A WRITER'S MANUAL FOR REPORTS
SUBMITTED TO
COMPUTER SCIENCE 195 - 196

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CSci 195-10
Senior Computer Science Design Project
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ABSTRACT

A Writer's Manual for Reports Submitted to  
Computer Science 195-196  
By Arnold Charles Meltzer

This manual informs the writer of a report in Computer Science 195-196 of the requirements, organization, style and format to be used in the reports to be submitted in the course. It specifies the order of presentation and shows the required format of the title page. The manual informs the writer of the requirement to use a computer with a word processing program and a high quality laser or ink-jet matrix printer to produce the report.

This manual is written in the style and format of a report used in the Design Project Course and allows the writer the ability to see how a report should be presented. It is composed of various chapters on style and format and shows the manner in which to subdivide a chapter in outline form. The manual also explains a writing style that makes for a good report. Students who use this manual should have a much easier job of producing their report and will make the job of the grader easier. Students who do not follow the format, style and recommendations contained in this manual will probably fail to pass the course.
DEDICATION

This manual is dedicated to all of the students who had to produce a report within the Senior Computer Science Design Project who did not have this manual to use. For their years of toil and for their confusion, and to their guessing about what style to use and how to present the material this manual would have been a blessing.
ACKNOWLEDGMENT

The author would like to acknowledge Mrs. Marilyn Henry, Miss Deborah Swanson and Professor Rachelle Heller for reviewing many of the rough drafts of this manual. Their editing capabilities and suggestions for additions have been invaluable.
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1. INTRODUCTION

This manual is designed to help the student in the Senior Computer Science Design Project courses prepare a report that is well written and in the correct format. The manual is written in the style that is described herein. This should help the student in presenting a report, for if it looks like this manual, it is probably in the correct format. The report is a formal document. It is probably the most formal document that a person writes. It has a particular style and tone. It is written in the third person passive voice and does not have the words we, I, us, or you in the text. The material in the report is not about we, I, us or you, it is about the technical theory and material that the author wishes to convey to the reader.

Chapter 1 is an introduction and states the reason for the manual. It gives a summary of each of the remaining chapters in the manual.

Chapter 2 presents the order of presentation of material in a report. It discusses the Title Page and gives an example of such a page. This is followed by discussions of the abstract, dedication and acknowledgement pages. The method used to present a Table of Contents follows. The correct method to show Lists of Figures, Tables and Symbols is discussed. This is followed by a presentation of the Chapters that constitute the body of a report. A section on the References and Appendices concludes the Chapter.

Chapter 3 presents a small section on writing style. It discusses the voice of the paper and the use of jargon and slang. The order of the presentation of material in a chapter is shown. Ideas on graphics and figures are developed next. How to present material in a reference and how to reference the items of the references in the body of the text are discussed.

Chapter 4 describes the format of the report. It is a bottom-to-top development starting with the correct font to use and eventually ending with chapters.
2. ORDER OF PRESENTATION

In this Chapter the order of the presentation of material in a report is presented. Some parts are optional and may not be present in all reports. The order of presentation is very rigid and must be followed.

2.1 Title Page

The title page is a specified format, as shown in Figure 1.

2.2 Abstract

The abstract shall not exceed one page. The title of the project and the name of the writer must appear centered at the top of the abstract. Any acronyms in the abstract shall be spelled in full text. The abstract should review the entire report. A good rule of thumb is that there should be at least one sentence in the abstract about each page in the body of the report. No references to the contents of the report should be made in the abstract, since the reader of an abstract will not have the report available to read. In industry, the abstract is often called the executive overview. Appendix A shows an example abstract.

2.3 Dedication (Optional)

If you wish to dedicate the report or the project to someone it is done on this page. It is not required to dedicate the report.

2.4 Acknowledgments (Optional)

You should acknowledge those people or companies that helped you in any way with the project. If you did not receive any help then it is not necessary to have an acknowledgement page.

2.5 Table of Contents

The Table of Contents is in the same style as the Table of Contents of this manual. Notice that an entry for the Table of Contents does not appear in the Table of Contents, since the reader knows where the Table of contents is located when he\she is looking at it.

2.6 List of Figures

List all of the figures that appear in the body of the report starting with Figure 1 and proceeding consecutively through the body of the report.
Project Proposal Report (18 pt)

for the (16 pt)

Design of an Automatic Face-Drawing Program (18 pt)

By (16 pt)

Leonardo da Vinci (20 pt)

CSci 195-10 (16 pt)
Senior Computer Science Design Project (16 pt)
September 17, 2003 (16 pt)
2.7 List of Tables
List all of the tables that appear in the body of the report starting with Table 1 and proceeding consecutively through the body of the report.

