.oracle.com/javase/1.5.0/docs/api/java/util/concurrent/ExecutorService.html

You need to distribute aocr.jar along with your other jar files.

3 Programming with Asprise OCR in C#

3.1 Asprise OCR for .NET Installation

First, make sure that you have already installed .NET framework version 4.0 or above on your system.

Download a copy of Asprise OCR SDK from http://www.asprise.com/product/ocr. Simply unzip it to an empty folder. Let refer this folder as OCR_ HOME.

The file organization of Asprise OCR SDK distribution is as follows:

```
OCR_HOME
+--- images [folder, containing sample image documents]
+--- sample-projects [sample .NET projects]
+--- aocr.dll, aocr_x64.dll [OCR dll]
+--- Asprise-OCR-SDK-Developers-Guide.pdf [This document]
```

3.2 Sample Projects

Sample projects show you how to invoke Asprise OCR functionalities using runnable code.

After you have obtained and unzipped the Asprise OCR SDK kit, you can open the sample projects using Visual Studio 2010 or later versions.
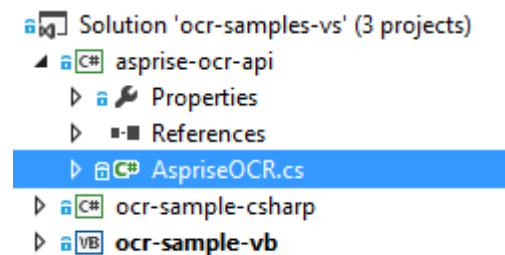
The **asprise-ocr-api** project is a library project that provides OCR API access for the .NET world. You can access it in any C# or Visual Basic project by simply adding a reference:

Running the C# sample project, you'll see the window as following:

Select an image and click the 'OCR' button to perform OCR.

3.3 Jump Start

The following code demonstrates the basic usage of Asprise OCR:

```
1    using asprise_ocr_api;
2
3    AspriseOCR.SetUp();
4    AspriseOCR ocr = new AspriseOCR();
5    ocr.StartEngine("eng", AspriseOCR.SPEED_FASTEST);
6
7    string s = ocr.Recognize("C:\\path\\img.jpg", -1, -1, -1, -1, -1,
         AspriseOCR.RECOGNIZE_TYPE_ALL,
         AspriseOCR.OUTPUT_FORMAT_PLAINTEXT);
```

```
8    // process more images here ...
9
10   ocr.StopEngine();
```

Line 3: performs one-time setup if it has not been done;

Lines 4 & 5: Creates a new Ocr engine that recognizes English in fastest speed setting; The evaluation version is able to recognize English (eng), Spanish (spa), Portuguese (por), German (deu) and French (fra). For other languages, for contact us.

Line 7: All the OCR work is done here. The *Recognize* method of the *AspriseOCR* class recognizes all the characters and barcodes from the image and output them as plain text. Other supported output formats are: XML (AspriseOCR.OUTPUT_FORMAT_XML) and searchable PDF(AspriseOCR.OUTPUT_FORMAT_PDF).

