TECHNICAL REPORT

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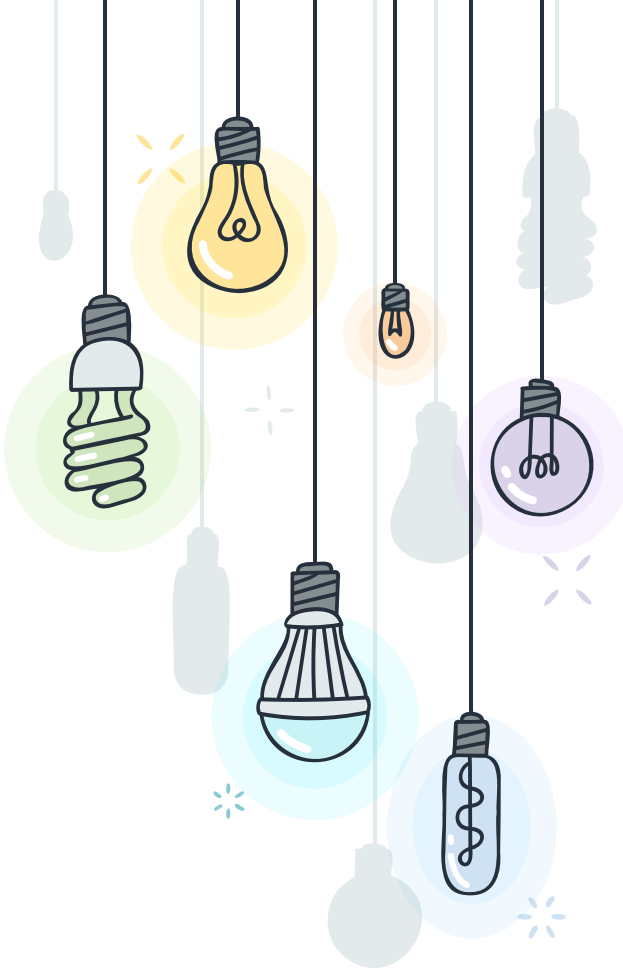
1

Part 1:

What is a Technical Report?

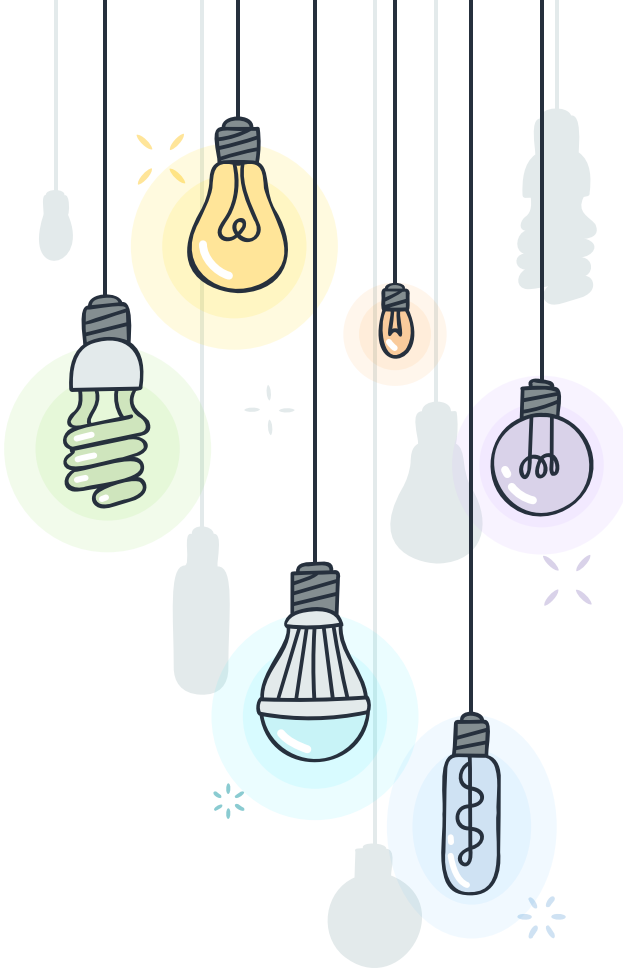
Technical Report

- A technical report can either act as a cherry on top of your project or can ruin the entire dough. Everything depends on how you write and present it.
- A technical report is a sole medium through which the audience and readers of your project can understand the entire process of your research or experimentation.



Technical Report

- **Technical Report** shows the three things of scientific research, i.e., progress, process, and result.
- It also can have some conclusions.
- It contains less information but it is technical.
- Unless the technical report is published in a peer-review journal, they are not peer-reviewed.



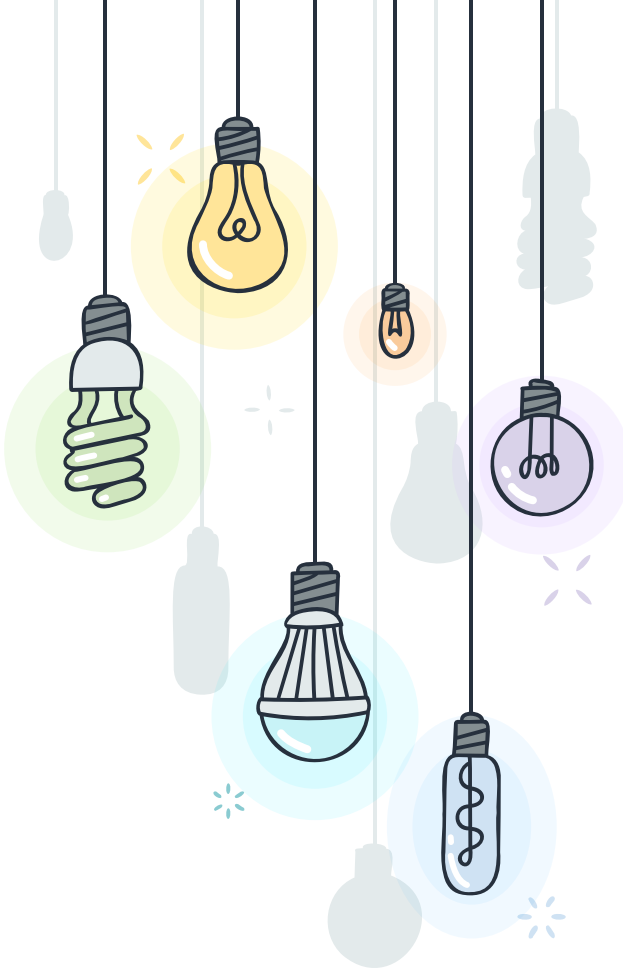
Technical Report

- In industry, technical reports are used to communicate technical information. This information helps in the process of decision making.
- Normally, if we talk about an organization, it is written by a junior to senior.
- In short – A direct, informative, and concise language written specifically for an identified audience.