2.8 List of Symbols (Optional)
If the report contains many symbols or acronyms, they should be listed in alphabetical order with their meanings.

2.9 Body
The body consists of chapters as specified below.

2.9.1 Introduction
The Introduction is a short chapter that summarizes the project and discusses the contents of all of the other chapters in the report.

2.9.2 Theory
This chapter is found only in the Final Design Report and the Final Project Report. It discusses the underlying concepts on which the project is based. Such concepts as linked lists, HTML representation, client-server concepts, etc. are the types of ideas to be presented in this chapter.

2.9.3 Design of the Project
A top-down description of the project with all of the modules of software and methods explained at various levels depending upon the report. This is where block diagrams, PDL (Program Design Language), flowcharts and other methods of describing software are used to augment the text. Detailed PDL and flowcharts are needed only for the Critical Design Report, the Final Design Report and the Final Project Report.

2.9.4 Specifications of the Project
What the project does and what equipment or software is needed to make the project work.
2.9.5 Test to Verify the Design

Specific tests that will be done to test each module of the project and the integrated modules as they are assembled. The tests that are used on the entire project are also specified. The test must specify the specific data inputs and the specific expected outputs for each test.

2.9.6 Module List

This is a table that summaries all of the modules of software that are in the project. It shows the modules that call this module, the modules that this module calls, the number of lines of code in each module, the amount of time to code and test the module, and the amount of dollars that it costs to produce and test the module. Table 1 is an example of the material to be presented for the Module List.

Table No. 1 – Example of a Module List

<table>
<thead>
<tr>
<th>Module</th>
<th>Called By</th>
<th>It Lines of Code</th>
<th>Hrs. to Code</th>
<th>$ to Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td>-</td>
<td>Processing</td>
<td>310</td>
<td>25.0</td>
</tr>
<tr>
<td>Scanner</td>
<td>Input</td>
<td>Input</td>
<td>200</td>
<td>17.0</td>
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<tr>
<td>Direct</td>
<td>Input</td>
<td>Input</td>
<td>250</td>
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</tr>
<tr>
<td>Processing</td>
<td>Input</td>
<td>Output</td>
<td>175</td>
<td>16.0</td>
</tr>
<tr>
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<td>Processing</td>
<td>Processing</td>
<td>150</td>
<td>12.5</td>
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<tr>
<td>Cropping</td>
<td>Processing</td>
<td>Processing</td>
<td>270</td>
<td>22.0</td>
</tr>
<tr>
<td>Filtering</td>
<td>Processing</td>
<td>Processing</td>
<td>325</td>
<td>25.5</td>
</tr>
<tr>
<td>Output</td>
<td>Processing</td>
<td>Input</td>
<td>220</td>
<td>18.5</td>
</tr>
<tr>
<td>TOTALS</td>
<td></td>
<td></td>
<td>1900</td>
<td>158.0</td>
</tr>
</tbody>
</table>

2.9.7 Gantt Chart

This is the chart produced by the MS Project software. It has two parts. One is the table that shows the costs, hours worked, start and end times, duration and who does the work for each task in the project. The second part is the timeline figure of the tasks in the project. In addition, the tables showing the amount of time and the associated costs per week for each person in the project should be provided. Be sure to provided text in this chapter to explain the
figures and tables. Reference all figures and tables in the text. Appendix B is an example of the material that is available from Project.

2.9.8 Labor Costs by Week
This chapter discusses the estimated weekly labor costs associated with the project. It has a graph with three curves that show the original weekly labor costs as specified in the Project Proposal Report, the actual labor costs to date, and the projected labor costs to complete the project. Appendix C is an example of this type of material.

2.9.9 Economic Analysis
This chapter develops the economic costs for the prototype and the production product. Appendix D shows an example of an Economic Analysis.

2.9.10 Comparative Product Survey
This is a comparison among your product and other products of a similar nature that are in the market place. This chapter does not appear in a Progress Report.