3.4 Input and Output

For the sample OCR code in above section, if the input is the figure below:
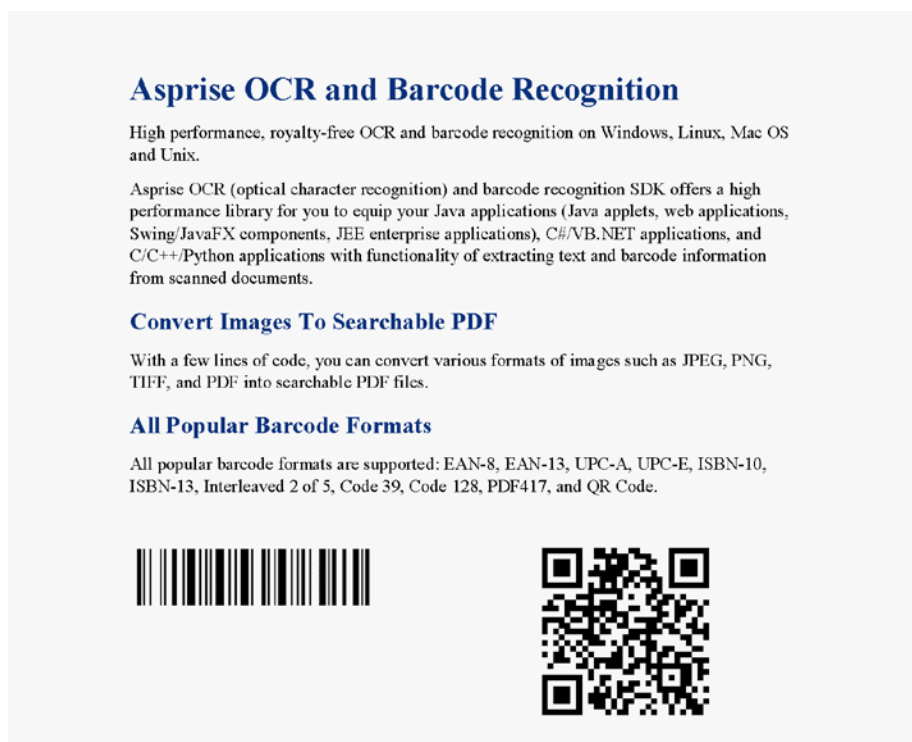
Then the output will be:

3.4.1 Plain-text Format

```
Asprise OCR and Barcode Recognition

High performance, royalty-free OCR and barcode recognition on Windows,
...
ISBN-13, Interleaved 2 of 5, Code 39, Code 128, PDF417, and QR Code.

[[QR-Code: www.asprise.com]]
[[CODE-128: Asprise]].
```

The last two lines represents bar code information extract. Note both the format and content of the barcode are enclosed in '[[ ]]' pairs.

3.4.2 XML Format

If you set the output format as OUTPUT_FORMAT_XML, you'll get:

```
<?xml version="1.0"?>
<asprise-ocr input="test.png">
  <page no="1" width="2400" height="3200" words="122"
confidence="88">
    <block type="text" x="321" y="254" width="1438" height="76"
words="5" confidence="86">
Asprise OCR and Barcode Recognition
    </block>
...
    <block type="barcode" subtype="QR-Code" x="1397" y="1484"
width="441" height="441" confidence="1">www.asprise.com</block>
    <block type="barcode" subtype="CODE-128" x="348" y="1489"
width="583" height="145" confidence="34">Asprise</block>
  </page>
</asprise-ocr>
```

Note that the coordinate information and confidence are available in the output.

3.4.3 PDF Format

If you set the output format as OUTPUT_FORMAT_PDF, you need specify the target output file as following:

```
string s = ocr.Recognize("C:\\path\\img.jpg", -1, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PDF,
AspriseOCR.PROP_PDF_OUTPUT_FILE, "C\\output.pdf",
AspriseOCR.PROP_PDF_OUTPUT_TEXT_VISIBLE, "true", // render in color
AspriseOCR.PROP_PDF_OUTPUT_IMAGE_FORCE_BW, "true");
```

