

path.cm

```
/*  
  
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    )  
  
*/  
  
// Copyright (c) 1994  
// Hewlett-Packard Company  
// Copyright (c) 1996  
// Silicon Graphics Computer Systems, Inc.  
// Copyright (c) 2009 Alexander Stepanov and Paul McJones  
  
using System;  
using System.Collections;  
  
namespace System.IO  
{  
    public class InvalidPathException: Exception  
    {  
        public InvalidPathException(const string& message_): base(  
            message_)  
        {  
        }  
        public default InvalidPathException(const InvalidPathException&);  
    }  
  
    public string GetCurrentWorkingDirectory()  
    {  
        IOBuffer buffer(4096u);  
        char* wd = get_current_working_directory(cast<char*>(buffer.Mem()  
            ), cast<int>(buffer.Size()));  
        if (wd != null)  
        {  
            return Path.MakeCanonical(wd);  
        }  
        else  
        {  
            throw IOException("could not get current working directory");  
        }  
    }  
  
    public nothrow bool FileExists(const string& filePath)  
    {  
        return file_exists(filePath.Chars()) != 0;  
    }  
}
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}

public nothrow bool DirectoryExists(const string& directoryPath)
{
    return directory_exists(directoryPath.Chars()) != 0;
}

public nothrow bool PathExists(const string& path)
{
    return path_exists(path.Chars()) != 0;
}

public bool LastWriteTimeLess(const string& filePath1, const string&
filePath2)
{
    int result = last_write_time_less(filePath1.Chars(), filePath2.
Chars());
    if (result == -1)
    {
        string reason = strerror(get_errno());
        throw IOException("could not get last write time for file '"
+ filePath1 + "' : " + reason);
    }
    else if (result == -2)
    {
        string reason = strerror(get_errno());
        throw IOException("could not get last write time for file '"
+ filePath2 + "' : " + reason);
    }
    return result != 0;
}

public void CreateDirectories(const string& directoryPath)
{
    string path = GetFullPath(directoryPath);
    List<string> directoriesToCreate;
    while (!DirectoryExists(path))
    {
        directoriesToCreate.Add(path);
        path = Path.GetParent(directoryPath);
    }
    int n = directoriesToCreate.Count();
    for (int i = n - 1; i >= 0; --i)
    {
        const string& directory = directoriesToCreate[i];
        int result = create_directory(directory.Chars());
    }
}

public void RemoveFile(const string& filePath)
{
    int result = remove(filePath.Chars());
    if (result != 0)

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    {
        string reason = strerror(get_errno());
        throw IOException("could not remove file '" + filePath + "':
            " + reason);
    }
}

public static class Path
{
    public static string MakeCanonical(const string& path)
    {
        string result;
        char prev = ' ';
        for (char c : path)
        {
            if (c == '\\')
            {
                c = '/';
            }
            if (c == '/')
            {
                if (prev != '/')
                {
                    result.Append(c);
                }
            }
            else
            {
                result.Append(c);
            }
            prev = c;
        }
        if (result.Length() == 3 && IsAlpha(result[0]) && result[1]
            == ':' && result[2] == '/')
        {
            return result;
        }
        if (result == "/")
        {
            return result;
        }
        if (!result.IsEmpty())
        {
            if (result[result.Length() - 1] == '/')
            {
                result.Substring(0, result.Length() - 1);
            }
        }
        return result;
    }
    public static nothrow string ChangeExtension(const string& path,
        const string& extension)
    {

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int lastDotPos = path.RFind( '.' );
if (extension.IsEmpty())
{
    if (lastDotPos != -1)
    {
        return path.Substring(0, lastDotPos);
    }
    else
    {
        return path;
    }
}
else
{
    if (lastDotPos == -1)
    {
        #assert(!extension.IsEmpty());
        if (extension[0] == '.')
        {
            return path + extension;
        }
        else
        {
            return path + "." + extension;
        }
    }
    else
    {
        if (extension[0] == '.')
