



FACULTY OF ENGINEERING & SURVEY
DEPARTMENT OF CIVIL ENGINEERING

FINAL YEAR REPORT

Title of Project
can use a maximum of
3 lines

Subtitle if needed
can use a maximum of
3 lines

LastName1, FirstNames1 LastName2, FirstNames2
Registration Number1 Registration Number2

Submitted in the partial fulfilment of the
requirements for the award of a degree of
Bachelor of Civil Engineering (B.Eng.)
of Ndejje University

Supervised by First supervisor, Second supervisor

May 2021

Abstract

This is a succinct summary of aims, methods, conclusions, results, and significance of your study. Maximum word count: 300 Enables readers to identify the basic content of the report quickly and accurately and determine its relevance to their needs and thus decide whether they need to read the report in its entirety.

- *A clear and concise statement of the objectives*
- *Scope of the project.*
- *The methods used to solve the problem.*
- *A brief summary of the solution.*
- *Conclusions and Recommendations.*

Declaration

We declare that this thesis has been composed solely by myself/ourselves and that it has not been submitted, in whole or in part, in any previous application for a degree. Except where states otherwise by reference or acknowledgement, the work presented is entirely my/our own.

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Registration Number1	Registration Number2

Date:

Signature:

This thesis has been submitted for examination with my/our approval as university supervisors.

First supervisor	Second supervisor
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Date:

Signature:

Acknowledgements (optional)

The content and format of this page are up to the student. The acknowledgement should not exceed 30 words.

Dedication (optional)

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Acronyms

ADT Atlantic Daylight Time.

UTC Coordinated Universal Time.

Chapter 1

Introduction

The introduction should "set the stage" for which the work is undertaken. It should go from the general to the specific; that is, begin with a general description of the problem or technology area and proceed to the particular issue that is being addressed. It is not a summary of the work but rather the background and rationale for doing it. The chapter should have ? pages.

1.1 Background

Background information and events to acquaint the reader with the purpose for carrying out the work (e.g. production difficulties, redesign, design problems, material selection, excessive deflections, etc.). General references to other work (newspapers, journals etc) that help define the problem. This section should have a maximum of one page.

1.2 Problem Statement

An accurate and concise statement of the problem providing details not included in the abstract that leads into the body of the report. This section should have a maximum of half a page.

1.3 Objectives

Main objective and the specific objectives to be achieved and scope of activities by which they can be achieved.

1.3.1 Main Objective

This refers to the overall intention for the research. It is derived from the topic and statement of the problem and should be a summary in one short sentence. The student should state what the study intends to accomplish in general.

1.3.2 Specific Objectives

Specific objectives arise from the general objective. They focus on the variables and the relationship between them as postulated in the topic, statement of the problem and general objective. The general objective is broken down into 2-3 specific areas of focus that form the specific objectives/issues of the study. Specific objectives are stated in short practical sentences and numbered in Arabic numerals (1, 2, 3). They must be SMART i.e. Specific, Measurable, Achievable, Realistic and Time-bound. Students must have not more than three objectives.

1.4 Justification

Explain to the reader the urgency and need for the project/ study/ research. Perhaps give situations that have occurred that bring out this urgency – give measures e.g. losses, deaths etc. This section should have not more than two paragraphs of a maximum of six lines each.

1.5 Scope

The scope of your research simply refers to the boundaries of the research. Physical boundaries can be like the country, district, sub-county, firm, section of a road and so on and can even be put in a table for people who are going to collect data from more than three firms or locations. A map indicating the position of the project area

in relation to nearby geographical features should be included. The technical scope comes from the objectives i.e. if you have been contracted to build a structure, your technical scope may be to procure materials, supervise and pay workers, build as per the plan to finishing and then finally commissioning the structure. Maintenance and renovation are outside your scope of work.

1.6 Conceptual Framework

The conceptual framework is a scheme of concepts or variables and the postulated relationships between them. The variables are operationalised, i.e. broken down into how they are represented in the real world. Operationalisation of the variables helps to give a working definition and the observable equivalents that will represent its occurrence in the real world i.e. its indicators. The value of the conceptual framework is in helping the student to do a number of things through a diagram or illustration.

