Comp151 Lab
Documentation using Doxygen

Supplementary Notes
By Adam

Information in this slide is extracted from Doxygen homepage:
http://www.stack.nl/~dimitri/doxygen/
and Javadoc reference:
http://java.sun.com/j2se/javadoc/writingdoccomments/

Introduction

- Doxygen is a documentation system for C++, C, Java, Objective-C, Python, IDL (Corba and Microsoft flavors) and to some extent PHP, C#, and D.
- It can generate documentations in HTML or LATEX format from a set of documented source files. There is also support for generating output in RTF (MS-Word), PostScript, hyperlinked PDF, compressed HTML, and Unix man pages.
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Documenting the source code

Hello.hpp

```
/** \file hello.hpp
 *  Descriptions about this file.
 */
#include <iostream>
…
/**
 *  \class hello
 *  \author  Helloman
 *  \brief  This is a brief description
 *
 *  Here is some detail descriptions.
 */
class hello {
public:
    int index; //!< This is a data member
    …
    /**
     *  \brief  This is a brief description for print()
     */
    void print (String txt //!< This is a parameter
          );
};
```

- Documentations are written inside comment blocks with special indicators, e.g. /** and */ or //!<.
- They are usually placed before definition or declarations, although they can be put in other places.
- Doxygen will collect them and generate appropriate documentations.

Documentation for class

```
/**
 * \class CosFunc.
 * \brief A class derived from Func to implement cosine function.
 */
class CosFunc: public Func {…};
```

- \class and \brief are special commands. Special commands can start with “\” or “@”.
- They tell Doxygen how to handle a piece of information.

\class

- \class <name>
  - Indicates that a comment block contains documentation for a class.
  - You can omit this one if the block is right before the definition of a class.
- In writing documentation, you can omit the subject and simply state the object. That will make it easier to read, e.g.
  - “This class is the base class of all function classes.” We can use “The base class of all function classes.” instead.
- The class inheritance hierarchy diagram will be automatically generated by Doxygen.

\brief

- \brief { brief description }
  - Starts a paragraph that serves as a brief description. It ends when a blank line or another sectioning command is encountered.
  - If multiple \brief commands are present they will be joined.
  - Detailed description can be put after \brief separated by a blank line.
- It can be used in many kinds of documentation blocks, e.g. blocks for classes, functions or files
- You can use phrases instead of complete sentences in writing \brief, e.g. “To create a cosine function.”

\brief (con’t)

- Question:

  If I write documentation blocks for an element in both header and source file, which one will be used?

- For \brief,
  - only the one before the *declaration* will be used. (usually in the header file)

- For detailed description,
  - the one before *definition* is preferred and the other one will be ignored. (usually in the source file)

lab07: CosFunc Class Reference - Microsoft Internet Explorer

File Edit View Favorites Tools Help

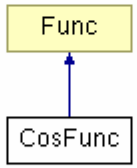
Main Page | Namespace List | Class Hierarchy | Class List | File List | Class Members | File Members | Related Pages

CosFunc Class Reference

A class derived from **Func** to implement cosine function. More...

```
#include <tri_func.hpp>
```

Inheritance diagram for CosFunc:



Class Inheritance Hierarchy Diagram

List of all members.

Public Member Functions

	CosFunc (double _scale=1.00) *To create a cosine function.*
double	**EvaluateAt** (double d) const *Evaluate the function at d.*
double	**DerivativeAt** (double d) const *Calculate the derivative value of a function at d.*

Sentences after \brief will be displayed here.

My Computer

Documentation for function

```
/**
 * \brief Evaluate the function at d.
 *
 * \return a function value
 */
double EvaluateAt(double d   //!< value in the domain
                  ) const;
```

- \return { description of the return value }
  - Starts a return value description for a function.
  - Like \brief, the \return description ends when a blank line or some other sectioning command is encountered.

