mcmthesis 文档类 v6.3.2* → English Version

LaTeXStudio

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摘要

这份模板是美国大学生数学建模竞赛（MCM/ICM）的论文模板。模板遵循赛事官方的要求，设置了页眉页脚、字体和摘要页等内容。本文档对模板的使用做出了说明。

1 模板介绍

这份模板最早由 latexstudio 设计，并在往年参赛者的建议下不断改进。2014 年年初，黄晨成接手模板，用 key-value 语法重构了文档选项，并修复了一些 bug。2015 年年初，黄晨成将模板使用 DocStrip 的语法重构，并上传至 CTAN。

详细的使用说明，可以参考这里。我们也会持续维护更新在这里，大家可以到这里下载 `https://www.latexstudio.net`。

2 手工安装说明

2.1 下载

你可以到项目主页下载模板的最新版本。除去项目主页之外，不再维护任何镜像。

CTAN `http://www.ctan.org/pkg/mcmthesis`

GitHub `https://github.com/latexstudio-org/mcmthesis`

LaTeXStudio `https://www.latexstudio.net`

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*这份文档是 mcmthesis v6.3.2 的说明文档，更新日期 2024/01/15。

此外，文档类也已上传至 CTAN，你可以在 TEX Live 等发行版的宏包管理器中下载。

2.2 安装

我们以 SOURCE 代表你下载的源文件目录，在终端下执行以下命令。

```
cd SOURCE
xetex mcmthesis.dtx
xelatex mcmthesis.dtx
xelatex mcmthesis.dtx
xelatex mcmthesis-demo.tex
xelatex mcmthesis-demo.tex
```

你可以将生成的 mcmthesis.cls 拷贝至 TEXMF/tex/latex/mcmthesis/ 目录，将 mcmthesis.dtx 拷贝至 TEXMF/source/latex/mcmthesis/，将 mcmthesis.pdf、mcmthesis-demo.tex、mcmthesis-demo.pdf、figures/ 和 code/ 拷贝至 TEXMF/doc/latex/mcmthesis/，然后在终端执行 texhash；也可以将 mcmthesis.cls 放在当前目录直接使用。

生成的 mcmthesis-demo.tex 是一个示例文件，你可以参照这个文件来构建你的论文；也可以直接修改这个文件。

3 使用说明

3.1 依赖

mcmthesis 依赖于以下宏包，这些宏包在常见的 TEX 发行版中都已包含，在安装使用之前，请确认你的 TEX 发行版中正确安装了这些宏包。

xkeyval	etoolbox	fancyhdr	fancybox
ifthen	lastpage	listings	appendix
amsmath	amssymb	amsfonts	amsbsy
bm	mathrsfs	latexsym	paralist
longtable	multirow	hhline	tabularx
ctex	xeCJK	CJK	xCJK2uni
tabu	environ	longtable	hologo
array	flafter	pifont	calc
colortbl	booktabs	geometry	fontenc
berasans	hyperref	ifpdf	ifxetex
graphicx	epstopdf	bmpsize	xcolor

| longtable | tabu | hologo | palatino |

如果你尚未安装这些宏包，可以启动你的 TeX 发行版的宏包管理器来安装；或者到 http://www.ctan.org 上搜索下载并安装。

3.2 选项

mcmthesis 定义了一些选项，用来控制模板的行为。你可以在载入文档类的时候指定这些选项的值，例如

```
\documentclass[tcn = 12345, problem = B, titlepage = false]{mcmthesis}
```

\mcmsetup 你也可以使用 \mcmsetup{⟨*key-value* 列表⟩} 来指定这些值，例如

```
\documentclass{mcmthesis}
%\documentclass[CTeX = true]{mcmthesis}  % 当使用 CTeX 套装时使用该行设置
\mcmsetup{tcn = 12345, problem = B, titlepage = false}
```