Once the OCR done, you can open the PDF output file with any PDF viewer and perform searches:
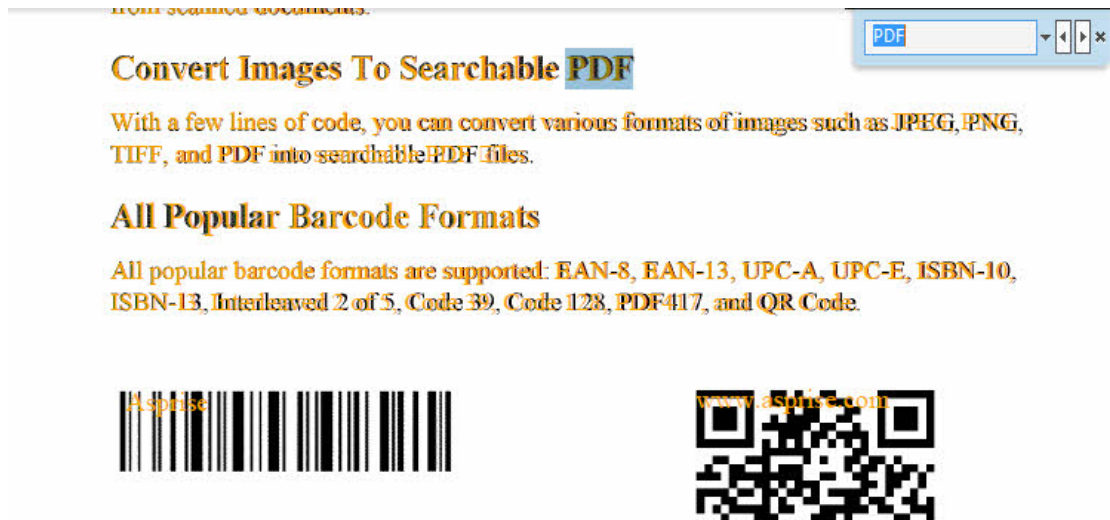
Note recognized text and barcodes are rendered in orange on top of the image. To make them transparent, you simply set:

```
AspriseOCR.PROP_PDF_OUTPUT_TEXT_VISIBLE, "false"
```

3.5 Other Usages

This section covers other essential functions offered by the AspriseOCR class.

3.5.1 Recognizes text only or barcode only

To save OCR time, you can choose to OCR text or barcode only:

Text only:

```
string s = ocr.Recognize("C:\\path\\img.jpg", -1, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_TEXT, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT);
```

Barcode only:

```
string s = ocr.Recognize("C:\\path\\img.jpg", -1, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_BARCODE,
AspriseOCR.OUTPUT_FORMAT_PLAINTEXT);
```

3.5.2 Perform OCR on part of the image

In some cases, you might not want to OCR the whole image. In that case, you can OCR on part of the image to save time:

```
string s = ocr.Recognize("C:\\path\\img.jpg", -1, 0, 0, 400, 200,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT);
```

The above code OCR the top left part of the image with width 400 pixels and height 200 pixels.

3.5.3 Perform OCR on multiple input files in one shot

You can perform OCR on multiple files in one shot:

```
string s = ocr.Recognize("C:\\img1.jpg;C:\\img2.png", -1, -1, -1, -1,
-1, AspriseOCR.RECOGNIZE_TYPE_ALL,
AspriseOCR.OUTPUT_FORMAT_PLAINTEXT);
```

3.5.4 Perform OCR on a certain page from the specified TIFF file

A TIFF file may contain multiple pages. If you need to recognize only a certain page, you can specify the page number as following:

```
string s = ocr.Recognize("C:\\img1.tif", 2, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT);
```

Note 2 means the second page (the page number of the first page is 1).

3.6 Multi-threading with Asprise OCR

Most of modern computers run on multi-core CPUs. Multi-threading can significantly reduce the runtime by making full use of the processor power. It is easy to do multi-threading with Asprise OCR.

You can implement thread pool pattern[3] by yourself or you can use Microsoft's default implementation of thread pooling[4]. Note that each thread must have its own dedicated OCR engine instance.

3.7 Software Packaging and Distribution

So you have successfully developed your C# applications with Asprise OCR. It's time to distribute your programs to end users. First, make sure you are an authorized licensee registered with Asprise. To purchase a license, please visit: http://www.asprise.com/product/ocr

You need to distribute aocr.dll along with your own binary code. Dll files should be put into one of the folders in system PATH.