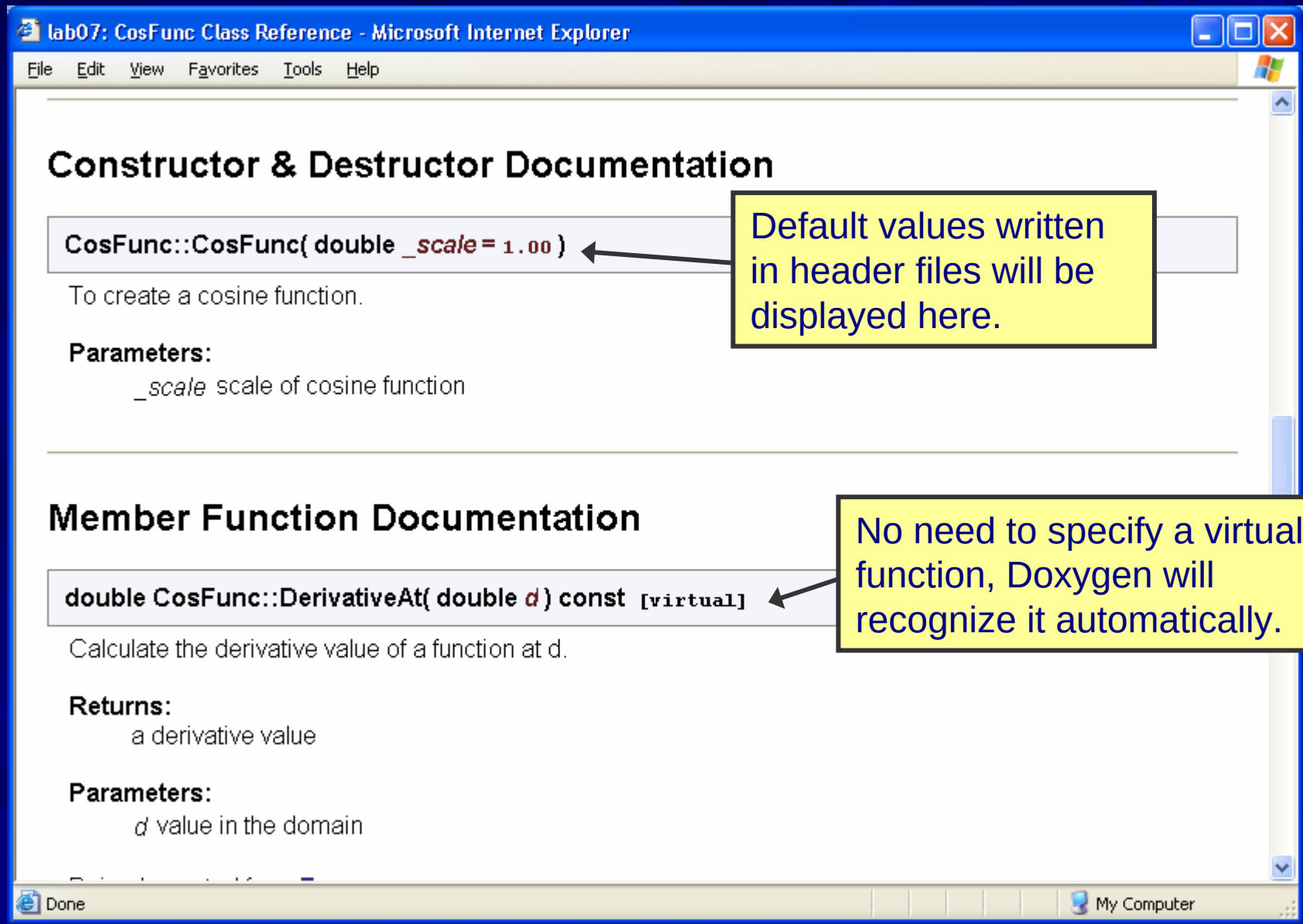
\return

- You can omit \return for methods that return “void” and for constructors.
  - But include it for all other methods, even if its content is entirely redundant. That will make it easier for someone to find the return value quickly.
- Whenever possible, supply return values for special cases, e.g.
  - specifying the value returned when an out-of-bounds argument is supplied.