两种做法效果等同。

当前，mcmthesis 有八个选项：

CTeX 兼容选项，默认关闭。当使用 2.9.2.164 版本的 CTeX 套装时请打开。

tcn 队伍控制号码，接受一个字符串作为值；输入的值将显示在摘要页上和每一页的页眉上；默认为 0000。

problem 选题，接受一个字符串作为值；输入的值将显示在摘要页上；默认为 A。

sheet 布尔值；为真时将输出摘要页，否则不输出；默认为 true。

titleinsheet 布尔值；为真时将在摘要页输出标题，否则不输出；默认为 false。

keywordsinsheet 布尔值；为真时将在摘要页输出关键字，否则不输出；默认为 false。

titlepage 布尔值；为真时将输出标题页，否则不输出；默认为 true。

abstract 布尔值；为真时将在标题页输出摘要和关键词，否则不输出；默认值为 true。

注意，titleinsheet 和 keywordsinsheet 的效果受 sheet 的影响。若 sheet = false，则不论前二者的真假，均不会在摘要页上输出标题和/或关键字。另一方面，若 sheet = true，则摘要部分总是会出现在摘要页。abstract 与 titlepage 选项的关系于前述类似。

3.3 题号

\problem 　　除了使用 \mcmsetup 来指定题号，你还可以使用 \problem{⟨题号⟩} 命令来选择题号。后一种方式是为了兼容而提供的，不推荐使用。

3.4 环境

abstract (*env.*) 　　mcmthesis 重新定义了 abstract 环境，并且定义了 keywords 环境。需要注
keywords (*env.*) 意的是，他们的行为和 LaTeX 标准的 \title 命令类似——在使用的时候，只是记录内容，而并不输出内容；内容的实际输出要等到 \maketitle 命令。

memo (*env.*) 　　mcmthesis 定义有 memo 环境。它接受一个可选参数，作为其标题。设计该环境的初衷是我们发现近年的 MCM 竞赛常常要求学生生成一封信件或者备忘录，作为论文的一部分。

memoto 　　memo 环境有一些辅助命令：
memofrom
memosubject 　　\memoto 表示这份备忘录是留给谁的。
memodate
memologo 　　\memofrom 表示这份备忘录是谁留下的。

　　\memosubject 表示这份备忘录的主题。

　　\memodate 表示留下这份备忘录的日期。

　　\memologo 其中包含的内容将在输出备忘录的 LOGO 时被调用。

3.5 摘要页头部设置

\headset 　　MCM/ICM 的主办方经常变动摘要页头部的年份及赛事名称说明的格式，可谓岁岁年年各不同。因此，模板很难保证这部分的格式与当年的要求完全一致，故而给出一个易于修改的接口。例如：

```
\renewcommand{\headset}{{\Large\the\year}\\MCM/ICM\\Summary Sheet}
```

将会输出：

<div align="center">

2024
MCM/ICM
Summary Sheet

</div>

3.6 编译方式

　　模板支持多种编译方式：

- X⅁LaTeX（若含中文）；

- pdfLaTeX **这是推荐的方式**；

- LaTeX + DVIPDFMx。

3.7 中文支持

由于 MCM/ICM 要求以英文写作，所以模板没有内建的中文支持。如果你在文章中需要使用个别中文字符，可以自行使用合适中文支持方式。例如，使用 CTeX 宏集：

```
\usepackage[UTF8, nocap]{ctex}
```

4 版本历史

5.1.0a 首次上传到 CTAN。

5.1.0b 修复 CheckSum 和一些拼写错误。

5.1.0c 新增 titleinsheet 等选项。

5.1.0d 修改 problem 的定义方式，定义 \mcmsetup{⟨*key-val* 列表⟩} 以修改选项，调高了摘要页表格的位置，修复摘要页和标题页页码的问题，修复标题、摘要和关键字过长时分行、分页的问题。