- The student looks at different variables (concepts) and how they relate to one another in the stated problem in her/his proposed study.*
- Two or three of the relationships that are most relevant to the student are then picked as the specific objectives of the study.*

The conceptual framework is a diagrammatic expression that combines your research objectives, methods, and tools and also has a loop or loops to some starting point or earlier points in the flow. The student should state what the diagram/illustration is and what it shows in three paragraphs, not bullets, on the input, process, and output.

Chapter 2

Literature Review

The purpose of academic research, among others, is to contribute to the body of existing knowledge. The student should show what relevant existing knowledge relates to what s/he wants to do research on. The student should:

- 1. Seek literature that lends support to the line of argument of the study.*
- 2. The specific objectives of the study should guide what literature to review.*
- 3. The student should assess the findings of other studies to show how they support one's argument and the gaps in existing knowledge as far as the proposed research is concerned.*

The outcome of literature review is to link one's proposed research to existing knowledge, identify gaps that justify the study and launch the argument for one's own research. It must have a logical flow and one should not over-quote. Any quotes should be limited to the necessary area of investigation and should be documented fully. The chapter should have ? pages.

2.1 Topic One

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2.1.2 Subsection Two

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2.1.3 Subsection Three

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2.2 Topic Two

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Chapter 3

Methodology

This is a detailed description of selected methodology and should be presented in unambiguous terms. The section comprises:

- *Research or project design - which describes the nature and pattern the research followed e.g. whether it is historical, descriptive survey, experimental or quasi experimental and location (optional), etc.*
- *Tools and equipment used to accomplish the project. A full description of each should be detailed.*
- *Research approaches – Qualitative or quantitative.*
- *Description of the geographical area and where population of the study exists.*
- *Description of the population from which samples have been selected.*
- *Data collection methods; including instruments and procedures used in the research or project described.*
- *Data quality control, which refers to reliability and validity of instruments.*
- *Measurements, which refer to the formulae or scales in the study.*
- *Data analysis, which involves organization and interpretation of the data generated. Both raw data and the analyzed form be kept both electronically and hardcopy for further reference later. Follow the following steps in preparing data for analysis: (i) receive the raw data sources (ii) Create electronic data base from the raw data sources (iii) Clean/Edit the database (iv) Correct and clarify the raw data sources (v) Finalize database (vi) Create data files from the data bases.*

The chapter should have ? pages.

3.1 Topic One

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3.2 Topic Two

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Chapter 4

Results and Discussion

*This section shall specifically include **design calculations, the drawings, the bills of quantities and cost estimates and cost benefit analysis, operations and maintenance plan and environmental impact assessment** of the project.*

- *Discussion of the solution - how well does it solve the problem? This section is the heart of the report and should include details of the solution leading up to the proposed design.*
- *In addition, discussion of the cost benefit analysis should involve identified costs and benefits for the proposed project, the value attached to them, and assumptions made. The analysis should also include the comparison between costs and benefits and decision criteria used.*

All of the figures and equations should be computer generated. Conclusive remarks should be made in the next chapter.

The chapter should have ? pages.

4.1 Topic One

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4.3 Topic Three

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Chapter 5

Conclusions and Recommendations

The conclusions should correspond to each of the objectives. This section should include central or important points of the solution as they relate to the problem objectives, recommended courses of action and generalizations of the solution that might relate to other situations. Details not provided in the abstract should be included here.

The chapter should have ? pages.

5.1 Topic One

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5.2 Topic Two

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5.3 Topic Three

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Appendices

This section contains all

- *questionnaires,*
- *interview transcripts,*
- *pilot reports,*
- *detailed tables, etc.*

This section should contain material that supplements the main text of the report (spreadsheets, detailed experimental results, details of equation derivation, program listings, etc.). If an equation is included in the body of the report, the derivation of that equation could be shown in the Appendix, or if you have a graph from a spreadsheet or program calculation, you could include the spreadsheet data or a program listing in the Appendix. The key point is that the Appendix is supplemental information. Depending on what was requested in the problem statement, detailed drawings might also go in the Appendix and only the overall assembly drawing would go in the body.