---

[3] http://en.wikipedia.org/wiki/Thread_pool_pattern

[4] http://msdn.microsoft.com/en-us/library/h4732ks0.aspx

4 Programming with Asprise OCR in Visual Basic .NET

4.1 Asprise OCR for .NET Installation

First, make sure that you have already installed .NET framework version 4.0 or above on your system.

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The file organization of Asprise OCR SDK distribution is as follows:

```
OCR_HOME
+--- images [folder, containing sample image documents]
+--- sample-projects [sample .NET projects]
+--- aocr.dll, aocr_x64.dll [OCR dll]
+--- Asprise-OCR-SDK-Developers-Guide.pdf [This document]
```

4.2 Sample Projects

Sample projects show you how to invoke Asprise OCR functionalities using runnable code.

After you have obtained and unzipped the Asprise OCR SDK kit, you can open the sample projects using Visual Studio 2010 or later versions.
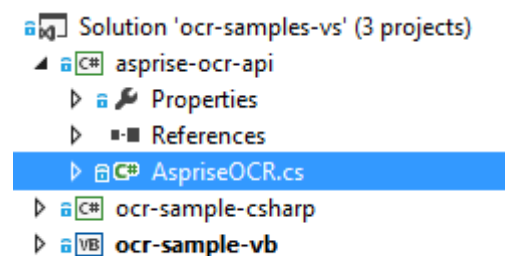
The **asprise-ocr-api** project is a library project that provides OCR API access for the .NET world. You can access it in any C# or Visual Basic project by simply adding a reference:

Running the C# sample project, you'll see the window as following:

Select an image and click the 'OCR' button to perform OCR.

4.3 Jump Start

The following code demonstrates the basic usage of Asprise OCR:

```
1    Imports asprise_ocr_api
2
3    Private ocr As AspriseOCR
4
5    AspriseOCR.SetUp()
6    ocr = New AspriseOCR()
7    ocr.StartEngine("eng", AspriseOCR.SPEED_FASTEST)
8
```

```
9   Dim s As String = ocr.Recognize("C:\\img.jpg", -1, -1, -1, -1, -1,
       AspriseOCR.RECOGNIZE_TYPE_ALL,
       AspriseOCR.OUTPUT_FORMAT_PLAINTEXT)
10  ' process more images here ...
11
12  ocr.StopEngine()
```

Line 5: performs one-time setup if it has not been done;

Lines 6 & 7: Creates a new Ocr engine that recognizes English in fastest speed setting; The evaluation version is able to recognize English (eng), Spanish (spa), Portuguese (por), German (deu) and French (fra). For other languages, for contact us.

Line 9: All the OCR work is done here. The *Recognize* method of the *AspriseOCR* class recognizes all the characters and barcodes from the image and output them as plain text. Other supported output formats are: XML (AspriseOCR.OUTPUT_FORMAT_XML) and searchable PDF(AspriseOCR.OUTPUT_FORMAT_PDF).