Academic Writing VS Technical Writing

1 Proving vs. Instructing

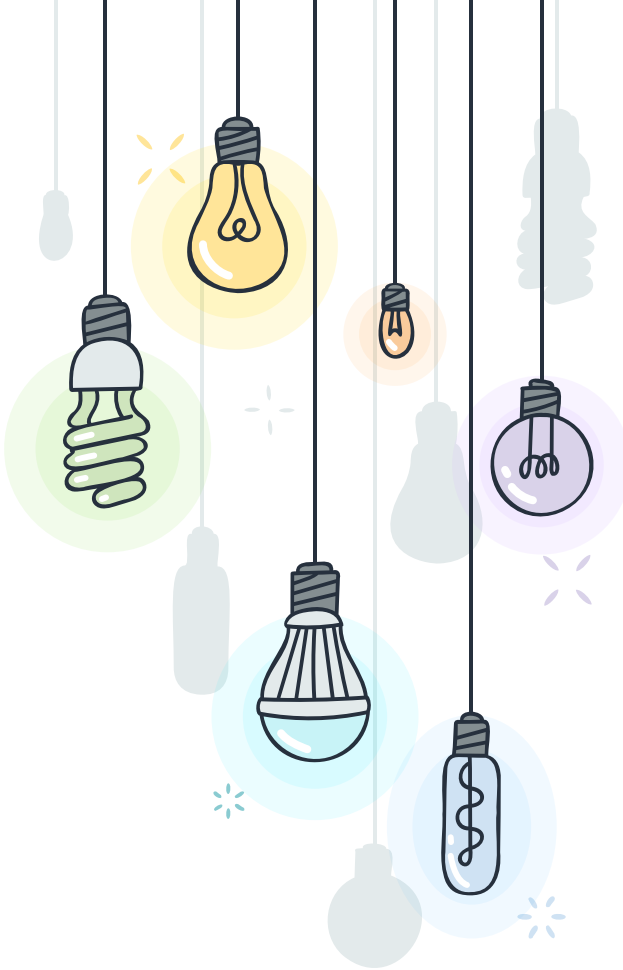
Academic writing is all about proving something in one way or the other. Technical writing, on the other hand, is all about instructing how to do something to achieve a specific goal.



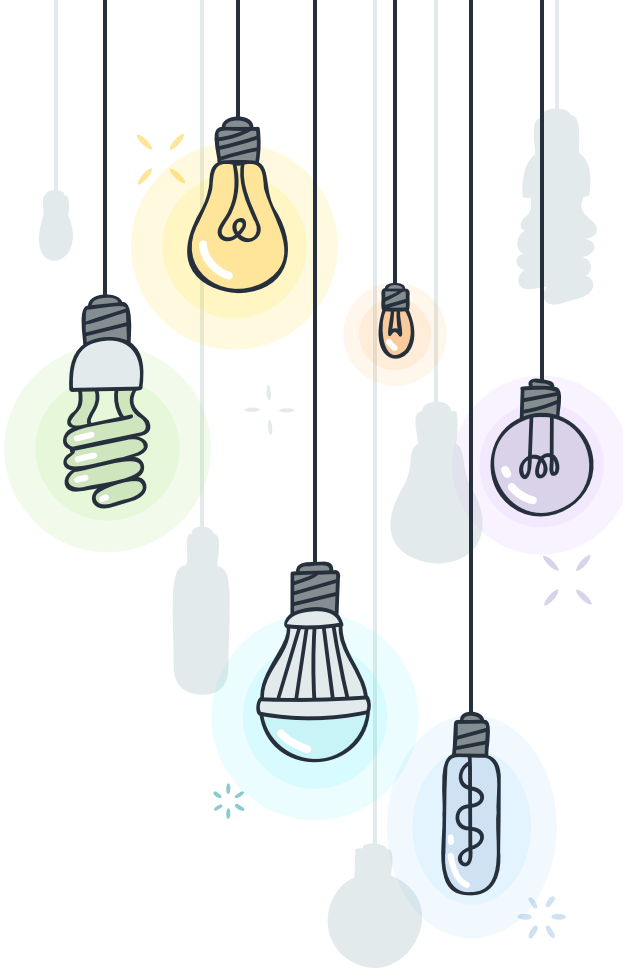
Academic Writing VS Technical Writing

Knowledge vs. Solution

Academic writing aims at expanding our knowledge of the world. Technical writing, on the other hand, aims at offering solutions to specific problems that we are faced with in the world.



Academic Writing VS Technical Writing

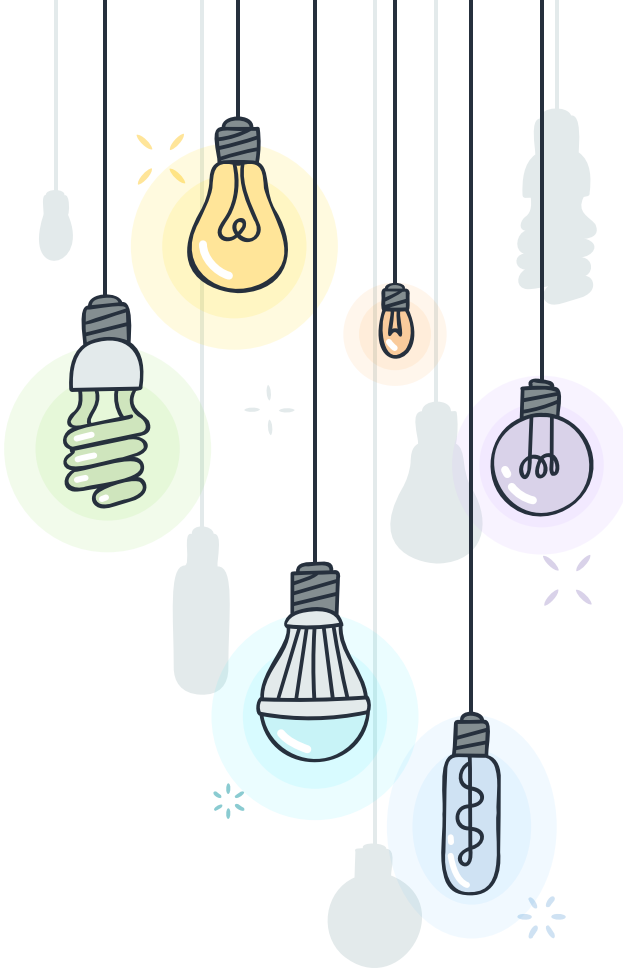


3 Win Argument vs. Change Behaviour

Academic writing tries to win a rational argument by offering evidence, precedence, and reference. Technical writing, on the other hand, tries to change our behavior by instructing us on the logical steps through which we can complete a task successfully.

Technical Report

- A technical report is a document created by a researcher that discusses the project's outcomes and is delivered to the project's sponsor.
- It is defined as a written technical document that gives accurate and evidence-based information.



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Part 2:

What are the Characteristics of A Good Technical Report?