Appendix I: Work plan



Appendix II: Budget

Appendix III: Questionnaire

Appendix IV: Some L^AT_EX examples

Demonstration of abbreviations Define a glossary entry in file *Acronyms.tex*:

```
\newacronym{utc}{UTC}{Coordinated Universal Time}
```

Use a glossary entry: `\gls{utc}`

This L^AT_EXcode

```
\gls{utc} is 3 hours behind \gls{adt}.
```

will produce this:

Coordinated Universal Time (UTC) is 3 hours behind Atlantic Daylight Time (ADT).

At the first time usage, the abbreviation is mentioned in brackets.

With the second usage of an abbreviation, the abbreviated term itself is not shown any more: UTC is still 3 hours behind ADT.

Demonstration of a horizontal bar chart Figure 5.1 shows an example of a horizontal bar chart generated with `tikzpicture` (`pgfplots` package).

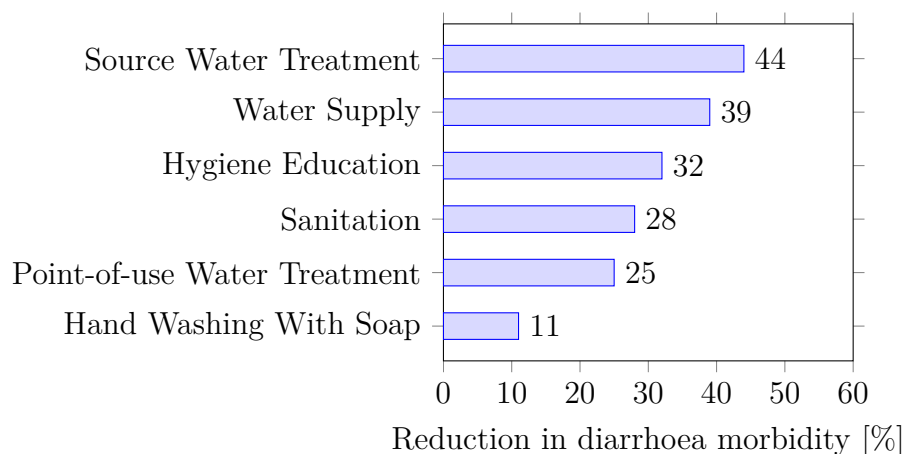


Figure 5.1: Title to a x-bar chart

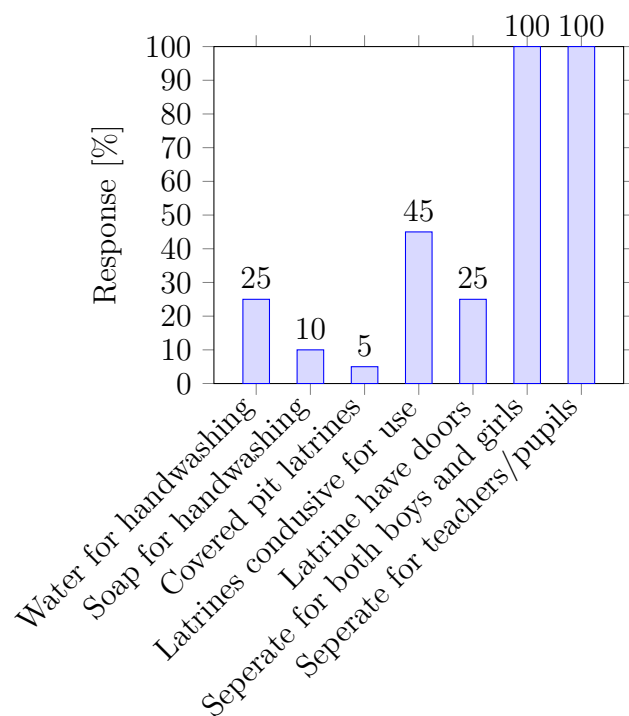


Figure 5.2: Title to a y-bar chart

Demonstration of a vertical bar chart Figure 5.2 shows an example of a vertical bar chart generated with tikzpicture (pgfplots package).

Demonstration of a stacked bar chart Figure 5.3 shows an example of a stacked bar chart generated with tikzpicture (pgfplots package).

Demonstration of a clustered bar chart Figure 5.4 shows an example of a clustered bar chart generated with tikzpicture (pgfplots package).

Demonstration of a pie chart Figure 5.5 shows an example of a pie chart generated with tikzpicture (pgf-pie package).