Parameters

```
double EvaluateAt( double d     //!< value in the domain
                                ) const;
…
double scale;      //!< Scale of the cosine function
```

- When documenting the members of a class, or parameters of a function:
  - It is desired to place the documentation block after the member instead of before.
  - For this purpose you have to put an additional < marker in the comment block, i.e. “//!<“


lab07: CosFunc Class Reference - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Constructor & Destructor Documentation
CosFunc::CosFunc(double _scale = 1.00)
To create a cosine function.
Parameters:
_scale scale of cosine function
Default values written in header files will be displayed here.
Member Function Documentation
double CosFunc::DerivativeAt(double d) const [virtual]
Calculate the derivative value of a function at d.
Returns:
a derivative value
Parameters:
d value in the domain
No need to specify a virtual function, Doxygen will recognize it automatically.
Done
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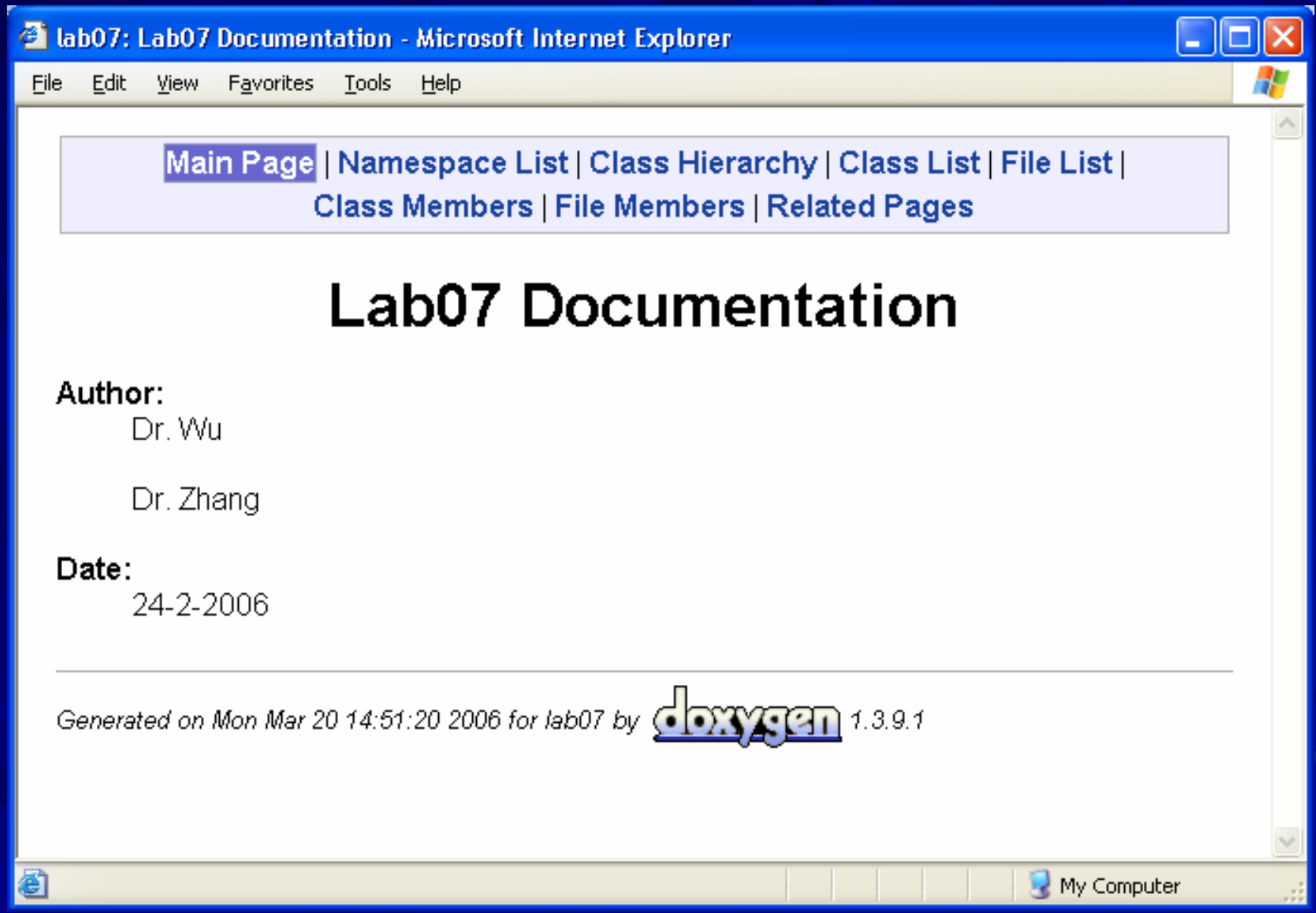
Documentation for main page

```
/**
 * \mainpage Lab07 Documentation
 *
 * \author  Dr. Wu
 * \author  Dr. Zhang
 * \date    24-2-2006
 */
```