4.4 Input and Output

For the sample OCR code in above section, if the input is the figure below:
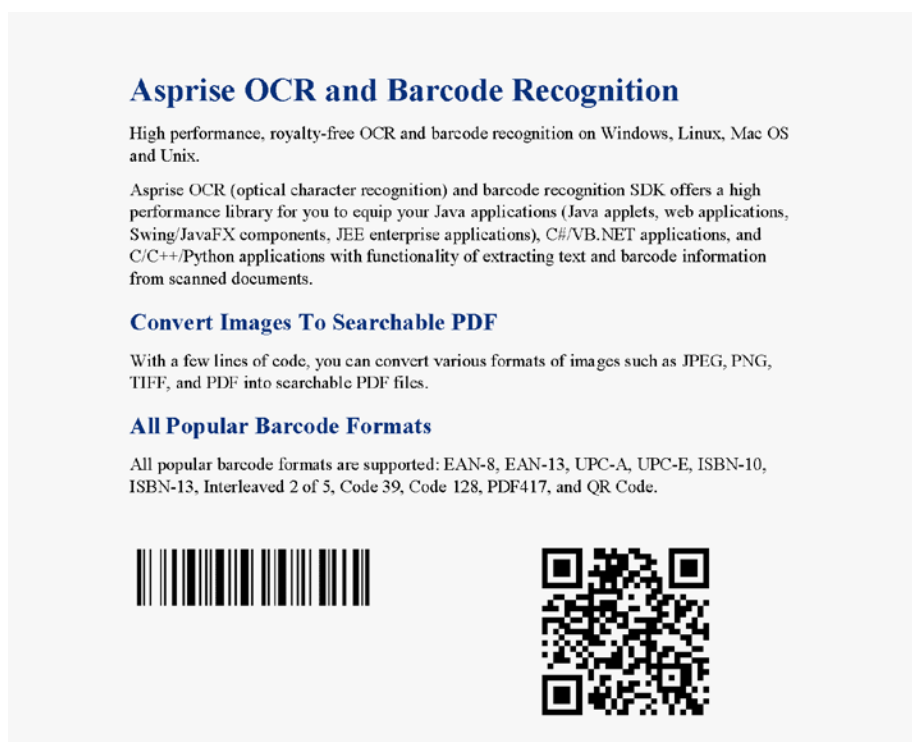
Then the output will be:

4.4.1 Plain-text Format

```
Asprise OCR and Barcode Recognition

High performance, royalty-free OCR and barcode recognition on Windows,
...
ISBN-13, Interleaved 2 of 5, Code 39, Code 128, PDF417, and QR Code.

[[QR-Code: www.asprise.com]]
[[CODE-128: Asprise]].
```

The last two lines represents bar code information extract. Note both the format and content of the barcode are enclosed in '[[ ]]' pairs.

4.4.2 XML Format

If you set the output format as OUTPUT_FORMAT_XML, you'll get:

```
<?xml version="1.0"?>
<asprise-ocr input="test.png">
  <page no="1" width="2400" height="3200" words="122"
confidence="88">
    <block type="text" x="321" y="254" width="1438" height="76"
words="5" confidence="86">
Asprise OCR and Barcode Recognition
    </block>
...
    <block type="barcode" subtype="QR-Code" x="1397" y="1484"
width="441" height="441" confidence="1">www.asprise.com</block>
    <block type="barcode" subtype="CODE-128" x="348" y="1489"
width="583" height="145" confidence="34">Asprise</block>
  </page>
</asprise-ocr>
```

Note that the coordinate information and confidence are available in the output.

4.4.3 PDF Format

If you set the output format as OUTPUT_FORMAT_PDF, you need specify the target output file as following:

```
s = ocr.Recognize("C:\\img.jpg", -1, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PDF,
AspriseOCR.PROP_PDF_OUTPUT_FILE, "C\\output.pdf",
AspriseOCR.PROP_PDF_OUTPUT_TEXT_VISIBLE, "true", // render in color
AspriseOCR.PROP_PDF_OUTPUT_IMAGE_FORCE_BW, "true")
```

