Faculty of Engineering & Survey
Department of Civil Engineering

Final Year Project Report Proposal

Title of Project can use a maximum of 3 lines

Subtitle if needed can use a maximum of 3 lines

LastName1, FirstNames1
Registration Number1

LastName2, FirstNames2
Registration Number2

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

Supervised by First supervisor, Second supervisor

May 2021

Abstract

This is a succinct summary of your proposal report. The maximum word count should be 300. The abstract 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. The abstract for the project proposal should consists:

- *A clear and concise statement of the objectives.*
- *Scope of the project.*
- *The methods to use to solve the problem.*
- *Expected results.*

Contents

List of Tables

List of Figures

List of Symbols, Acronyms and Abbreviations

ADT Atlantic Daylight Time.

UTC Coordinated Universal Time.

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.

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 (journals, text books, newspapers, 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 four objectives.

1.4 Research Question (or Hypothesis)

Research questions are questions that your research must answer and thus they should be generated from the objectives. For effectiveness, all students must have not more than four (4) research questions.

1.5 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.

1.6 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.*

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.

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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2.3 Topic Three

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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.*

3.1 Topic One

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4 Expected Results

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.

4.1 Topic One

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5 References

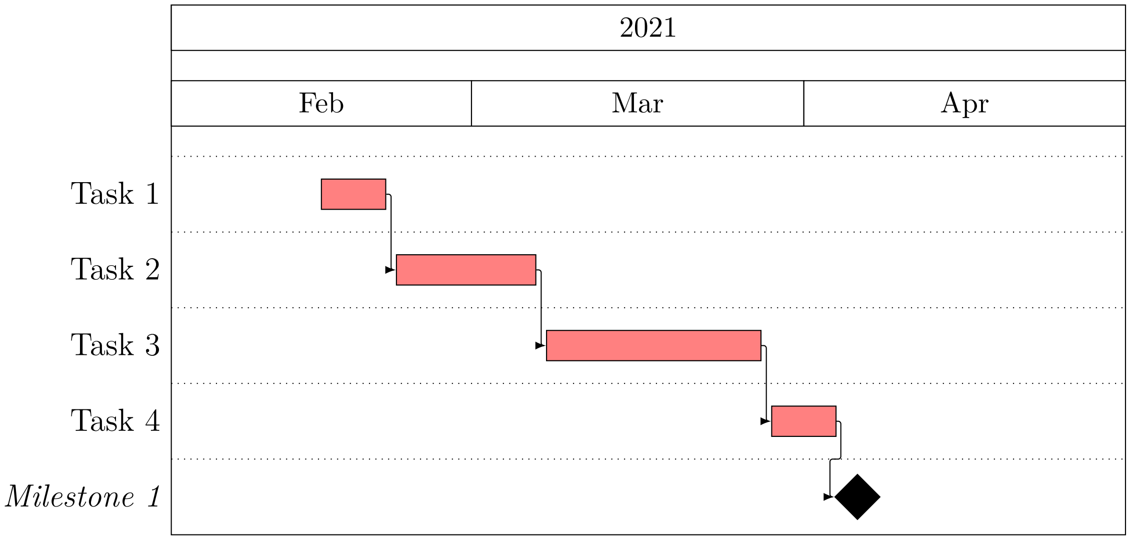
[1] M. M. Monippally and B. S. Pawar, *Academic Writing: A Guide for Management Students and Researchers*. Los Angeles: Response, 2010, OCLC: ocn551198634, ISBN: 978-81-321-0441-4.

[2] I. Bouchrika. "How to Write Research Methodology: Overview, Tips, and Techniques," Guide2Research. (Oct. 16, 2020), [Online]. Available: https://www.guide2research.com/research/how-to-write-research-methodology (accessed May 5, 2021).

[3] L. T. Choy, "The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches," *IOSR Journal of Humanities and Social Science*, vol. 19, no. 4, pp. 99–104, 2014, ISSN: 22790845, 22790837. DOI: 10.9790/0837-194399104. [Online]. Available: http://www.iosrjournals.org/iosr-jhss/papers/Vol19-issue4/Version-3/N0194399104.pdf (accessed May 5, 2021).