5.1.0e 重新定义摘要页顶部的表格，以符合赛事主办方 COMAP 的最新版的摘要页。

5.1.0f 取消 TCN 和选题的红色标记。

6.0 微调输出格式，新增选项 CTeX 以兼容 2.9.2.164 版本的 CTeX 套装。

6.1 修复问题。

6.2 可定制的 headset。

6.2.1 将默认字号由 11pt 修改为 12pt。

6.3 修改 summary 的版面样式。

6.3.1 将默认的版面尺寸由 a4paper 修改为 letterpaper。

6.3.2 修复了一些版式异常和兼容性问题。

The mcmthesis class v6.3.2* → 中文版

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Abstract

This template is designed for MCM/ICM. The template configured fonts, header and footer and summary sheet style, accroding to the requirements of COMAP. This document describes the template.

5   Introduction

This template was designed by latexstudio first, and was improved by him following the suggestions from contest takers. In the beginning of the year 2014, Liam Huang redesigned it, by using key-value syntax, and fixed known bugs. Liam reimplemented it at the begining of the year 2015, by DocStrip, and uploaded it to CTAN.

6   Installation Guide

6.1   Download

You could find the latest version of this template at the project homepage. We will not maintain any other mirror.

CTAN http://www.ctan.org/pkg/mcmthesis

GitHub https://github.com/latexstudio-org/mcmthesis

LaTeXStudio https://www.latexstudio.net

Moreover, this template had been uploaded to CTAN, so that it could be managed by the package manager of your distribution, such as TEX Live.

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*This Document corresponds to mcmthesis v6.3.2, dated 2024/01/15.

6.2   Installation

We denote SOURCE as the folder, who contains the file you've just downloaded. Execute these command in the terminal.

```
cd SOURCE
xetex mcmthesis.dtx
xelatex mcmthesis.dtx
xelatex mcmthesis.dtx
xelatex mcmthesis-demo.tex
xelatex mcmthesis-demo.tex
```

To finish the installation, you could copy mcmthesis.cls to TEXMF/tex/latex/mcmthesis/, copy mcmthesis.dtx to TEXMF/source/latex/mcmthesis/, copy mcmthesis.pdf, mcmthesis-demo.tex, mcmthesis-demo.pdf, figures/ and code/ to TEXMF/doc/latex/mcmthesis/, and then run texhash in your terminal; you could also put mcmthesis.cls in the same folder of the master file.

mcmthesis-demo.tex is a generated demo file, you could write the manuscript of you paper by mimicing this file; you may also modify this file to build your paper.

7   Usage

7.1   Dependence

The mcmthesis class depends on the following pakcages. These packages has been installed in common TEX distribution. Before installation, please make sure that you have installed these packages correctly.

xkeyval	etoolbox	fancyhdr	fancybox
ifthen	lastpage	listings	appendix
amsmath	amssymb	amsfonts	amsbsy
bm	mathrsfs	latexsym	paralist
longtable	multirow	hhline	tabularx
ctex	xeCJK	CJK	xCJK2uni
tabu	environ	longtable	hologo
array	flafter	pifont	calc
colortbl	booktabs	geometry	fontenc
berasans	hyperref	ifpdf	ifxetex
graphicx	epstopdf	bmpsize	xcolor

| longtable | tabu | hologo | palatino |

If you haven't install these packages, you could execute the package manager of your distribution and install them; you could also download them from http://www.ctan.org.

7.2 Options

mcmthesis defined serval options to control the behaviour of the template. You could specify these options while loading the class.

```
\documentclass[tcn = 12345, problem = B, titlepage = false]{mcmthesis}
```

\mcmsetup You may also use the command \mcmsetup{⟨*key-value list*⟩} to specify them.

```
\documentclass{mcmthesis}
\mcmsetup{tcn = 12345, problem = B, titlepage = false}
```

The two methods share the same effect.

mcmthesis has seven options.

tcn The team control number, recieves a string as value; this value will be displayed on summary sheet and every page's header. The default value is 0000.

problem The question, recieves a string as value; this value will be displayed on summary sheet. The default value is A.

sheet Bool, true to print the summary sheet, default is true.

titleinsheet Bool, true to print the title in the summary sheet, default is false.

keywordsinsheet Bool, true to print keywords in the summary sheet, default is false.

titlepage Bool, true to print the titlepage, default is true.

abstract Bool, true to print the abstract on the titlepage, default is true.