Once the OCR done, you can open the PDF output file with any PDF viewer and perform searches:
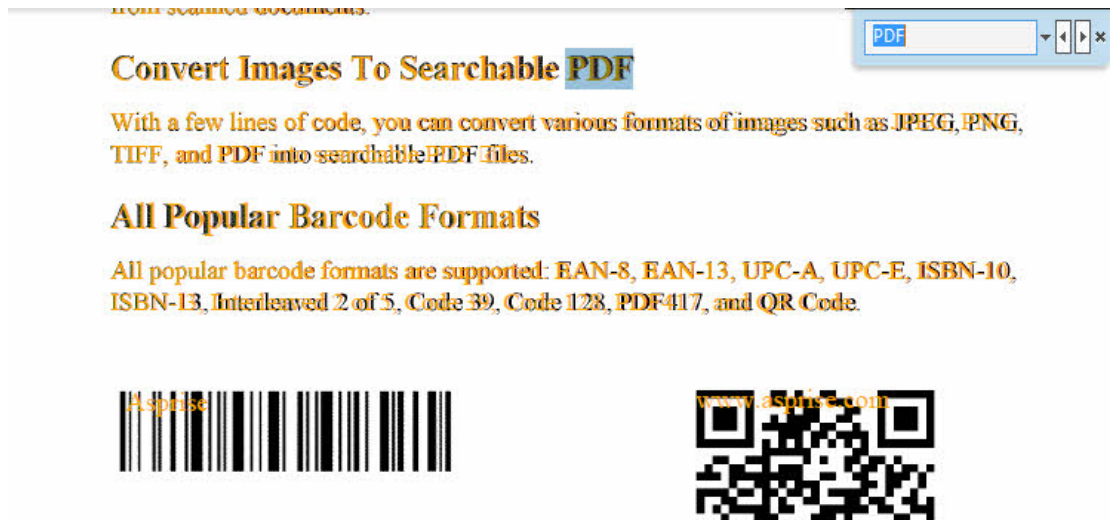
Note recognized text and barcodes are rendered in orange on top of the image. To make them transparent, you simply set:

```
AspriseOCR.PROP_PDF_OUTPUT_TEXT_VISIBLE, "false"
```

4.5 Other Usages

This section covers other essential functions offered by the AspriseOCR class.

4.5.1 Recognizes text only or barcode only

To save OCR time, you can choose to OCR text or barcode only:

Text only:

```
s = ocr.Recognize("C:\\img.jpg", -1, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_TEXT, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT)
```

Barcode only:

```
s = ocr.Recognize("C:\\img.jpg", -1, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT)
```

4.5.2 Perform OCR on part of the image

In some cases, you might not want to OCR the whole image. In that case, you can OCR on part of the image to save time:

```
s = ocr.Recognize("C:\\img.jpg", -1, 0, 0, 400, 200,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT)
```

The above code OCR the top left part of the image with width 400 pixels and height 200 pixels.

4.5.3 Perform OCR on multiple input files in one shot

You can perform OCR on multiple files in one shot:

```
s = ocr.Recognize("C:\\img.jpg;C:\\2.jpg", -1, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT)
```

4.5.4 Perform OCR on a certain page from the specified TIFF file

A TIFF file may contain multiple pages. If you need to recognize only a certain page, you can specify the page number as following:

```
s = ocr.Recognize("C:\\img.tif", 2, -1, -1, -1, -1,
AspriseOCR.RECOGNIZE_TYPE_ALL, AspriseOCR.OUTPUT_FORMAT_PLAINTEXT)
```

Note 2 means the second page (the page number of the first page is 1).

4.6 Multi-threading with Asprise OCR

Most of modern computers run on multi-core CPUs. Multi-threading can significantly reduce the runtime by making full use of the processor power. It is easy to do multi-threading with Asprise OCR.

You can implement thread pool pattern[5] by yourself or you can use Microsoft's default implementation of thread pooling[6]. Note that each thread must have its own dedicated OCR engine instance.

4.7 Software Packaging and Distribution

So you have successfully developed your Visual Basic .NET applications with Asprise OCR. It's time to distribute your programs to end users. First, make sure you are an authorized licensee registered with Asprise. To purchase a license, please visit: http://www.asprise.com/product/ocr

You need to distribute aocr.dll along with your own binary code. Dll files should be put into one of the folders in system PATH.

---

[5] http://en.wikipedia.org/wiki/Thread_pool_pattern

[6] http://msdn.microsoft.com/en-us/library/h4732ks0.aspx

5   Support and Professional Services

5.1 Support Web Site

http://www.asprise.com/product/ocr

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5.4 Professional Services

We provide custom professional services such as software integration, OCR font training, etc.

6   Appendix: Java Image Acquisition Components

The image acquisition UI components are not part of Asprise OCR library. However, based on our customers' experience, if you need to build a front-end for OCR, they are invaluable and could save you a lot of time. Otherwise, you may skip this chapter.