Demonstration of a line chart Figure 5.6 shows an example of a simple chart generated with tikzpicture (packages pgfplots and pgfplotstable). The regression is also rendered and the formula $y(x_i) = a \cdot x_i + b$ displayed. The values a and b will be stored globally.

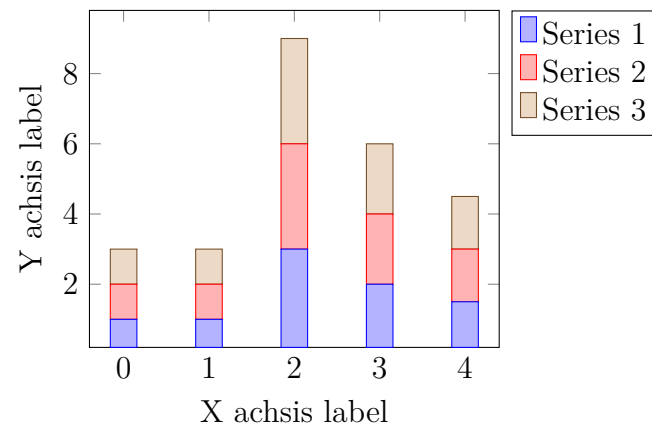


Figure 5.3: Title to a stacked bar chart

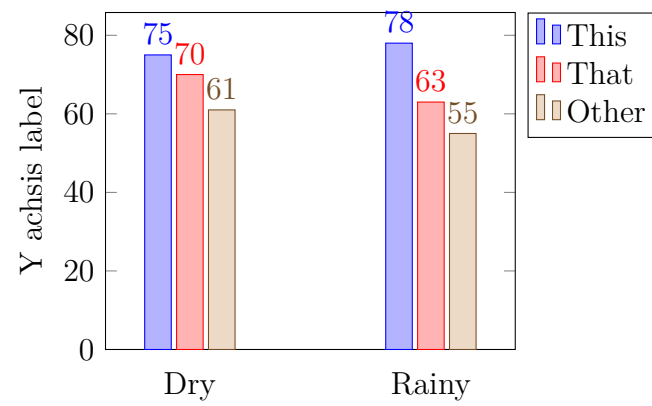


Figure 5.4: Title to a clustered bar chart

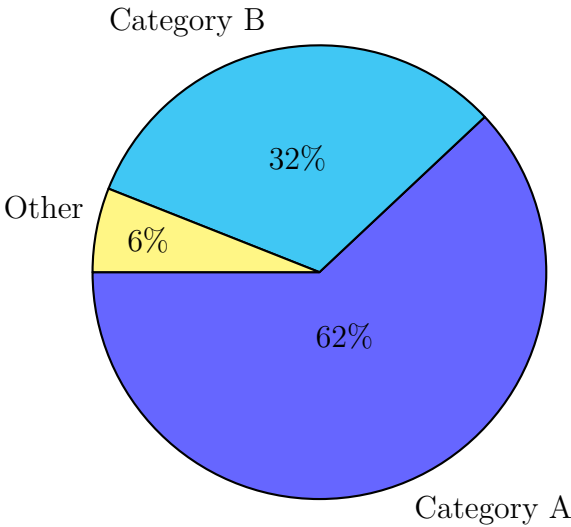


Figure 5.5: Title to the pie chart

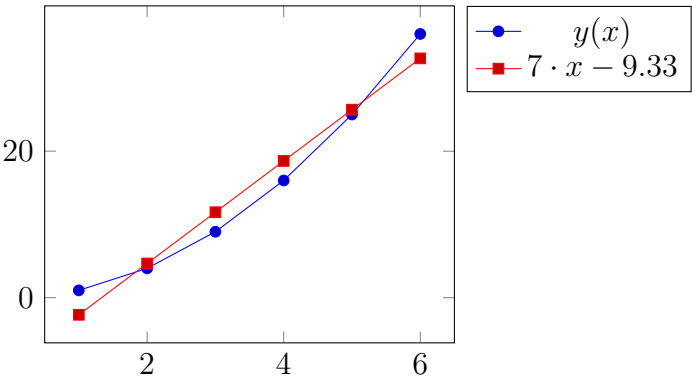


Figure 5.6: Title to the line chart

Table 5.1: Conductivity values measured for defined salinity values

Salinity [g/L]	Electrical Conductivity [mS/cm]
40	63,3
35	55,1
30	47,2
25	40,4
20	32,9
15	25,5
10	17,53
5	9,39

Demonstration of a table Table 5.1 shows an example of a table. Different parts of the Final Year Report and their corresponding weights for marking them can be viewed at table 5.2.