2.9.11 Status Matrices
This chapter shows the progress being accomplished on each module and submodule of the project. Each table contains a column for:

a) Initial estimated hours of work to be done on the module from the Proposal,
b) Current total estimated hours of work to be done on the module,
c) Hours of work on the module to date,
d) Percentage of work completed for the module, and
e) Estimated hours of work needed to complete the module

Entries in columns c plus e must equal the number in column b. Column d is the ratio of column c over b. There are seven tables that show the status of the project at each review. These tables are:

2.9.11.1 Outlined
The amount of time to outline what will be in each module and submodule.

2.9.11.2 Designed
The amount of time to design the modules down to the lowest level using PDL, block diagrams, and flowcharts.
2.9.11.3 Constructed
The number of hours needed to code the routines.

2.9.11.4 Tested
The number of hours to unit test each module individually.

2.9.11.5 Integrated
The amount of time needed to integrate modules together and test them, as well as the time to test the completed project.

2.9.11.6 Documented
The amount of time needed to document the entire project, including all of the reviews. These hours must be allocated by module of software in this table.

2.9.11.7 Total
The total of the above with an entry for time spent in class. Appendix E shows an example of Status Matrices.

2.9.12 Conclusions
This section of the body of the report summaries the material found in the body and presents any conclusions that the author wishes to convey to the reader.

2.10 References
The References lists all of the papers, articles, books, monographs, web pages, etc. that are referenced in the body of the report. The list is in alphabetical order by the last name of the first author.

2.11 Appendices
Appendices are lettered as Appendix A Title, Appendix B Title, etc. and listed in the table of contents. One of the appendices that will be present in the Critical Design Report, the Final Design Report and the Final Project Report will be the User’s Manual. A second appendix that will be in the Final Project Report will be the documented listing of all of the software developed for the project.
3. SECTION STYLE

In this chapter the style of the writing is presented. A report is a very formal document and is written in a very formal style. Its presentation is in a specified order and with a restricted page layout.

3.1 Third Person Passive Voice

The report is a formal document and should not make references to the author as “I” or to the royal “we”. It should be written in the third person passive voice. The sentence, "The boy hit the ball using a baseball bat." is written in the active voice. In third person passive voice it is written as, "The ball was hit by the boy using a baseball bat.” This manual is written in the third person passive voice.

3.2 Jargon

Technical areas have a rich vocabulary of jargon that is used in conversation. Since the report is a formal document, jargon should not be used. If it must appear, it should be defined in the List of Symbols. This is particularly true of acronyms. Acronyms should be defined in the body of the text when first used. The full expression is shown the first time that it is mentioned in the text with the acronym in parentheses. For all subsequent mentions, the acronym alone may be used.

3.3 Slang

The report should not be written in the same manner that people talk. Most people use slang and idioms in their conversation. This has no place in a formal report. Do not use phrases such as 'broken down', 'split up', 'inputted'; use the better words of 'divided', 'separated', 'inserted'. Be very careful of the use of prepositions. Experience has shown that most students misuse prepositions. From the experience of the author, the following words may not be used in a report: up, down, in, out, broken, upload, download, inputted, inputting, outputted, outputting, and the phrase “in order to”.

3.4 Order of Presentation within a Chapter

Each chapter should start with an introduction to that chapter which summarizes the contents of the chapter. This is then followed with the development of the material pertinent to the chapter. The chapter should end with a summary of what important concepts were developed in the chapter. This is summarized in the famous quotation of "Tell them what you are going to tell them. Tell them. Tell them what you just told them.” In fact, this is the way
that the entire report is organized. The first chapter is an introduction that defines the problem and summaries the material to be found in the subsequent chapters. The middle chapters develop the work. The final chapter, Conclusions, summarizes the important concepts presented in all of the chapters of the body.

3.5 Length of the Report

The report should be written in a concise style. It should not be wordy or repetitive. A report of about 35 pages from title page through the references is about the correct length for a Progress Report, other reports that have additional design material will be longer. Additional material, such as computer programs and tabulated data, may be placed in appendices.

3.6 Figures

Figures are an important part of the material in a report. They should be presented in a clear and legible form. If there is text in a figure, it should be of a large enough size so that it is easily read. The figure should appear in the text immediately after it is cited in the text. If the figure is too large to be placed in the text, the usual case, it can be placed on the next page after first being cited in the text. Do not place all the figures at the end of a chapter or at the end of the report. Figures must also adhere to the margin requirement of the report. This may require that it be reduced before being submitted. Figures are labeled with a figure number and title situated under the figure. Figures may not use color to differentiate among its parts, since color will not reproduce on the copying machines. If a figure is presented in landscape orientation, the number and title should be under the figure near the right margin.