Note that the effect of titleinsheet and keywordsinsheet are under the control of the option sheet, that is, if sheet is set to false, title and/or keywords will not be printed on the summary sheet, whatever the value of these two options are. On the other hand, the abstract will always be printed on the summary sheet, if the sheet is set to true. The relationship between abstract and titlepage is similar to that just mentioned.

7.3 Question

\problem   Besides using \mcmsetup to choose question, you could also use \problem{⟨*Question*⟩} to do this. However, the later one is here just because of backward compatibility, and is not recommended any longer.

7.4 Environment

abstract (*env.*)   mcmthesis redefined the abstract environment, and defined a new envi-
keywords (*env.*)   ronment named keywords. Note that these two environments behave like the standard \title — they will not print any contents to the PDF file when they are used but just record them; the output task belongs to \maketitle.

memo (*env.*)   mcmthesis defines the memo environment, which accepts one optional argument as the title. This work is inspired by the fact that in recent years, MCM requires students to provide a letter or memorandum as a part of the thesis.

memoto   The memo environment is defined with some helper macros listed below:

memofrom
\memoto describes the person you want to leave the memorandum to.

memosubject

memodate   \memofrom describes who is the author of the memorandum.

memologo
\memosubject describes the subject of the memorandum.

\memodate describes the date of the memorandum.

\memologo the command that will be executed to print a logo for the memorandum.

7.5 The headset of the Summary Sheet

\headset   Due to the frequent change of the headset's style of the Summary Sheet from the host of MCM/ICM, it's difficult for me to keep in with. Hence, a easy-to-modified interfaced is designed. Let's see an succinct example:

```
\renewcommand{\headset}{{\Large\the\year}\\MCM/ICM\\Summary Sheet}
```

while the output is:

<div align="center">

2024

MCM/ICM

Summary Sheet

</div>

7.6   Compilation Workflow

The template supports various kinds of compilation workflow:

- XLATEX(If with chinese and so on);

- pdfLATEX (**recommend**);

- LATEX + DVIPDFMx。

8   History

5.1.0a First release to CTAN.

5.1.0b Fix the bug of CheckSum and typos.

5.1.0c Import options, such as titleinsheet.

5.1.0d Change the way to define problem, create \mcmsetup{⟨*key-val list*⟩} to modify the option, slightly lift the table on the summary sheet, fix the bug of page number and fix the bug of title, abstract and keywords.

5.1.0e Redefine the table at the top of the summary sheet to match the latest summary sheet from COMAP, the maker of the contest.

5.1.0f Cancle the red emphasizing of tcn and problem mark in the table at the topo of the summary sheet.

6.0 Change the output style slightly.

6.1 Bugfix.

6.2 Making headset of the Summary Sheet modifible.

6.2.1 Change default fontsize, from 11pt to 12pt.

6.3 Change summary sheet layout and demo code.

6.3.1 Change the default papersize, frome a4paper to letterpaper.

6.3.2 fixed some bugs and ctex compatibility.

9   The Implementation

9.1   Basic Information

1 ⟨∗class⟩
2 \NeedsTeXFormat{LaTeX2e}[1999/12/01]
3 \ProvidesClass{mcmthesis}
4   [2024/01/19 v6.3.2 The Thesis Template Designed For MCM/ICM]
5 \typeout{The Thesis Template Designed For MCM/ICM}
6 \def\MCMversion{v6.3.2}

9.2   Options

Loading xkeyval and etoolbox to handle key-value options.

7 \RequirePackage{xkeyval}
8 \RequirePackage{etoolbox}

Declaring options.