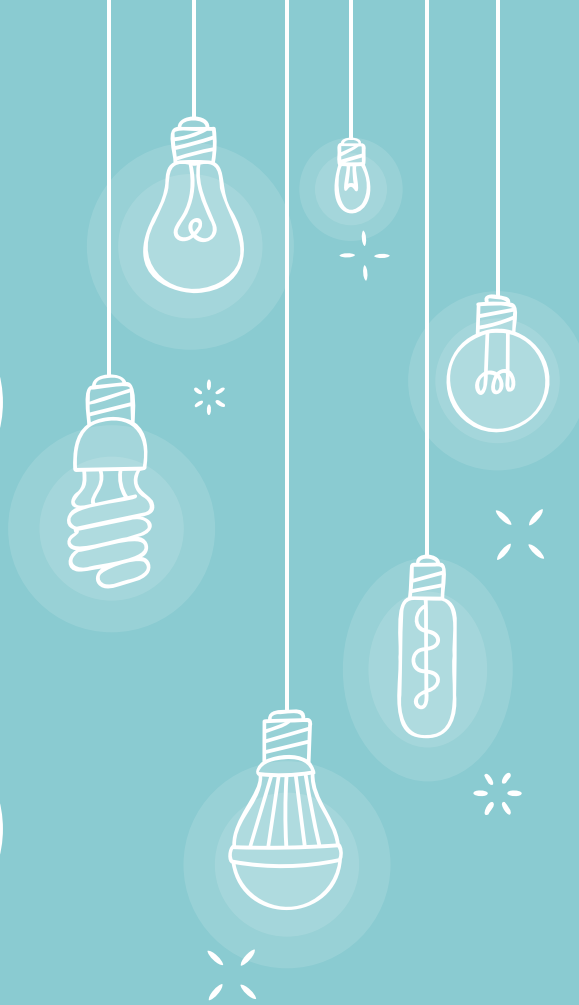
Qualities of a Good Technical Report

Correctness

Accuracy

Clarity

Accessibility

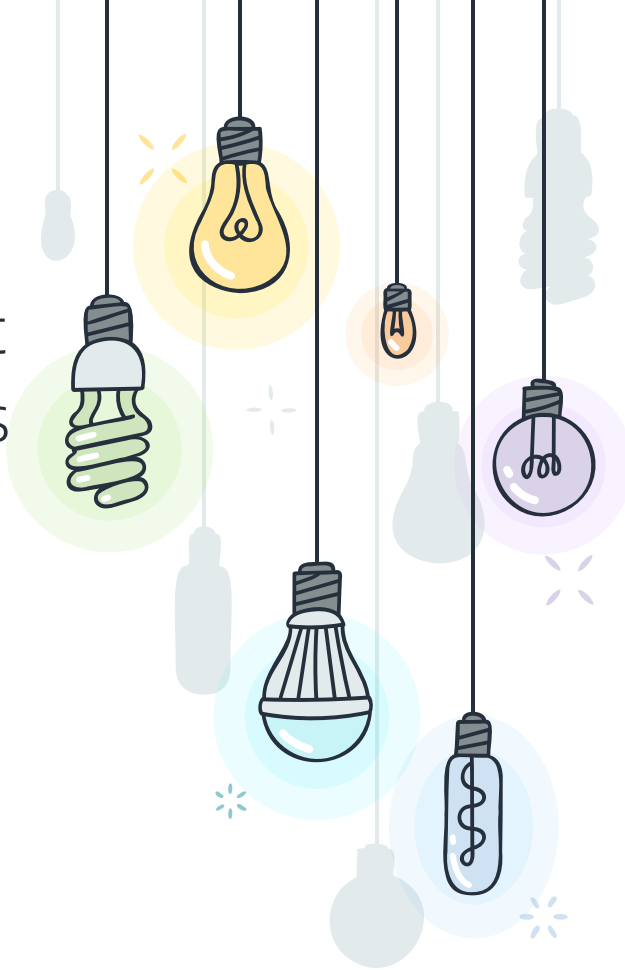


Characteristics of A Technical Report

- They can include data, design criteria, techniques, literature reviews, study history, extensive tables, illustrations/images, and explanations of failing attempts.
- They may be published before the relevant journal literature and may contain additional or different information than the following journal article.

Characteristics of A Technical Report

- Since the sponsor already understands that it may have restricted access, there may be less background information.
- Technical reports are classified and export-controlled.
- As part of the identifying information, there may be complex abbreviations and codes.



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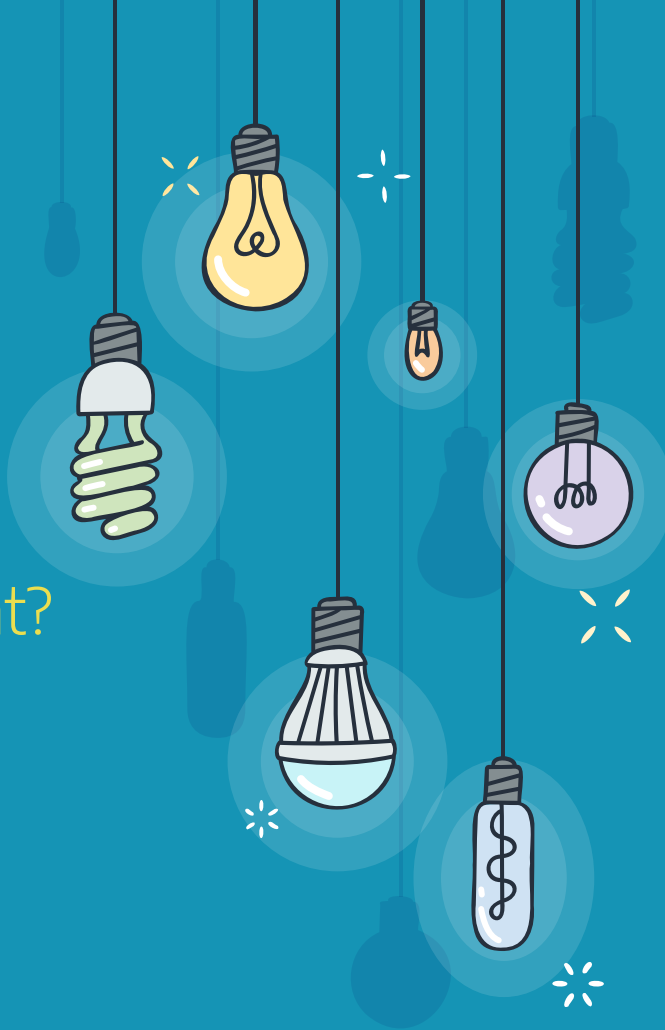
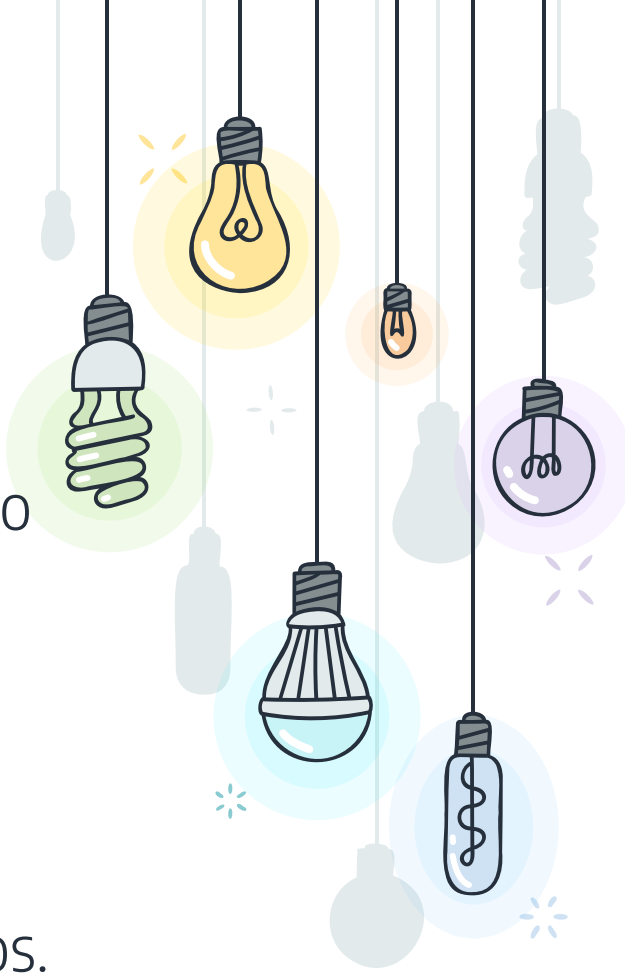
Part 3:

Why is A Technical Report Important?