3.7 Graphs

A graph is a special type of figure that depicts numeral data in an easily understood form. It must comply with all of the size and space requirements of any figure. It is numbered as a figure in the text.

3.7.1 Graph Page Size

Graphs need to be large enough so that they can be easily read. The ordinate and abscissa must be labeled and units must be specified. For these reasons graphs are usually placed on a page alone. This is particularly true if the graph uses log or semilog paper. Remember the margin requirements for all pages. If special paper is used, the graph may need to be photo-reduced before being placed in the report.
3.7.2 Text in Graphs

The text associated with a graph must be legible. A legend that identifies curves, if multiple curves are shown on one set of axes, is essential. Spreadsheets are a useful way of developing graphs and will help in obtaining the correct format.

3.7.3 Shading and Color

Do not use color to differentiate curves on a graph. The color will not reproduce in the copying machines. Use different dashed lines and point symbols to differentiate the curves. Be sure to place a legend on the graph to differentiate the curves.

3.8 Tables

A Table is a special type of figure. Tables have a separate listing in the front piece. Tables have their table number and title above the table, while figures have their figure number and title below the figure. Tables should be used to present ordered information in a concise format. The Module List, the Economic Analysis and the Progress Matrices in the report will be presented as tables.

3.9 Footnotes

Footnotes are to be avoided. In a technical paper, if it is important enough to be placed in a footnote, it is important enough to be placed into the main text.

3.10 References

The references are a list of all of the references cited in the report. It is listed in alphabetical order by the first author's last name. Some rules for references are:

1) If there is only a single author, use the last and first name of the author.
2) If there are multiple authors, use the last names and initials of all of the authors.
3) If a few consecutive pages are cited from a book, then the page numbers are placed in the references. If the book is cited in multiple places, the page numbers of the citations are placed with the reference in the body of the report.

Examples of reference entries are:

1) A book with two authors which is cited only once.

2) A reference from a technical journal:


It is important that the pages of the reference be given. The reader should not have to read an entire piece in order to find the material that is being referenced. A journal citation should be complete with volume and number as well as month and date.

If the reference is to a non-paper type of work, such as a web site, the reference should be under the owner's name with a title and a complete web address to the site. Web addresses are usually placed inside < > to specify that they are web addresses.

The letters in square brackets are the index to the citation. It is composed of the first three letters from the first author's last name and the last two digits of the year of the publication. If the author should have more than one publication during the same year, then letters are appended to the index as [GOO94a] and [GOO94b]. The index is what is cited in the body of the report.

### 3.11 References in the Body of the Text

To refer to an entry in the references, an index is used. The index is shown in square brackets. It is placed in the text immediately after the reference is mentioned in the text, for example, “...which was shown by Goodman, et. al. [GOO94] in their ground breaking work on Internet measurements”. Do not place an index in the text without first mentioning the author's name. For example do not write "...as was shown in [GOO94], [ABD76], [FEL97] and [MAR96]". This does nothing to inform the reader of the authors without having to flip back and forth to the references. Instead the example sentence should be written as "...as was shown in Goodman [GOO94], Abd-Alla [ABD76], Feldman [FEL97] and Martin [MAR96]".

Sometimes it is necessary to reference a large textbook at several different sections of the book. The bibliographic citation will only have the authors, title, publisher and date of publication. To make such types of references, the particular pages where the material can be found in the book are added to the citation index. For example, if the text by Abd-Alla and Meltzer were to be cited several times in the body of the report and each citation was to a different section of the book, the first citation would appear as [ABD76, pp. 21-28]. The next time it was cited, the citation would appear as [ABD76, pp. 157-165]. For short articles, usually under 15 pages, it is not necessary to use this technique even if the citations are to different sections of the article.
3.12 Appendices

Appendices contain material that is pertinent to the report but which is not going to be commented upon or is too voluminous to be in the body of the text. Each appendix contains only a single coherent body of material. The User’s Manual is the type of material that is placed into an appendix since it does not directly effect the design of the project.
4. FORMAT

This chapter shows the format of a report. It is technical in detail, but allows for a standardized and easily read document.

4.1 Font
The font should be Times New Roman Regular or an equivalent proportional spacing font.

4.2 Type Size
The sentences should be in 12-point type.

4.3 Line Justification
The line should be fully justified, that is, justified both on the left and right.

4.4 Line Spacing
A 1.5 line spacing should be used between lines in a paragraph. Double of this spacing should be used between paragraphs, subsections and sections.