9 \define@boolkey{MCM}[MCM@opt@]{CTeX}[false]{}
10 \define@boolkey{MCM}[MCM@opt@]{titlepage}[true]{}
11 \define@boolkey{MCM}[MCM@opt@]{abstract}[true]{}
12 \define@boolkey{MCM}[MCM@opt@]{sheet}[true]{}
13 \define@boolkey{MCM}[MCM@opt@]{titleinsheet}[false]{}
14 \define@boolkey{MCM}[MCM@opt@]{keywordsinsheet}[false]{}
15 \define@cmdkeys{MCM}[MCM@opt@]{tcn,problem}
16 \define@key{MCM}{tcn}[0000]{\gdef\MCM@opt@tcn{#1}}
17 \define@key{MCM}{problem}[A]{\gdef\MCM@opt@problem{#1}}
18 \setkeys{MCM}{tcn=0000,problem=B}
19
20 \define@key{mcmthesis.cls}{tcn}[0000]{\gdef\MCM@opt@tcn{#1}}
21 \define@key{mcmthesis.cls}{problem}[A]{\gdef\MCM@opt@problem{#1}}
22 \define@boolkey{mcmthesis.cls}[MCM@opt@]{titlepage}{}
23 \define@boolkey{mcmthesis.cls}[MCM@opt@]{abstract}{}
24 \define@boolkey{mcmthesis.cls}[MCM@opt@]{sheet}{}
25 \define@boolkey{mcmthesis.cls}[MCM@opt@]{titleinsheet}{}
26 \define@boolkey{mcmthesis.cls}[MCM@opt@]{keywordsinsheet}{}
27 \MCM@opt@sheettrue
28 \MCM@opt@titlepagetrue
29 \MCM@opt@titleinsheetfalse
30 \MCM@opt@keywordsinsheetfalse
31 \MCM@opt@abstracttrue

\mcmsetup

32 \newcommand{\mcmsetup}[1]{\setkeys{MCM}{#1}}

Processing options.

```
33 \ProcessOptionsX\relax
```

Loading document class.

```
34 \LoadClass[letterpaper, 12pt]{article}
```

User interface.

```
35 \newcommand{\team}{Team \#\ \MCM@opt@tcn}
```

9.3   Loading Packages

```
36 \RequirePackage{fancyhdr, fancybox}
37 \RequirePackage{ifthen}
38 \RequirePackage{lastpage}
39 \RequirePackage{listings}
40 \RequirePackage[toc, page, title, titletoc, header]{appendix}
41 \RequirePackage{paralist}
42 \RequirePackage{amsthm, amsfonts}
43 \RequirePackage{amsmath, bm}
44 \RequirePackage{amssymb, mathrsfs}
45 \RequirePackage{latexsym}
46 \RequirePackage{longtable, multirow, hhline, tabularx, array}
47 \RequirePackage{flafter}
48 \RequirePackage{pifont, calc}
49 \RequirePackage{colortbl, booktabs}
50 \RequirePackage{geometry}
51 \RequirePackage[T1]{fontenc}
52 \RequirePackage[scaled]{berasans}
53 \RequirePackage{hyperref}
54 \RequirePackage{ifpdf, ifxetex}
55 \ifMCM@opt@CTeX
56 \else
57   \RequirePackage{environ}
58 \fi
```

Loading graphicx and its relations after checking drivers.

```
59 \ifpdf
60   \RequirePackage{graphicx}
61   \RequirePackage{epstopdf}
62 \else
63   \ifxetex
64     \RequirePackage{graphicx}
65   \else
66     \RequirePackage[dvipdfmx]{graphicx}
```

```
67      \RequirePackage{bmpsize}
68    \fi
69  \fi
70  \RequirePackage[svgnames]{xcolor}
```

9.4   **hyperref** Settings

```
71  \ifpdf
72    \hypersetup{hidelinks}
73  \else
74    \ifxetex
75      \hypersetup{hidelinks}
76    \else
77      \hypersetup{dvipdfm, hidelinks}
78    \fi
79  \fi
```