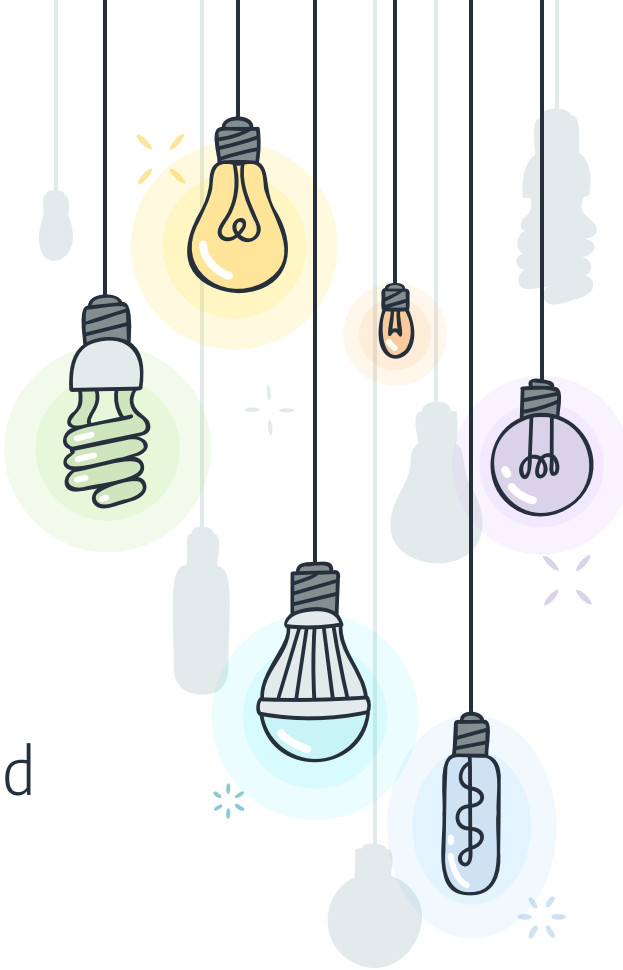
Efficient Communication

- Technical reports are used by industries to convey pertinent information to upper management. This information is then used to make crucial decisions that would impact the company in the future.
- Examples of such technical reports include proposals, regulations, manuals, procedures, requests, progress reports, emails, and memos.



Evidence for Your Work

- Most of the technical work is backed by software.
- However, graduation projects are not.
- So, if you're a student, your technical report acts as the sole evidence of your work. It shows the steps you took for the research and glorifies your efforts for a better evaluation.



Organized the Data

- A technical report is a concise, factual piece of information that is aligned and designed in a standard manner. It is the one place where all the data of a project is written in a compact manner that is easily understandable by a reader.
- It is ideal to have a table of contents, a list of images, a glossary, and an index.

Tool for Evaluation of Your Work

- Professors and supervisors mainly evaluate your research project based on the technical write-up for it. If your report is accurate, clear, and comprehensible, you will surely bag a good grade.
- A technical report to research is like Robin to Batman. Best results occur when both of them work together.

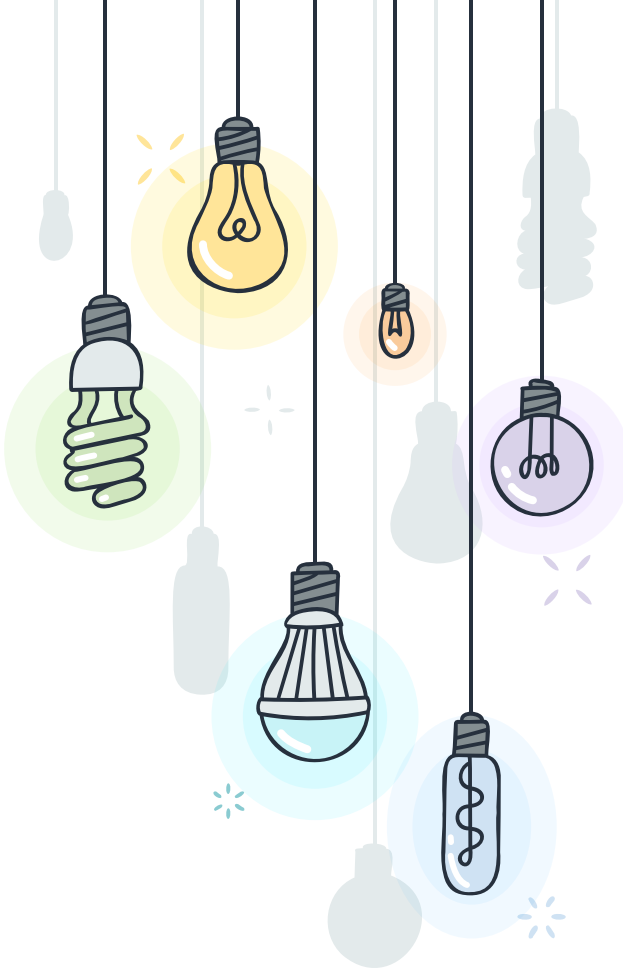
4

Part 4:

How to Write A Technical Report?

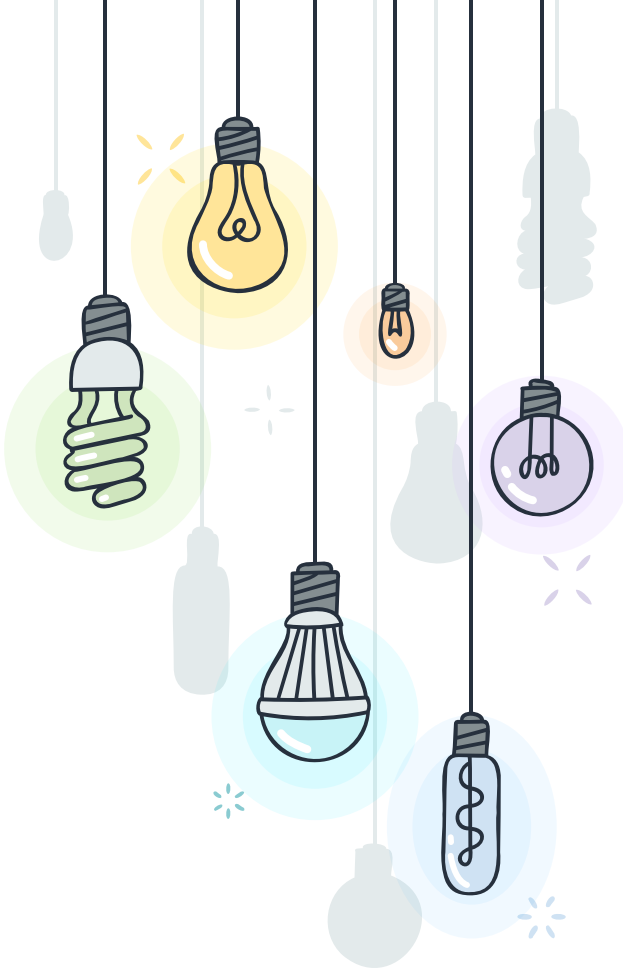
Approach

- **Top-down approach:** Structure the full report from start to finish, from title to sub-titles to conclusion, and add the details in the appropriate sections. The top-down approach creates a structured flow for your mental process, which helps in time management.