        {
            return path.Substring(0, lastDotPos) + extension;
        }
        else
        {
            return path.Substring(0, lastDotPos + 1) +
                extension;
        }
    }
}
}

public static bool HasExtension(const string& path)
{
    string p = MakeCanonical(path);
    int lastDotPos = p.RFind( '.' );
    if (lastDotPos != -1)
    {
        int lastColon = p.Find( ':', lastDotPos + 1);
        int lastDirSep = p.Find( '/', lastDotPos + 1);
        if (lastColon > lastDotPos || lastDirSep > lastDotPos)
        {
            return false;
        }
        else if (lastDotPos < p.Length() - 1)

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        {
            return true;
        }
        else
        {
            return false;
        }
    }
    else
    {
        return false;
    }
}

public static string GetExtension(const string& path)
{
    string p = MakeCanonical(path);
    int lastDotPos = p.RFind('.');
    if (lastDotPos != -1)
    {
        if (p.Find('/', lastDotPos + 1) != -1)
        {
            return string();
        }
        else
        {
            return p.Substring(lastDotPos);
        }
    }
    else
    {
        return string();
    }
}

public static string GetFileName(const string& path)
{
    if (path.IsEmpty())
    {
        return string();
    }
    else
    {
        string p = MakeCanonical(path);
        char lastChar = p[p.Length() - 1];
        if (lastChar == '/' || lastChar == ':')
        {
            return string();
        }
        else
        {
            int lastDirSepPos = p.RFind('/');
            if (lastDirSepPos != -1)
            {
                return p.Substring(lastDirSepPos + 1);
            }
        }
    }
}

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        }
        else
        {
            return p;
        }
    }
}

public static string GetFileNameWithoutExtension(const string&
path)
{
    string fileName = GetFileName(path);
    int lastDotPos = fileName.RFind('.');
    if (lastDotPos != -1)
    {
        return fileName.Substring(0, lastDotPos);
    }
    else
    {
        return fileName;
    }
}

public static string GetDirectoryName(const string& path)
{
    string p = MakeCanonical(path);
    if (p.IsEmpty())
    {
        return string();
    }
    else if (p.Length() == 3 && IsAlpha(p[0]) && p[1] == ':' && p
[2] == '/')
    {
        return string();
    }
    else
    {
        int lastDirSepPos = p.RFind('/');
        if (lastDirSepPos != -1)
        {
            return p.Substring(0, lastDirSepPos);
        }
        else
        {
            return string();
        }
    }
}

public static string Combine(const string& path1, const string&
path2)
{
    string p1 = MakeCanonical(path1);
    string p2 = MakeCanonical(path2);
    if (p1.IsEmpty())

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    {
        return p2;
    }
    else if (p2.IsEmpty())
    {
        return p1;
    }
    else
    {
        if (IsAbsolute(p2))
        {
            return p2;
        }
        else
        {
            string result = p1;
            #assert(!result.IsEmpty());
            if (result[result.Length() - 1] != '/')
            {
                result.Append('/');
            }
            result.Append(p2);
            return result;
        }
    }
}

public static bool IsAbsolute(const string& path)
{
    if (path.IsEmpty())
    {
        return false;
    }
    else
    {
        string p = MakeCanonical(path);
        if (p[0] == '/')
        {
            return true;
        }
        else if (IsAlpha(p[0]) && p.Length() > 2 && p[1] == ':' && p[2] == '/')
        {
            return true;
        }
        else
        {
            return false;
        }
    }
}

public static bool IsRelative(const string& path)
{
    return !IsAbsolute(path);
}

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    }
    public static string GetParent(const string& path)
    {
        string fullPath = GetFullPath(path);
        int lastSlashPos = fullPath.RFind('/');
        return fullPath.Substring(0, lastSlashPos);
    }
}

public string GetFullPath(const string& path)
{
    string cp = Path.MakeCanonical(path);
    string p = cp;
    if (Path.IsRelative(p))
    {
        p = GetCurrentWorkingDirectory();
        p.Append('/');
        p.Append(cp);
    }
    List<string> components = p.Split('/');
    int w = 0;
    int n = components.Count();
    for (int i = 0; i < n; ++i)
    {
        const string& c = components[i];
        if (i == 0 || (!c.IsEmpty() && c != "."))
        {
            if (c == "..")
            {
                --w;
                if (w < 0)
                {
                    throw InvalidPathException("path '" + path + "'
                        is invalid");
                }
            }
            else
            {
                if (w != i)
                {
                    components[w] = components[i];
                }
                ++w;
            }
        }
    }
    if (w == 0)
    {
        return "/";
    }
    else if (w == 1)
    {
        const string& p = components[0];

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        if (p.Length() == 2 && IsAlpha(p[0]) && p[1] == ':')
        {
            return p + "/";
        }
    }
    string result;
    for (int i = 0; i < w; ++i)
    {
        if (i != 0)
        {
            result.Append('/');
        }
        result.Append(components[i]);
    }
    return result;
}
}

```