[4] M. T. Holden and P. Lynch, "Choosing the Appropriate Methodology: Understanding Research Philosophy," *The Marketing Review*, vol. 4, no. 4, pp. 397–409, Dec. 1, 2004, ISSN: 1469347X, 00000000. DOI: 10.1362/1469347042772428. [Online]. Available: http://www.ingentaselect.com/rpsv/cgi-bin/cgi?ini=xref&body=linker&reqdoi=10.1362/1469347042772428 (accessed May 5, 2021).

6 Activity Plan



7 Budget

Table 7.1: Proposed budget

Item	Description	Unit	Quantity	Rate (Shs.)	Amount (Shs.)
1	Food		2	10,000	20,000
2	Drinks		2	1,000	2,000
3	Ghost writer		1	478,000	478,000
	TOTAL				**500,000**

Appendix: Some LaTeX examples

This section is to be deleted/commented by the author.

Demonstration of citation Table 7.2 shows some different options on how to cite a source. The examples are done using the `biblatex` package.

Table 7.2: Some styles to citation

Command	Output	Citation
`\cite{ref}`	[1]	Bare
`\textcite[page]{ref}`	Monippally and Pawar [1, p. 20]	Textual
`\parencite[chapter]{ref}`	[1, chap. 4]	Parenthetical
`\citeauthor{ref}`	Monippally and Pawar	Name
`\citeyear{ref}`	2010	Year

In his introduction to research methodology writing, Bouchrika refers to some articles [2]–[4].

Demonstration of abbreviations Define a glossary entry in file `Acronyms.tex`:
`\newacronym{utc}{UTC}{Coordinated Universal Time}`
Use a glossary entry: `\gls{utc}`
This LaTeXcode `\gls{utc}␣is␣3␣hours␣behind␣\gls{adt}.`
will produce:
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.

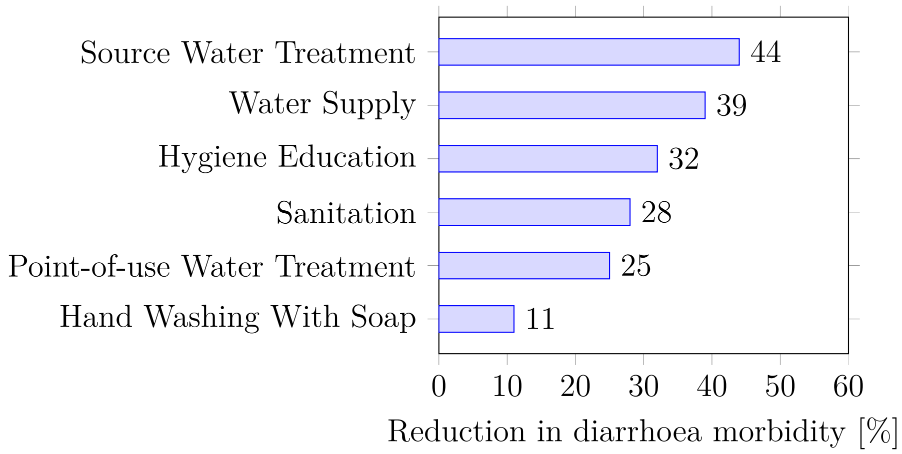


Figure 7.1: Title to a x-bar chart

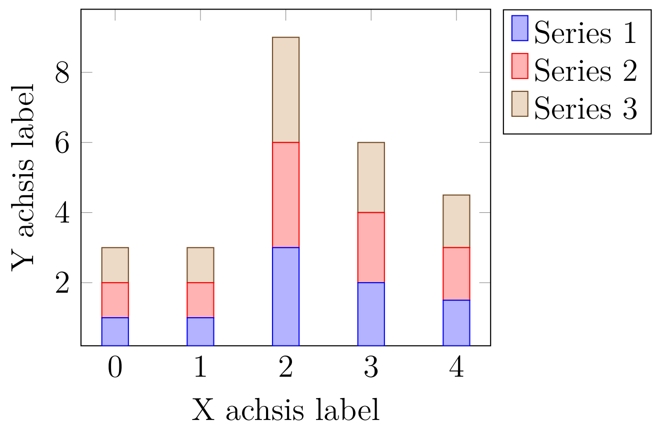


Figure 7.2: Title to a stacked bar chart

Demonstration of a horizontal bar chart Fig. 7.1 shows an example of a horizontal bar chart generated with tikzpicture (pgfplots package).