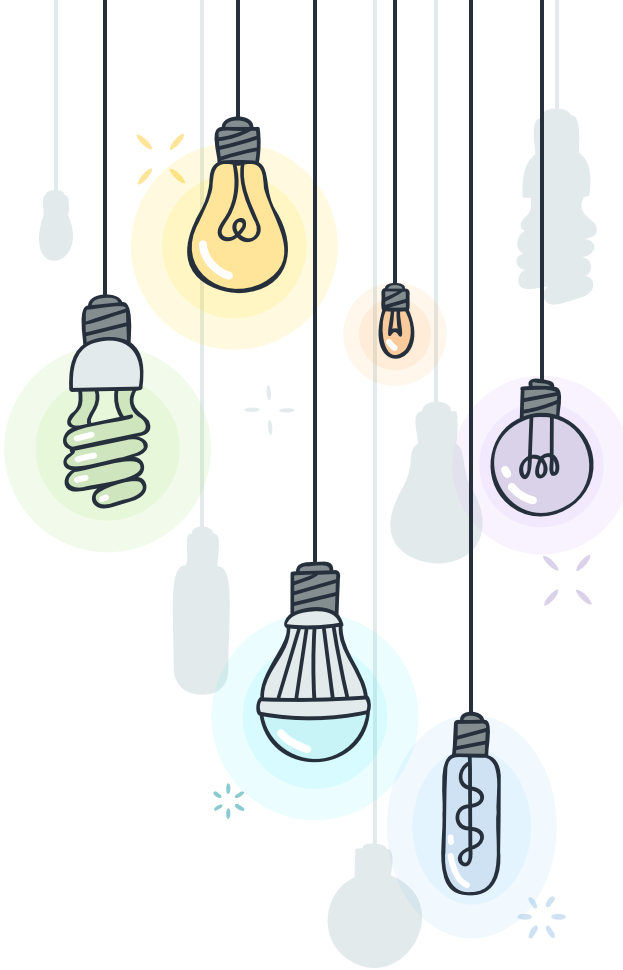
Approach

- **Evolutionary delivery:** This method is suitable for someone who likes to go with the flow. As the project develops, the author writes and makes decisions. Evolutionary delivery broadens the thinking capabilities. When a new idea or inspiration comes, you can even add and alter certain areas.

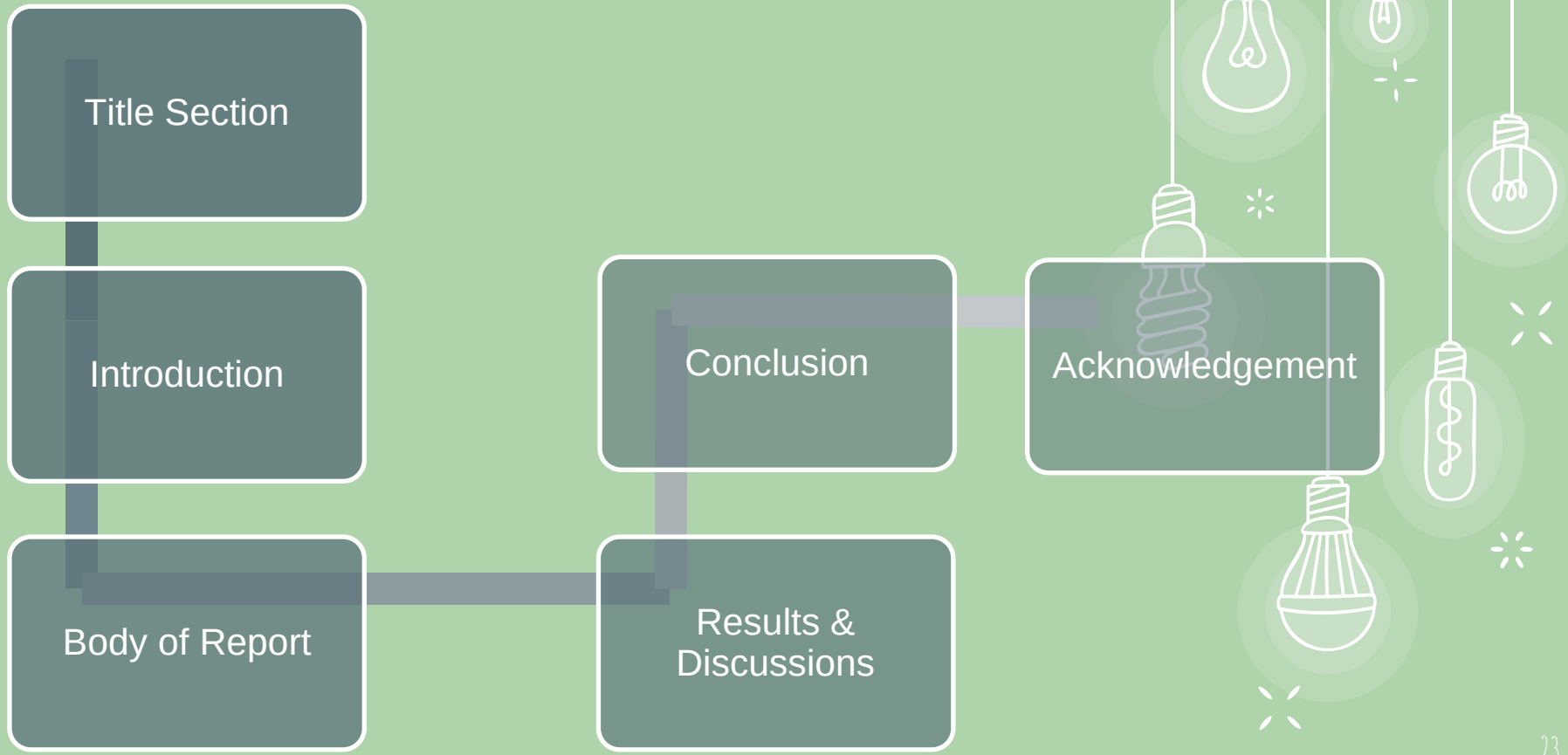


Structure

- A technical report should have a clearly defined format that is easy to follow and explains the goal of the technical report.