9.5   Page Layout

Setting paper size and margin sep.

```
80  \geometry{letterpaper, margin = 1in}
```

Making the footer and header.

```
81  \pagestyle{fancy}
82  \fancyhf{}
83  \lhead{\small\sffamily \team}
84  \rhead{\small\sffamily Page \thepage\ of \pageref{LastPage}}
```

Setting \parskip.

```
85  \setlength\parskip{.5\baselineskip}
```

9.6   Redefining TOC

```
86  \renewcommand\tableofcontents{%
87      \centerline{\normalfont\Large\bfseries\sffamily\contentsname
88          \@mkboth{%
89              \MakeUppercase\contentsname}{\MakeUppercase\contentsname}}%
90      \vskip 5ex%
91      \@starttoc{toc}%
92      }
```

9.7   Mastering Floats, Figures and Tables

Setting counters. Here totalnumber is the maximum number of floats on a text page, topnumber is the maximum number of floats at top of a text page

and bottomnumber is the maximum number of floats at bottom of a text page. Obviously, we have totalnumber = topnumber + bottomnumber.

```
93 \setcounter{totalnumber}{4}
94 \setcounter{topnumber}{2}
95 \setcounter{bottomnumber}{2}
```

Setting float fractions.

```
96 \renewcommand{\textfraction}{0.15}
97 \renewcommand{\topfraction}{0.85}
98 \renewcommand{\bottomfraction}{0.65}
99 \renewcommand{\floatpagefraction}{0.60}
```

Setting caption names.

```
100 \renewcommand{\figurename}{Figure}
101 \renewcommand{\tablename}{Table}
```

Setting graphic paths.

```
102 \graphicspath{{./}{./img/}{./fig/}{./image/}{./figure/}{./picture/}
103          {./imgs/}{./figs/}{./images/}{./figures/}{./pictures/}}
```

9.8   Designing Sheets and their Relations

Redefining \maketitle, which will check if the control sheet and titlepage should be printed.

```
104 \def\maketitle{%
105   %\let\saved@thepage\thepage
106   %\let\thepage\relax
107   \ifMCM@opt@sheet
108   \makesheet
109   \fi
110   \newpage
111   \setcounter{page}{1}
112   \pagestyle{fancy}
113   \ifMCM@opt@titlepage
114     \MCM@maketitle
115   \fi
116   \newpage
117 }
```

Making the abstract environment.

```
118 \def\abstractname{Summary}
119 \ifMCM@opt@CTeX
120   \newbox\@abstract%
```

```
121    \setbox\@abstract\hbox{}%
122    \long\def\abstract{\bgroup\global\setbox\@abstract\vbox\bgroup\hsize\textwidth\leftskip1cm\
123    \def\endabstract{\egroup\egroup}
124    \def\make@abstract{%
125      \begin{center}
126        \textbf{\abstractname}
127      \end{center}
128      \usebox\@abstract\par
129    }
130  \else
131    \RenewEnviron{abstract}{\xdef\@abstract{\expandonce\BODY}}
132    \def\make@abstract{%
133      \begin{center}
134        \textbf{\abstractname}
135      \end{center}
136      \@abstract\par
137    }
138  \fi
139  \newenvironment{letter}[1]{%
140        \par%
141        \bgroup\parindent0pt%
142        \begin{minipage}{5cm}
143        \flushleft #1%
144        \end{minipage}}
145        {\egroup\smallskip}
146
```

Making the keywords environment.

```
147  \def\keywordsname{Keywords}
148  \ifMCM@opt@CTeX
149    \newbox\@keywords
150    \setbox\@keywords\hbox{}
151    \def\keywords{\global\setbox\@keywords\vbox\bgroup\noindent\leftskip0cm}
152    \def\endkeywords{\egroup}%
153    \def\make@keywords{%
154     \par\hskip.4cm\textbf{\keywordsname}: \usebox\@keywords\hfill\par
155    }
156  \else
157    \NewEnviron{keywords}{\xdef\@keywords{\expandonce\BODY}}
158    \def\make@keywords{%
159      \par\noindent\textbf{\keywordsname}:
160      \@keywords\par
161    }
```

162 `\fi`

`\headset`

163 `\newcommand{\headset}{{\the\year}\\MCM/ICM\\Summary Sheet}`

Defining the `\makesheet`.