A help to generate LaTeX tables can be found at <https://www.tablesgenerator.com/>.

Demonstration of including a PDF Figure 5.7 shows an example of a PDF. The section displayed is of a particular page from the PDF and is cropped in size.

Demonstration of including a JPG with labels Figure 5.8 shows an example of a JPG that has some labels applied.

Demonstration of citation Table 5.3 shows some different options on how to cite a source. The examples are done using natbib package.

[2] gives some guidance on how to structure a dissertation.

Demonstration of formulas Formula 5.1 shows the geometrical projection formula for population growth. The parameters description is done using the macro *conditions*, defined at NDUmacros.tex.

The Hazen-Williams formula expressed in metric units as seen in 5.2.

Table 5.2: Module CIV4202 Final Year Report - Assessment

Category	Chapter or Feature	Weight
Engineering Content (60%)	Introduction and Objectives	10%
	Problem definition	5%
	Literature review	5%
	Methods	15%
	Results and Discussion	15%
	Conclusions and recommendations	10%
Language (25%)	Grammar and spelling	15%
	Sentence structure	10%
References (15%)	Use of references	10%
	Quality and format of references	5%

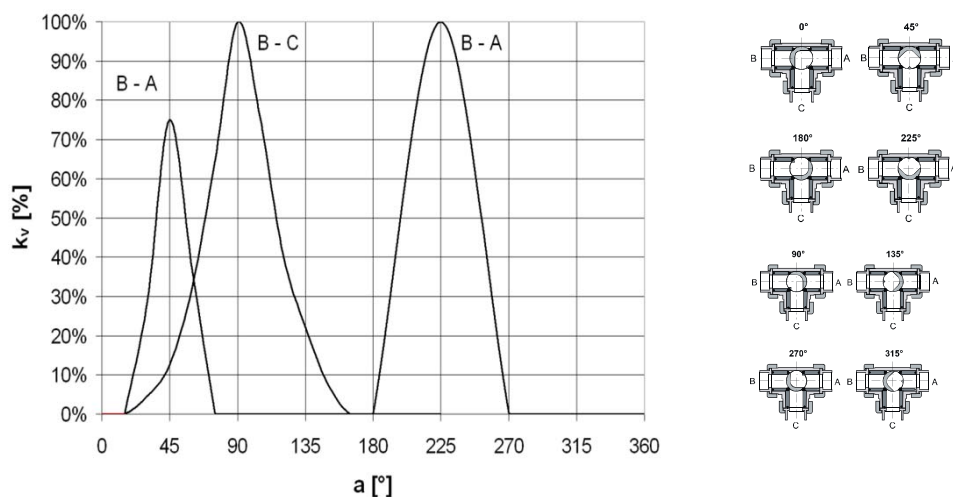


Figure 5.7: GF ball valve 543 kv-characteristic

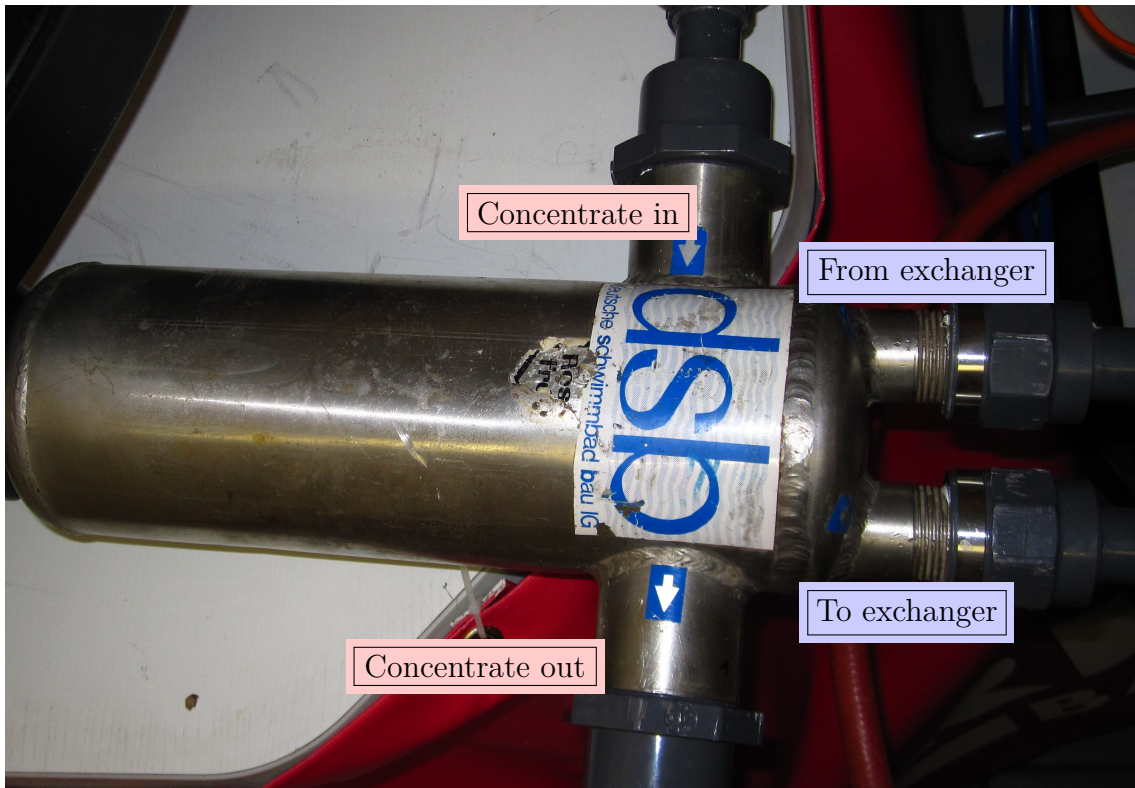


Figure 5.8: Heat exchanger with flow of media

Table 5.3: Some styles to citation

Command	Output	Description