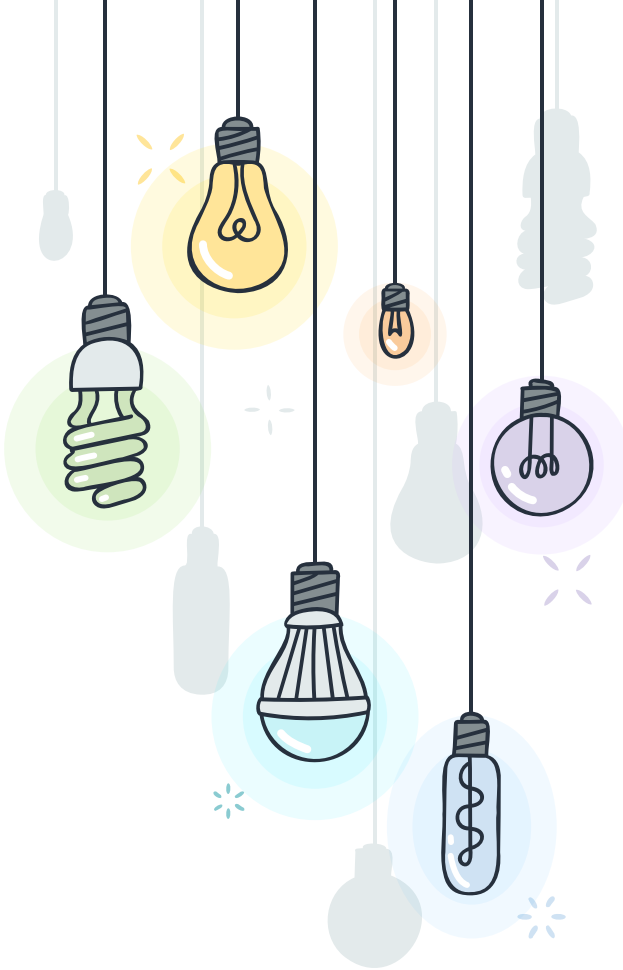


Essential Contents of a Good Technical Report



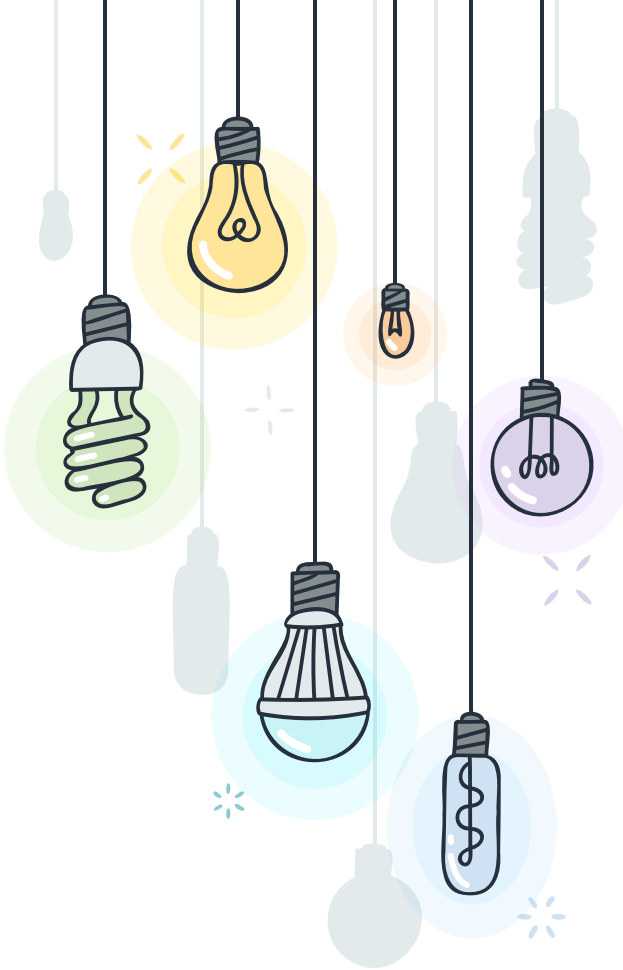
Structure

- **Cover page:** The cover page is the project's face. As a result, it should have details such as the title, author's name, and the organization's name together with its symbol. It should be a straightforward but engaging layout.



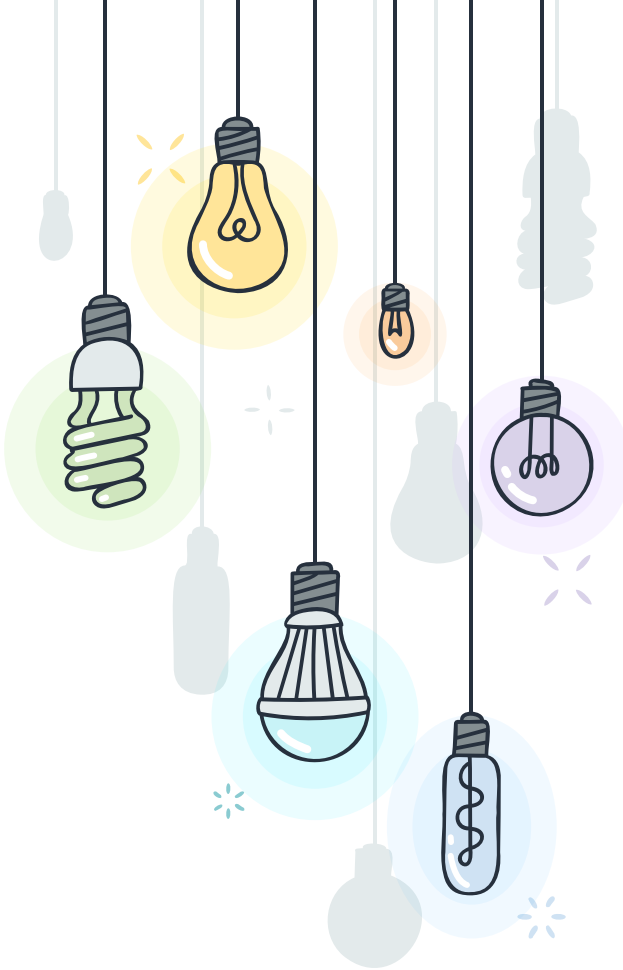
Structure

- **Title page:** The title page is where the word count has been provided. The word length and the primary text word count are frequently required. The reader is also informed about the project's status on the title page. This page also includes the name of the mentor or supervisor.



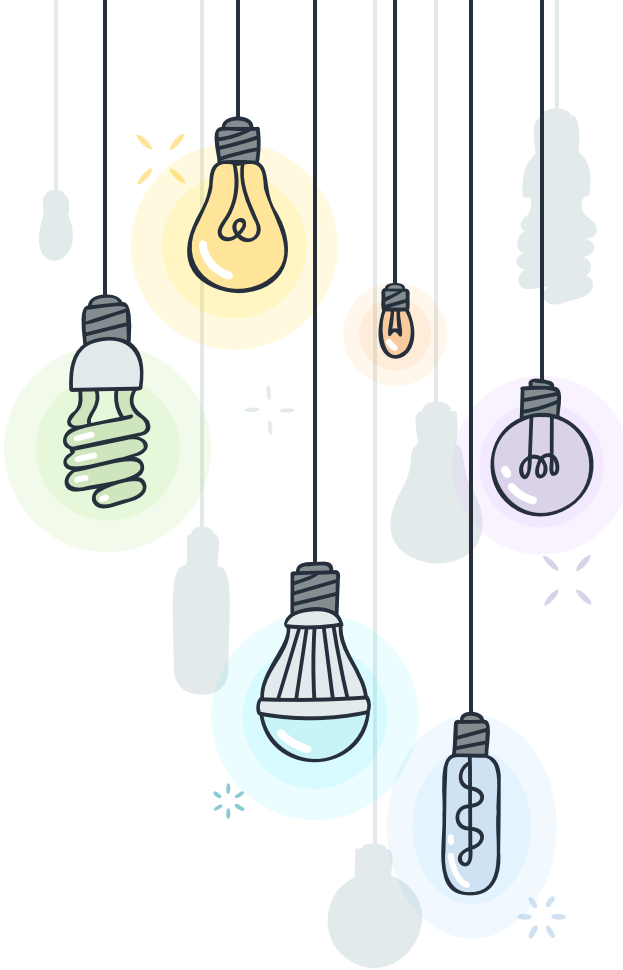
Structure

- **Abstract:** Abstract provides a clear and brief description of the project. It is written so that a person who solely reads the abstract can learn everything about the project.