6.1 JImageDialog

JImageDialog is an image acquisition UI component that allows the user to load images and to perform basic image editing tasks. If you are developing some applications that require the user to select/edit/input images, then JImageDialog will make your life extremely easy – and more importantly, the user experience will be improved dramatically.

Let say you want to build an album application, the user is required to supply photos (i.e. images). You put a button on your panel. When the user click the button, JImageDialog is brought up – now the user can select existing pictures files from his or her computer or acquire images from digital cameras or scanners. And the user can edit images before putting it into the album.

6.1.1 Advantages

♦ Multiple image sources supported: local computer, digital cameras, scanners and the web;
♦ Multiple image formats: read and write BMP, PNG, JPG, GIF, PCT, PSD and many other formats;
♦ Platform/Virtual machine independent: Any platform, any Java virtual machine (version 1.3 or above);
♦ Powerful features: rotation, flipping, scaling, clipping, etc.
♦ User friendly as well as developer friendly

The user can load images from local computer or the web, he or she can also acquire images from digital cameras and scanners. After the image has been loaded, the user can rotate, clip, flip, and scale the image. The image has been loaded and edited, the user can save the image or select the image - which will be used in your applications.

6.1.2 Sample Uses

Modal (synchronous) mode

```
1.  JImageDialog dialog = new JImageDialog(frame, "Sample", true);
    // Modal dialog
2.  BufferedImage image = dialog.showDialog();
3.  ...
```

Line 1 constructs the image dialog.

Line 2 brings up the image dialog and waiting for user's selection/acquisition.

Besides using JImageDialog in synchronous mode, you can also use it in:

Asynchronous mode

```
1   public class JImageDialogSample extends JPanel implements
      JImageDialogListener {
2     ...
3   BufferedImage image;
4
5   // Displays selected image if any.
6   public void paintComponent(Graphics g) {
7       super.paintComponent(g); // Paint background.
8       if(image != null)
9           g.drawImage(image, 0, 0, null);
10  }
11
12  // Sets image and refreshes the panel.
13      public void setImage(BufferedImage image) {
14      this.image = image;
15    setPreferredSize(getPreferredSize());
16      revalidate();
17      repaint();
18  }
19
20  // Methods in JImageDialogListener
21  // When the user presses cancel button, this method will be
      called.
22  public void onCancel() {
23      setImage(null);
24    }
25
26  // When the user presses the selection button, will be invoked.
27  public void onImageSet(BufferedImage image) {
28      setImage(image);
29  }
30  }
31
32  ...
33  JImageDialogSample imagePanel = new JImageDialogSample();
34
35  JImageDialog dialog = new JImageDialog();
36  dialog.addImageDialogListener(imagePanel);
37  dialog.showDialog();
```

Line 1-30 implements a *JimageDialogListener*.

Line 33 constructs the listener.

Line 35 constructs the dialog.

Line 36 registers the listener the dialog

Line 37 brings up the dialog

When the user acquires an image and selects it, JImageDialog's listeners will be notified. In this case, *imagePanel.onImageSet(BufferedImage image)* will be called and thus the panel will display the selected image. If the user cancels the selection, *onCancel()* will be called instead.

Sample application: *com.asprise.util.ui.JImageDialogSample*

6.1.3 Supported Image Formats

The following table shows image formats supported by JImageDialog:

Formats	File extensions	READ	WRITE
Adobe Photoshop	*.psd	Y	Y
Bitmap, Windows/OS2	*.bmp, *.dib	Y	Y
Cursor	*.cur	Y	
Graphics Interchange Format	*.gif	Y	
Icon	*.ico	Y	
JPEG	*.jpg, *.jpeg	Y	Y
Macintosh PICT Format	*.pict, *.pct	Y	Y
PCX Format	*.pcx	Y	Y
Portable Network Graphics	*.png	Y	Y
Sun Raster Format	*.ras	Y	
Tag Image File Format	*.tif, *tiff	Y	
Targa	*.tga	Y	Y
X Bitmap	*.xbm	Y	Y
X PixMap	*.xpm	Y	Y

On any Java platforms (version 1.3 or above), JImageDialog supports the above formats (using its own library to read/write image files). JImageDialog intelligently selects the best way to read or write files – e.g. on Java 1.4, it may invoke *ImageIO* to

see whether a file can be read or written; if the ImageIO can do the job then JImageDialog will let it do; otherwise, JImageDialog will use its own library to access the file.