164 `\newcommand{\problem}[1]{\mcmsetup{problem = #1}}`
165 `\def\makesheet{%`
166 `  \thispagestyle{empty}%`
167 `  \null%`
168 `  \vspace*{-5pc}%`
169 `  \begin{center}`
170 `  \begingroup`
171 `  \setlength{\parindent}{0pt}`
172 `    \begin{minipage}[t]{0.33\linewidth}`
173 `     \centering%`
174 `     \textbf{Problem Chosen}\\[0.7pc]`
175 `     {\Large\textcolor{red}{\MCM@opt@problem}}\\[2.8pc]`
176 `    \end{minipage}%`
177 `    \begin{minipage}[t]{0.33\linewidth}`
178 `     \centering%`
179 `     \textbf{\headset}%`
180 `    \end{minipage}%`
181 `    \begin{minipage}[t]{0.33\linewidth}`
182 `     \centering%`
183 `     \textbf{Team Control Number}\\[0.7pc]`
184 `     {\Large\textcolor{red}{\MCM@opt@tcn}}\\[2.8pc]`
185 `    \end{minipage}\par`
186 `  \rule{\linewidth}{1.5pt}`
187 `  \endgroup`
188 `  \vskip 5pt%`
189 `  \ifMCM@opt@titleinsheet`
190 `    \normalfont \LARGE \@title \par`
191 `  \fi`
192 `  \end{center}`
193 `\ifMCM@opt@keywordsinsheet`
194 `  \make@abstract`
195 `  \make@keywords`
196 `\else`
197 `  \make@abstract`
198 `\fi}`

Defining the `\MCM@maketitle`

```
199 \newcommand{\MCM@maketitle}{%
200   %\let\thepage\saved@thepage
201   %\setcounter{page}{1}
202   \begin{center}%
203   \let \footnote \thanks%
204   \pagestyle{fancy}%
205     {\LARGE \@title \par}%
206     \vskip 1.5em%
207     {\large
208       \lineskip .5em%
209       \begin{tabular}[t]{c}%
210         \@author
211       \end{tabular}\par}%
212     \vskip 1em%
213     {\large \@date}%
214   \end{center}%
215   \par
216   \vskip 1.5em%
217   \ifMCM@opt@abstract%
218     \make@abstract
219     \make@keywords
220   \fi%
221 }
```

9.9   the memo environment

Defining macros to store information here.

```
222 \def\MCM@memoto{\relax}
223 \newcommand{\memoto}[1]{\gdef\MCM@memoto{#1}}
224 \def\MCM@memofrom{\relax}
225 \newcommand{\memofrom}[1]{\gdef\MCM@memofrom{#1}}
226 \def\MCM@memosubject{\relax}
227 \newcommand{\memosubject}[1]{\gdef\MCM@memosubject{#1}}
228 \def\MCM@memodate{\relax}
229 \newcommand{\memodate}[1]{\gdef\MCM@memodate{#1}}
230 \def\MCM@memologo{\relax}
231 \newcommand{\memologo}[1]{\gdef\MCM@memologo{\protect #1}}
232 \def\@letterheadaddress{\relax}
233 \newcommand{\lhaddress}[1]{\gdef\@letterheadaddress{#1}}
```