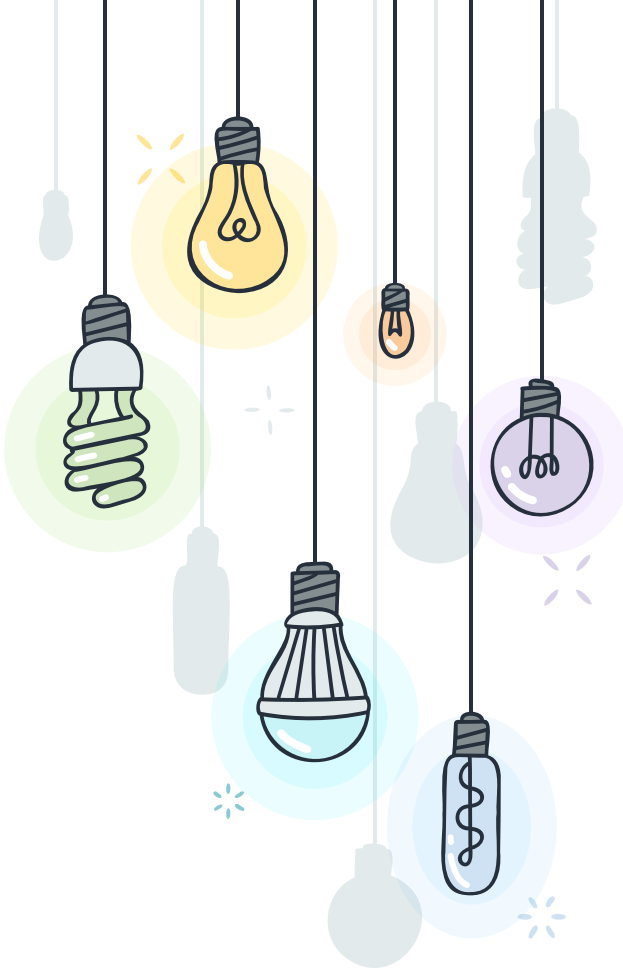
Structure

- **Preface:** The preface is the page on which you state that all sources have been appropriately credited and that no section of your research has been copied. Your findings are the result of your experiments and study.



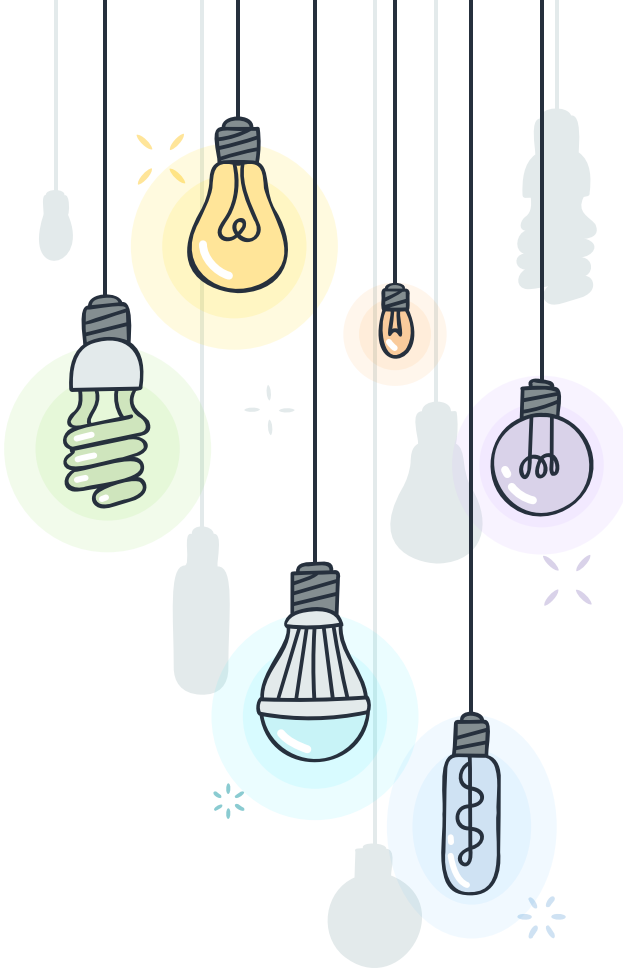
Structure

- **Dedication:** When an author wishes to dedicate their study to a loved one, this is an additional page to do so. It's a single sentence right in the middle of a fresh page.



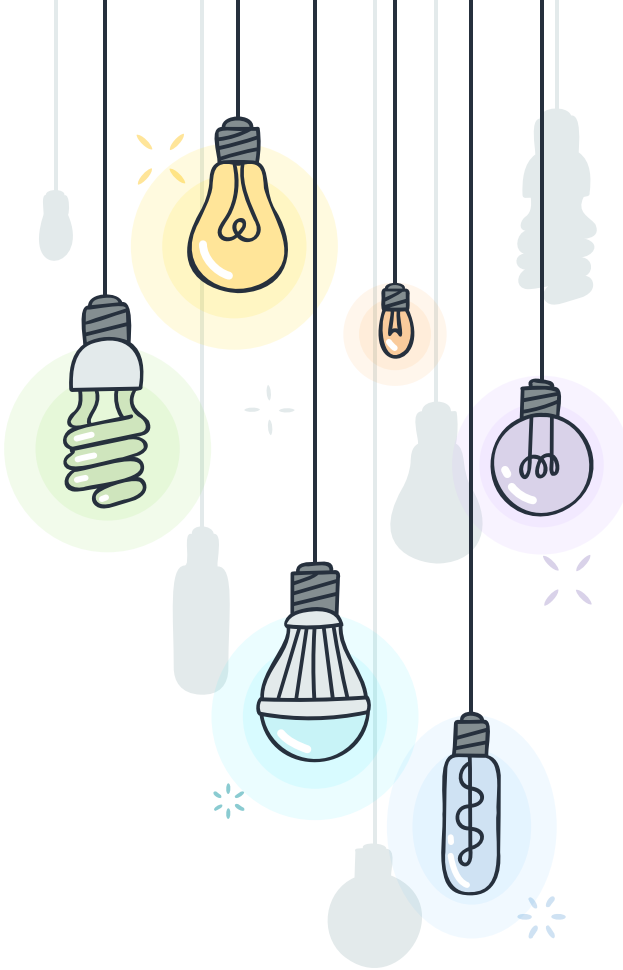
Structure

- **Acknowledgment:** In the acknowledgment section, you thank the persons, organizations, and parties who assisted you in the process or inspired you to start it.



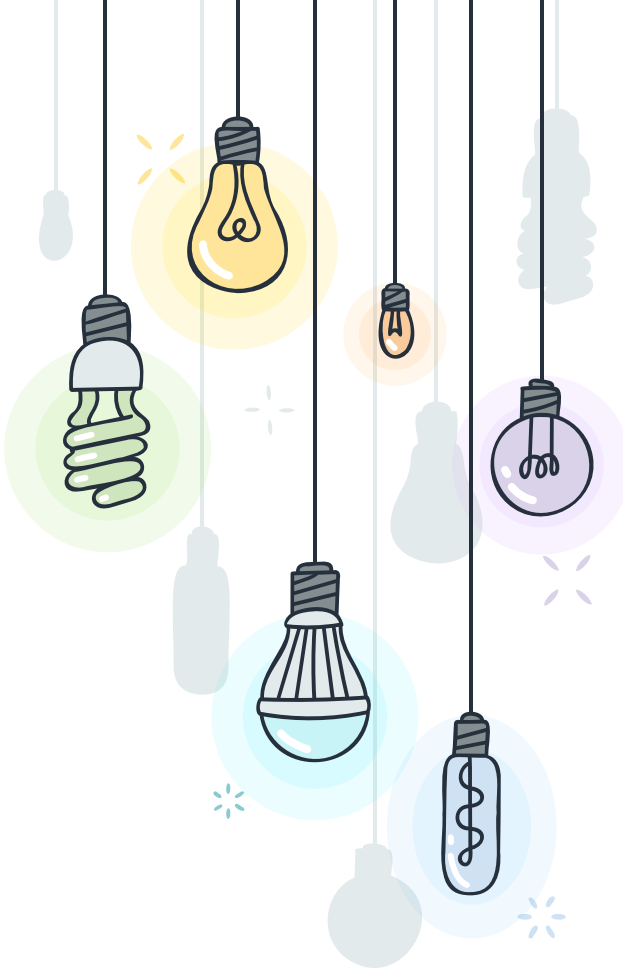
Structure

- **Table of contents:** The table of contents is where page numbers are listed next to all section and subsection titles. Make a page for describing any symbols you have used. If the technical report has graphs and tables, they also require a new page. The symbols and illustrations are to be listed on a new page.