Demonstration of a stacked bar chart Fig. 7.2 shows an example of a stacked bar chart generated with tikzpicture (pgfplots package).

Demonstration of a vertical bar chart Fig. 7.3 shows an example of a vertical bar chart generated with tikzpicture (pgfplots package).

Demonstration of a clustered bar chart Fig. 7.4 shows an example of a clustered bar chart generated with tikzpicture (pgfplots package).

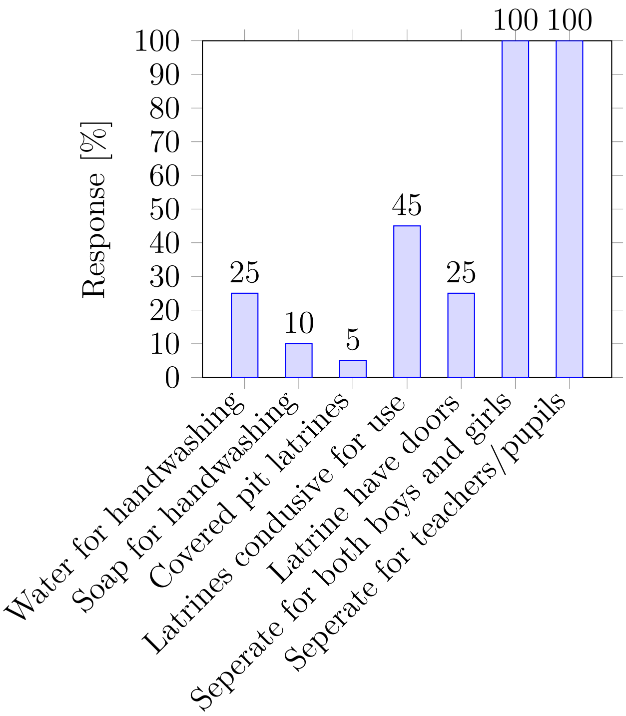


Figure 7.3: Title to a y-bar chart

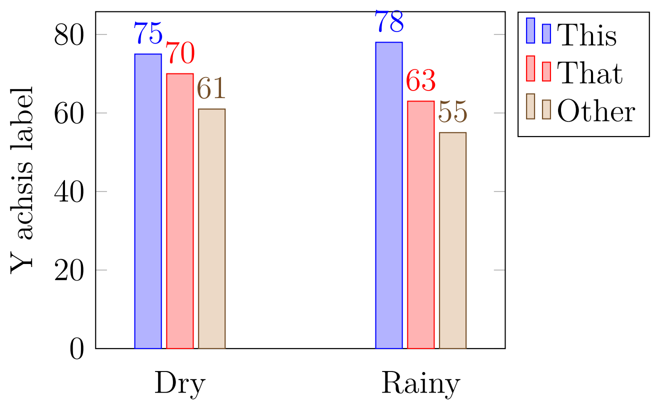


Figure 7.4: Title to a clustered bar chart

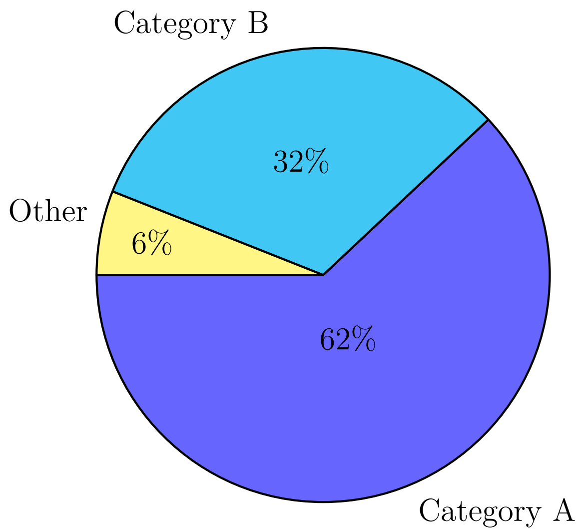


Figure 7.5: Title to the pie chart

Demonstration of a pie chart Fig. 7.5 shows an example of a pie chart generated with tikzpicture (pgf-pie package).

Demonstration of a line chart Fig. 7.6 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.