<code>\citet{ref}</code>	[1]	Textual citation
<code>\citep[page]{ref}</code>	[1, p. 20]	Parenthetical citation
<code>\citeauthor{ref}</code>	Monippally and Pawar	Name of author
<code>\citeyear{ref}</code>	2010	Year of publication

$$P_f = P_0 \left(1 + \frac{i}{100}\right)^t \quad (5.1)$$

where:

P_f = Future population
 P_0 = Current population
 i = Growth rate in %
 t = Time in years

$$H[m] = \left(\frac{6.78L}{d^{1.165}}\right) \left(\frac{V}{C}\right)^{1.85} \quad (5.2)$$

where:

H = Headloss
 L = Length of pipe
 d = Internal diameter of pipe
 V = Flow
 C = Coefficient

Demonstration of links Use `\href{URL}{DESCRIPTION}` to add a link with description. Use `\url{URL}` to add a link without a description.

The Water Research & Development Centre's website: <https://nduwrdc.org>

Demonstration of symbols In TeXstudio instead of viewing the *Structure* in the side panel, click on *** to get a list of symbols. Once inserted a leading and trailing `$` must be placed around the symbol code. Some examples displayed using tabbing:

<code>\$\pm\$</code>	\rightarrow	\pm
<code>\$\Longrightarrow\$</code>	\rightarrow	\Longrightarrow
<code>\$\alpha\$</code>	\rightarrow	α
<code>\$\pi\$</code>	\rightarrow	π
<code>\$\mu\$</code>	\rightarrow	μ

Demonstration of a flowchart You can follow the instructions of [overleaf.com](https://www.overleaf.com/learn/latex/LaTeX_Graphics_) on creating flowcharts, https://www.overleaf.com/learn/latex/LaTeX_Graphics_