- \mainpage [(title)]
  - It is used to customize the index page.
  - Title argument is optional and replaces the default title that Doxygen normally generates (the one you specified in doxygen.config).
  - You can put it before a class or above the main().
- \author, \date and some related commands can also be used in other documentation blocks.


lab07: Lab07 Documentation - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Main Page | Namespace List | Class Hierarchy | Class List | File List |
Class Members | File Members | Related Pages
Lab07 Documentation
Author:
Dr. Wu
Dr. Zhang
Date:
24-2-2006
Generated on Mon Mar 20 14:51:20 2006 for lab07 by doxygen 1.3.9.1
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Suggested order for a list of commands

- \brief
- \param
- \return
- \exception
- \author
- \version
- \date
- \see
- \since
- \bug
- \warning

Other useful commands

- \note { text }
  - Starts a paragraph where a note can be entered. The paragraph will be indented.
  - A “Note: “ will appear in the documentation before the text.
  - E.g. *note* Impulse function is differentiable except at the impulse

- \par [(paragraph title)] { paragraph }
  - If a paragraph title is given this command starts a paragraph with a user defined heading.
  - The paragraph following the command will be indented.
  - E.g

    par Format:

    name = sin \n

    is periodic = true \n

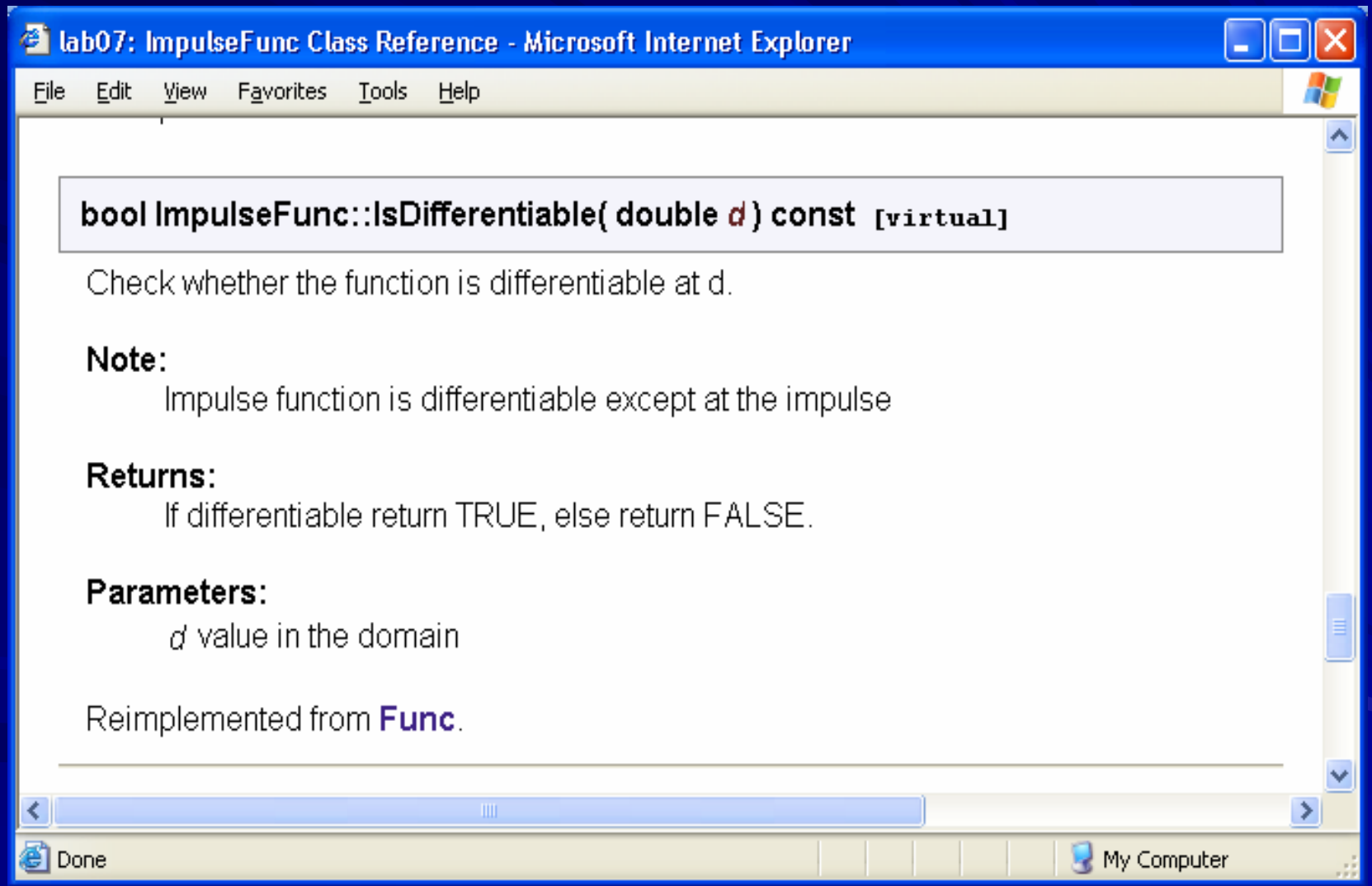
    …

Other useful commands (con't)

- \n
  - Forces a new line. Equivalent to
 and inspired by the printf function.
  - If no \n, new-lines, tabs and spaces will be trimmed to a single space in the documentation.

- There are other commands for formatting, e.g.
  - \b (bold)
  - \e (italic)
  - \c (type writer)