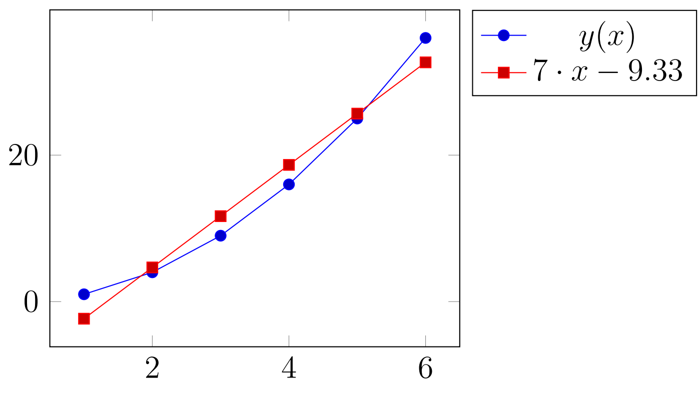


Figure 7.6: Title to the line chart

Table 7.3: 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 7.3 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 7.4. A help to generate LaTeX tables can be found at `https://www.tablesgenerator.com/`.

Demonstration of including a section of a PDF Fig. 7.7 shows an example of a PDF. The section displayed is of a particular page from the PDF and is cropped in size.

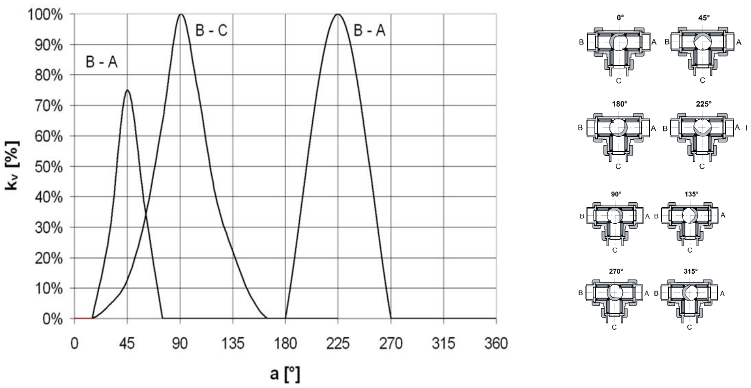


Figure 7.7: GF ball valve 543 kv-characteristic

Table 7.4: 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%

Demonstration of including a graphics Fig. 7.8 shows an image stored as jpg-file. The file is limited to the page width and is rotated by 90°. Because of the rotation 'height' becomes 'width'.

Figure 7.8: Thermometers showing different temperature readings.