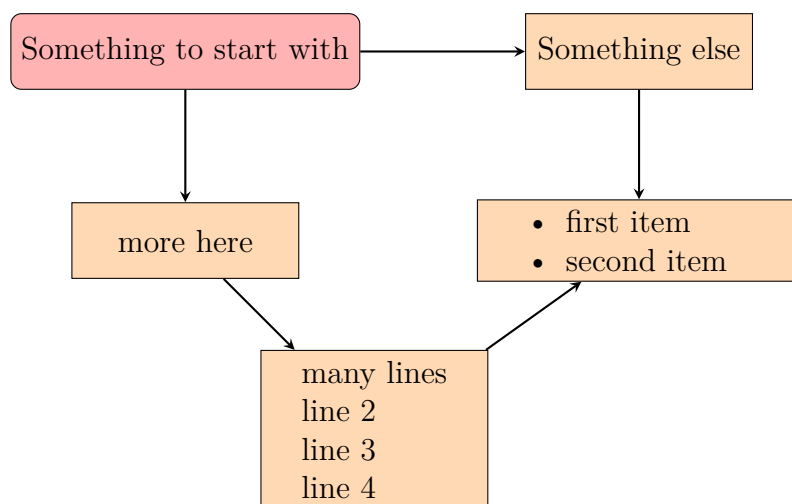


Figure 5.9: Example of a flow chart

using_TikZ:_A_Tutorial_for_Beginners_(Part_3)%E2%80%94Creating_Flowcharts, to achieve figures 5.9 and 5.10.

Demonstration of a circular diagram There is a number of examples using the `smartdiagram` package here: <https://texample.net/tikz/examples/all/>. Figure 5.11 is one of them.

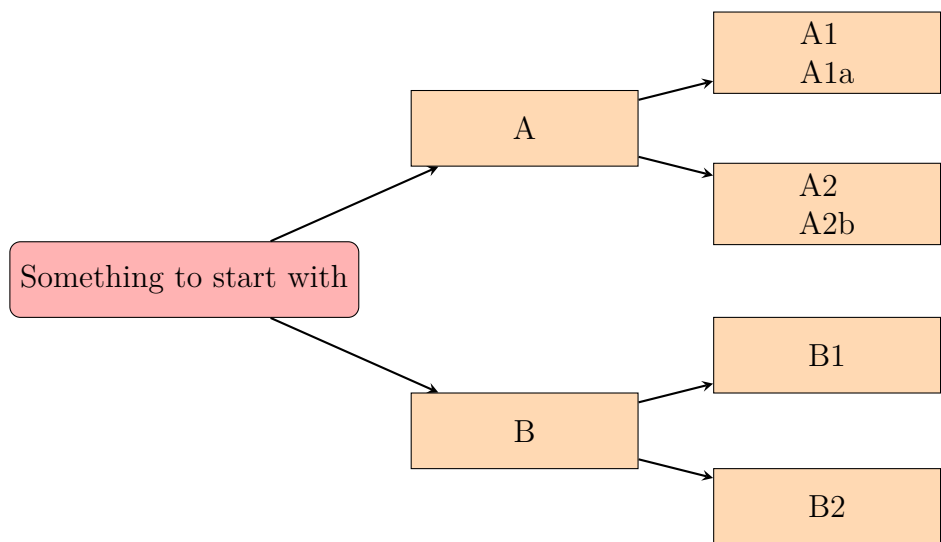


Figure 5.10: Some sort of a tree

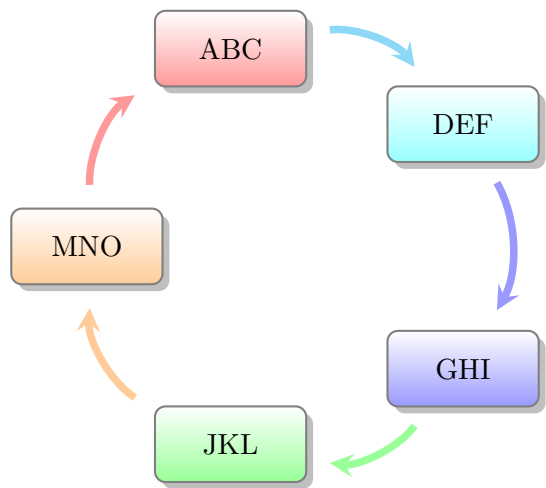


Figure 5.11: Circular diagram

Bibliography

- [1] M. M. Monippally and B. S. Pawar, *Academic Writing: A Guide for Management Students and Researchers*. Los Angeles: Response, 2010, oCLC: ocn551198634.
- [2] scribbr.co.uk, “How to Write a Dissertation | A Guide to Structure & Content,” <https://www.scribbr.co.uk/category/thesis-dissertation/>, 2020, library Catalog: www.scribbr.co.uk.