Now, we could define the memo environment.

```
234 \newenvironment{memo}[1][Memorandum]{%
```

```
235  \pagestyle{fancy}%
236  \ifthenelse{\equal{\MCM@memologo}{\relax}}{%
237    % without logo specified.
238  }{%
239    % with logo specified
240    \begin{minipage}[t]{\columnwidth}%
241      \begin{flushright}
242        \vspace{-0.6in}
243        \MCM@memologo
244        \vspace{0.5in}
245      \par\end{flushright}%
246    \end{minipage}%
247  }
248  \begin{center}
249    \LARGE\bfseries\scshape
250    #1
251  \end{center}
252  \begin{description}
253    \ifthenelse{\equal{\MCM@memoto}{\relax}}{}{\item [{To:}] \MCM@memoto}
254    \ifthenelse{\equal{\MCM@memofrom}{\relax}}{}{\item [{From:}] \MCM@memofrom}
255    \ifthenelse{\equal{\MCM@memosubject}{\relax}}{}{\item [{Subject:}] \MCM@memosubject}
256    \ifthenelse{\equal{\MCM@memodate}{\relax}}{}{\item [{Date:}] \MCM@memodate}
257  \end{description}
258  \par\noindent
259  \rule[0.5ex]{\linewidth}{0.1pt}\par
260  \bigskip{}
261 }{%
262  \clearpage
263  \pagestyle{fancy}%
264 }
```

9.10 Mathematics

Theorems.

```
265 \newtheorem{Theorem}{Theorem}[section]
266 \newtheorem{Lemma}[Theorem]{Lemma}
267 \newtheorem{Corollary}[Theorem]{Corollary}
268 \newtheorem{Proposition}[Theorem]{Proposition}
269 \newtheorem{Definition}[Theorem]{Definition}
270 \newtheorem{Example}[Theorem]{Example}
```

define the section fonts and spaces.

```
271 \renewcommand\section{\@startsection{section}{1}{\z@}%
```

```
272   {-1sp\@plus -.2ex \@minus -.2ex}%
273   {1pt \@plus .2ex}%
274   {\rmfamily\Large\bfseries}}
275 \renewcommand\subsection{\@startsection{subsection}{2}{\z@}%
276   {-1sp\@plus -.2ex \@minus -.2ex}%
277   {1pt \@plus .2ex}%
278   {\rmfamily\large\bfseries}}
279 \renewcommand\subsubsection{\@startsection{subsubsection}{3}{\z@}%
280   {-.5ex\@plus -1ex \@minus -.2ex}%
281   {.25ex \@plus .2ex}%
282   {\rmfamily\normalsize\bfseries}}
283 \renewcommand\paragraph{\@startsection{paragraph}{4}{\z@}%
284   {1ex \@plus1ex \@minus.2ex}%
285   {-1em}%
286   {\rmfamily\normalsize}}
```

Other definitions.

```
287 \providecommand{\dif}{\mathop{}\!\mathrm{d}}
288 \providecommand{\me}{\mathrm{e}}
289 \providecommand{\mi}{\mathrm{i}}
```

9.11   Listing Settings

```
290
291
292 \definecolor{grey}{rgb}{0.8,0.8,0.8}
293 \definecolor{darkgreen}{rgb}{0,0.3,0}
294 \definecolor{darkblue}{rgb}{0,0,0.3}
295 \def\lstbasicfont{\fontfamily{pcr}\selectfont\footnotesize}
296 \lstset{%
297 % indexing
298   % numbers=left,
299   % numberstyle=\small,%
300 % character display
301   showstringspaces=false,
302   showspaces=false,%
303   tabsize=4,%
304 % style
305   frame=lines,%
306   basicstyle={\footnotesize\lstbasicfont},%
307   keywordstyle=\color{darkblue}\bfseries,%
308   identifierstyle=,%
309   commentstyle=\color{darkgreen},%\itshape,%
```

```
310    stringstyle=\color{black}%
311 }
312 \lstloadlanguages{C,C++,Java,Matlab,Mathematica}

313 ⟨/class⟩
314 ⟨class⟩\endinput
```