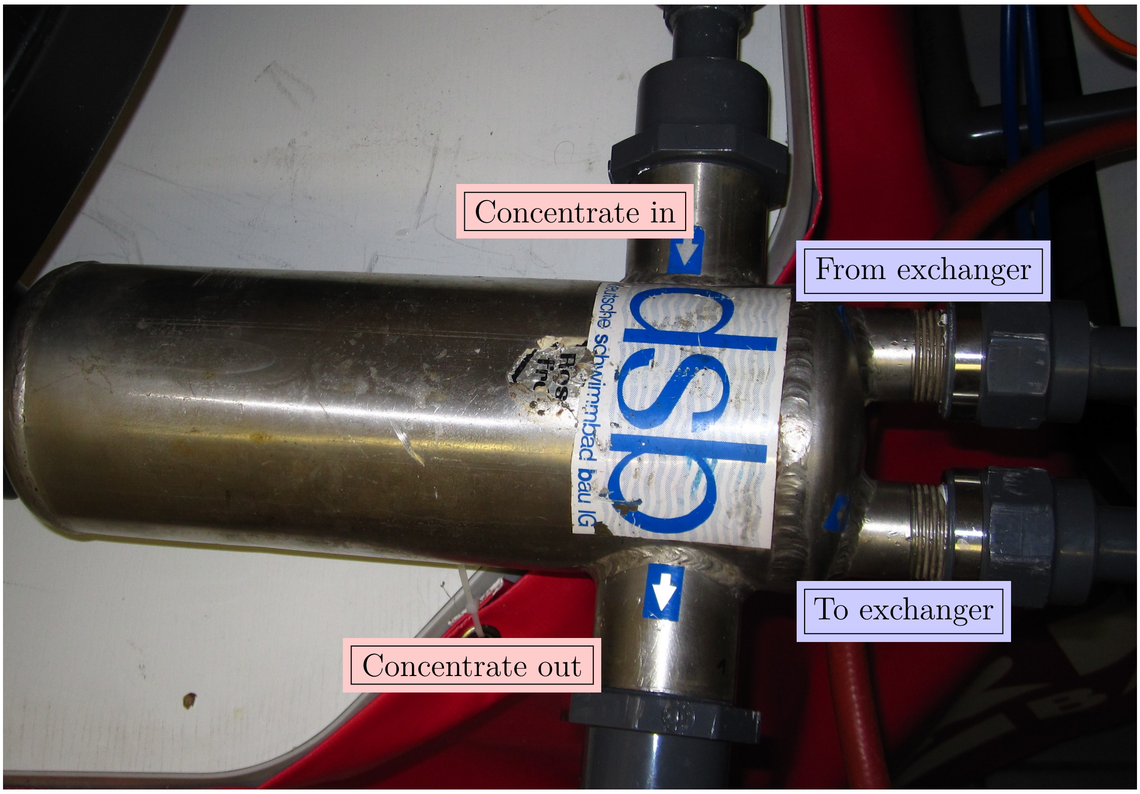


Figure 7.9: Heat exchanger with flow of media

Demonstration of including a JPG with labels Fig. 7.9 shows an example of a JPG that has some labels applied.

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`
Very long urls with hyphens are also possible:
`http://www.emarketer.com/blog/index.php/quick-stat-smartphone-users-account-38-mobile-phone-users/`

Demonstration of equations Equation (7.1) shows the geometrical projection formula for population growth. The parameters description is done using the macro *conditions*, defined at `NDUmacros.tex`.

$$P_f = P_0(1 + \frac{i}{100})^t \tag{7.1}$$

where:

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

The Hazen-Williams formula expressed in metric units as seen in (7.2) is used to calculate the headloss.

$$H[m] = \left(\frac{6.78L}{d^{1.165}}\right)\left(\frac{V}{C}\right)^{1.85} \tag{7.2}$$

where:

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

Demonstration of mathematical operations It is possible to calculate within LaTeX. In the process, variables can be used to make it easier to modify.

With values for R=0.6m, n=0.013, S=0.0025, (7.3) will result in v=2.736m/s. The user defined macro `\showcalculation` (`NDUmacros.tex`) is also available for calculations: $\frac{1.0}{0.013}0.6^{2/3}0.0025^{1/2} = 2.736$

$$v = \frac{1.0}{n} R^{2/3} S^{1/2} \tag{7.3}$$

where:

v = velocity in m/s
R = hydraulic radius in m
n = Manning roughness coefficient (dimensionless)
S = slope of the energy grade line (dimensionless)

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:

`$\pm$`	$\rightarrow$	$\pm$
`$\Longrightarrow$`	$\rightarrow$	$\Longrightarrow$
`$\alpha$`	$\rightarrow$	α
`$\pi$`	$\rightarrow$	π
`$\mu$`	$\rightarrow$	μ

Demonstration of flowcharts You can follow the instructions of `overleaf.com` on creating flowcharts, `https://www.overleaf.com/learn/latex/LaTeX_Graphics_using_TikZ:_A_Tutorial_for_Beginners_(Part_3)%E2%80%94Creating_Flowcharts`, to achieve Fig. 7.10 and 7.11.