\note


lab07: ImpulseFunc Class Reference - Microsoft Internet Explorer
File Edit View Favorites Tools Help
bool ImpulseFunc::IsDifferentiable(double d) const [virtual]
Check whether the function is differentiable at d.
Note:
Impulse function is differentiable except at the impulse
Returns:
If differentiable return TRUE, else return FALSE.
Parameters:
d value in the domain
Reimplemented from Func.
Done
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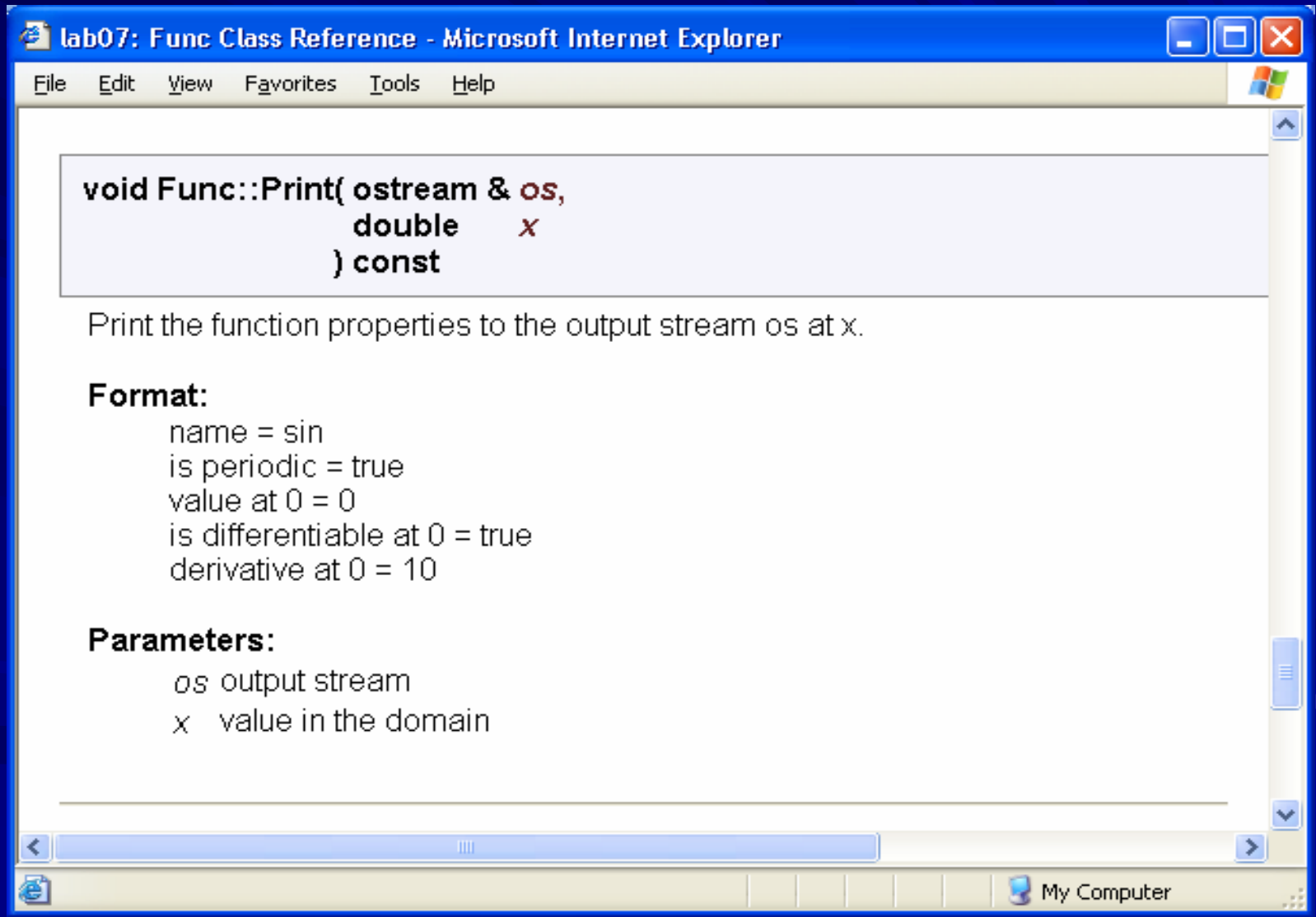
\par and \n