4.5 Page
The page size is 8.5 inches by 11 inches. The report is presented on a single side only.

4.5.1 Margins
Margins are:
1) Left or bound side - 1.5 inches, 2) Right side - 0.5 inches, 3) Top of the page - 1.0 inch and 4) Bottom – 1.0 inches

4.5.2 Page Numbers
Page numbers are different for the three parts of the report, namely the front pieces, the body and the appendices.

4.5.2.1 Front Pieces
Front pieces are those pages that come before Chapter 1 of the report. They start with the title page. They are numbered using lower case Roman numerals. The title page is considered page i, but is not numbered at the bottom. The next page, which is the Abstract, is numbered ii at
the bottom center of the page. All of the following pages of the front pieces are numbered consecutively.

4.5.2.2 Body

The body is the heart of the report and is numbered in Arabic numerals. The numbers run consecutively through the entire body. Do not start to renumber with each new chapter. Numbers appear centered at the bottom of the page. Every page must be numbered.

4.5.2.3 Appendices

The appendices, if any, are numbered individually with Arabic numerals starting with 1 and the numbers appear centered at the bottom of the page. For example, the pages of Appendix A should be numbered A-1, A-2, etc.

4.5.3 Headers and Footers

No headers or footers should be used in the body of the report

4.5.4 Widows and Orphans

No single line may appear at the bottom of a page and may not be separated from the paragraph at the top of a page. The spacing of paragraphs should be adjusted so that this does not occur.

4.6 Equations

Equations are an important part of reports. They are formatted as discussed below.

4.6.1 Location of Equations

Equations should be centered between margins on the page.

4.6.2 Numbering of Equations

Equations should be numbered at the right near the right margin. The number should be placed in parentheses. The equations should be numbered consecutively within each chapter. For example, the second equation in Chapter 3 would be shown as (3.2)

4.7 Indentation

Since the report is numbered using a decimal outline sequence, it is not necessary to indent the headings of sections and subsections. The beginning of each paragraph should be indented five spaces.
4.8 Subdivisions

The report is divided into subdivisions starting with chapters, sections, subsections and paragraphs. The report uses a decimal numbering system to specify the level the subsection.

4.8.1 Chapters

Chapters are the main subdivision of the report. They specify a major part. The first chapter is always titled Introduction and presents the concept of the project and a summary of the following chapters. The remaining chapters are as stated in this report under the section 2.9 titled Body.

4.8.2 Sections

Chapters are divided into sections. Sections should have a coherent focus that should be a subset of the topic of the chapter. For example, the chapter for the Design of the Project can have a section titled Client and another titled Server, if that is how the project is subdivided.

4.8.3 Subsections

Subsections are divisions of the sections and present a single part of the topic of the section if the section has more than one part. If there are not two or more subsections of a section, the single subsection should not be separated, but should be incorporated into the section.

4.8.4 Paragraphs

Paragraphs are constructed from sentences and have a single idea to present to the reader.

4.8.5 Titles of Subdivisions

The titles of the parts of a report are positioned and emphasized differently for various parts.

4.8.5.1 Front Pieces

The titles of each front piece should be centered on the page between margins and should be in bold upper-case characters of 12-point type.
4.8.5.2 Chapters

Chapter titles should be at the left margin on the page and should be in bold upper-case characters of 12-point type. For example:

1. INTRODUCTION

4.8.5.3 Other Subdivisions

All other subdivisions of a chapter or a section should not be indented and should be in bold lower-case characters of 12-point type. This manual is an example of the correct style for the placement of titles and subtitles.
5. CONCLUSIONS

The preceding chapters have shown the proper manner in which a report is to be submitted for Computer Science 195-196. The correct style of writing and the format of the report are shown. The technical requirements for the layout of the chapter and the proper presentation of material in the report are discussed. It is hoped that the use of this manual will make the job of preparing a technical report for the courses much easier for the student.
6. REFERENCES


APPENDIX A

EXAMPLE OF AN ABSTRACT
APPENDIX B

EXAMPLE OF MATERIAL FROM MS PROJECT
APPENDIX C

EXAMPLE OF LABOR COSTS
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FIGURE 1 - CUMMULATIVE LABOR COSTS BY WEEK
APPENDIX D

EXAMPLE OF AN ECONOMIC ANALYSIS
APPENDIX E

EXAMPLE OF STATUS MATRICES