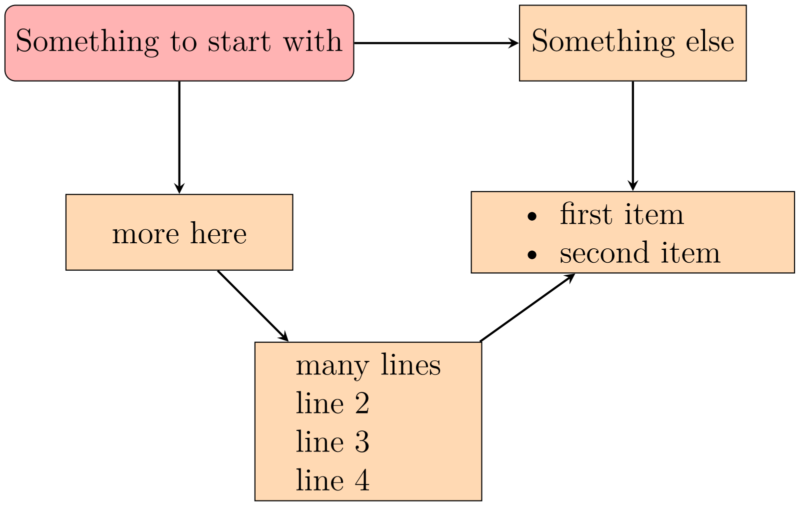


Figure 7.10: Example of a flow chart

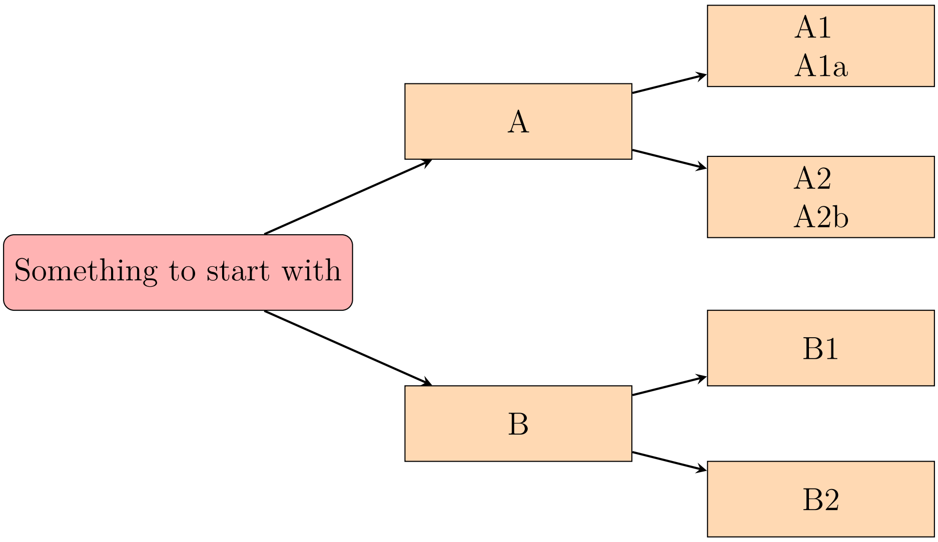


Figure 7.11: Some sort of a tree

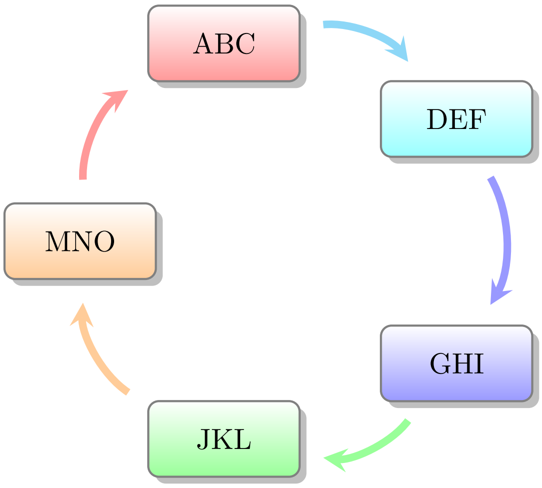


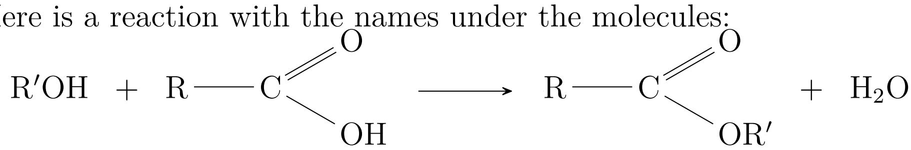
Figure 7.12: Circular diagram

Demonstration of a circular diagram There is a number of examples using the smartdiagram package here: `https://texample.net/tikz/examples/all/`. Fig. 7.12 is one of them.

Demonstration of chemical equations and molecules Package `mhchem` provides commands for typesetting chemical molecular formulae and equations:

$2\ Mg_{(s)} + O_{2(g)} \longrightarrow 2\ MgO_{(s)}$

Package `chemfig` supports the drawing of molecules in 2D and 3D. Here is a reaction with the names under the molecules:



Alcohol Carboxylic acid Ester Water