lab07: Func Class Reference - Microsoft Internet Explorer
File Edit View Favorites Tools Help
void Func::Print(ostream & os,
double x
) const
Print the function properties to the output stream os at x.
Format:
name = sin
is periodic = true
value at 0 = 0
is differentiable at 0 = true
derivative at 0 = 10
Parameters:
os output stream
x value in the domain
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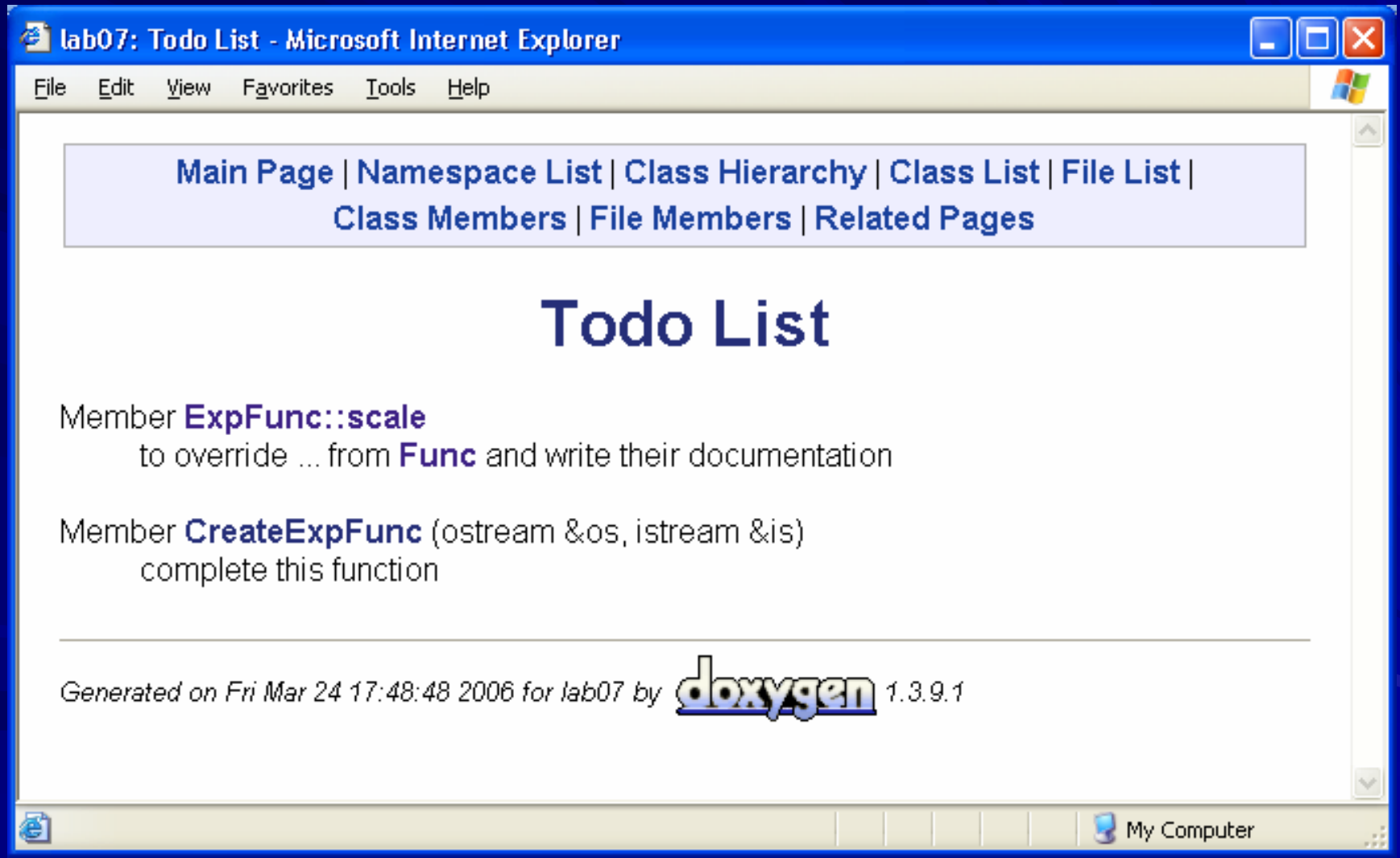
Other useful commands (con't)

- \todo { paragraph describing what is to be done }
  - Starts a paragraph where a TODO item is described.
  - The description will also add an item to a separate TODO list.
  - Those descriptions will be cross-referenced.

- You can find a TODO list in the "Related Pages" of the lab7 documentation.

- You can find other Doxygen commands here:
  - Online reference for special commands:
    - http://www.stack.nl/~dimitri/doxygen/commands.htm

\todo


lab07: Todo List - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Main Page | Namespace List | Class Hierarchy | Class List | File List |
Class Members | File Members | Related Pages
Todo List
Member ExpFunc::scale
to override ... from Func and write their documentation
Member CreateExpFunc (ostream &os, istream &is)
complete this function
Generated on Fri Mar 24 17:48:48 2006 for lab07 by doxygen 1.3.9.1
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