Note: You can only read/write image files from the JImageDialog UI component with unlicensed image acquisition UI component package. If you want to access image files from your Java code and/or to perform other advanced operations, you need to obtain an affordable license from LAB Asprise!.

6.1.4 Compatibility

All Java runtimes with version 1.3 or above.

6.1.5 Software Packaging and Distribution

Mandatory: *jid.jar, JTwain.jar*

6.2 JImageFileChooser

JImageFileChooser is an extended *JFileChooser* that supports image preview and image information extraction.
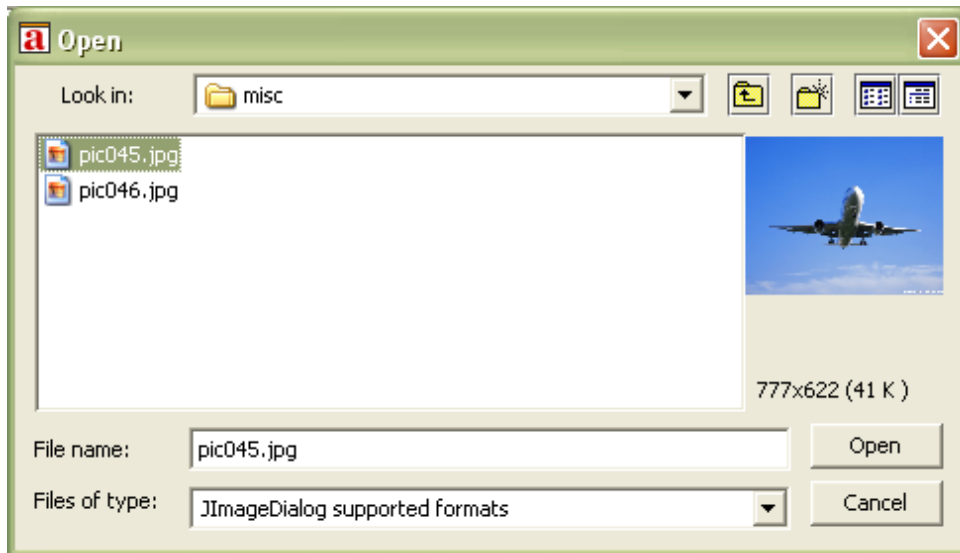
When the user clicks an image file, its preview and associated information will be displayed to assist the user to select the proper image.

6.2.1 Sample Use

```
1    JFileChooser fc = new JImageFileChooser(lastDirectory);
2    fc.addChoosableFileFilter(JImageFileChooser.getImageFileFilter());
3    int returnVal = fc.showOpenDialog(frame);
4    ...
```

Line 1 creates the image file chooser;

Line 2 set the file filter.

You can use it as normal JFileChooser, and it improves the user experience greatly.

6.2.2 Supported Image Formats

Please refer to Supported Image Formats in JImageDialog section.

Note: You can only preview image files from the JImageFileChooser UI component with unlicensed image acquisition UI component package. If you want to read/write

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6.2.3 Compatibility

All operating systems; All Java runtimes with version 1.2 or above.

6.2.4 Software Packaging and Distribution

Mandatory: **jid.jar**

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For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived

from the library, whereas the latter must be combined with the library in order to run.

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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

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c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.
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It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

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zlib.h -- interface of the 'zlib' general purpose compression library
  version 1.2.8, April 28th, 2013

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