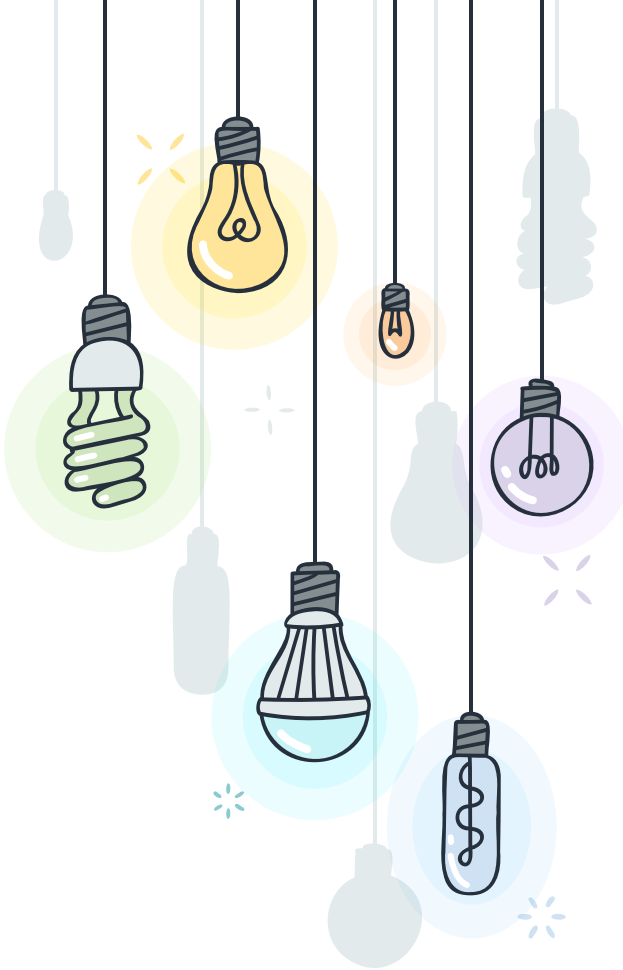
Structure

- **Introduction:** The introduction states the report's goals and suggests how the report's subject should be handled. The introduction takes you straight to the report.



Structure

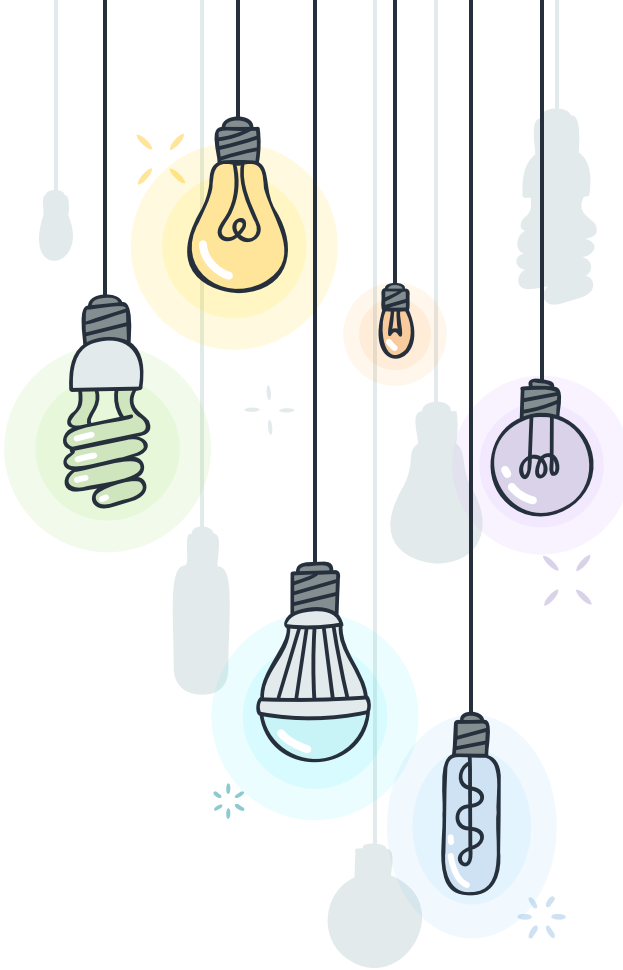
- **Body:** The sections of the body are numbered and headed. These sections organize and divide the several primary themes in a reasonable order.
- Each chapter should be clearly defined with sub and sub-sub sections if needed. Every section should serve a purpose.



Structure

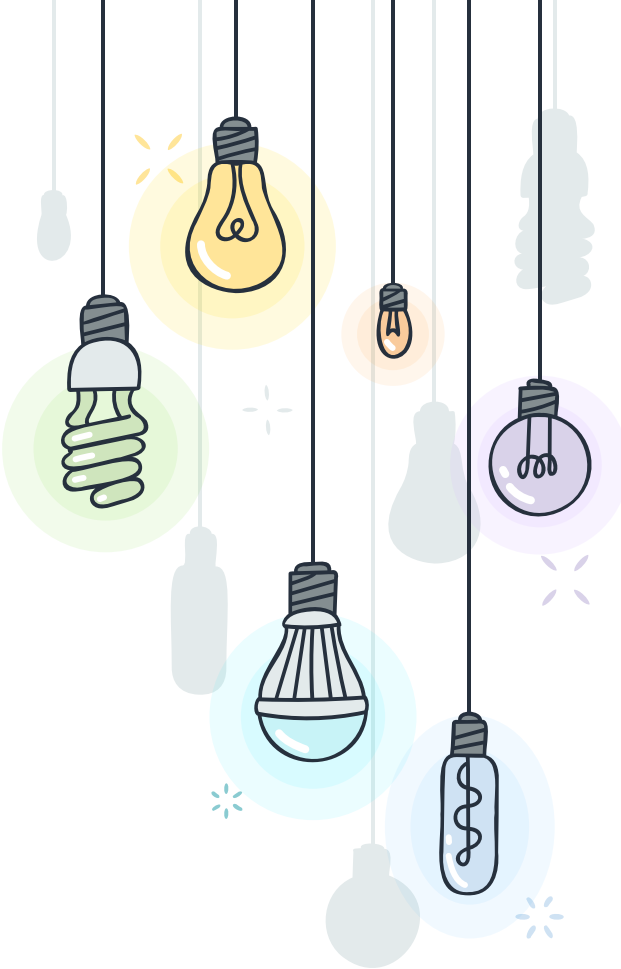
While writing the central chapter, keep in mind the following factors:

- Clearly define the purpose of each chapter in its introduction.
- Any assumptions you are taking for this study should be mentioned.
- Results you portray must be verifiable and not based upon your opinion
- Each conclusion drawn must be connected to some central chapter.



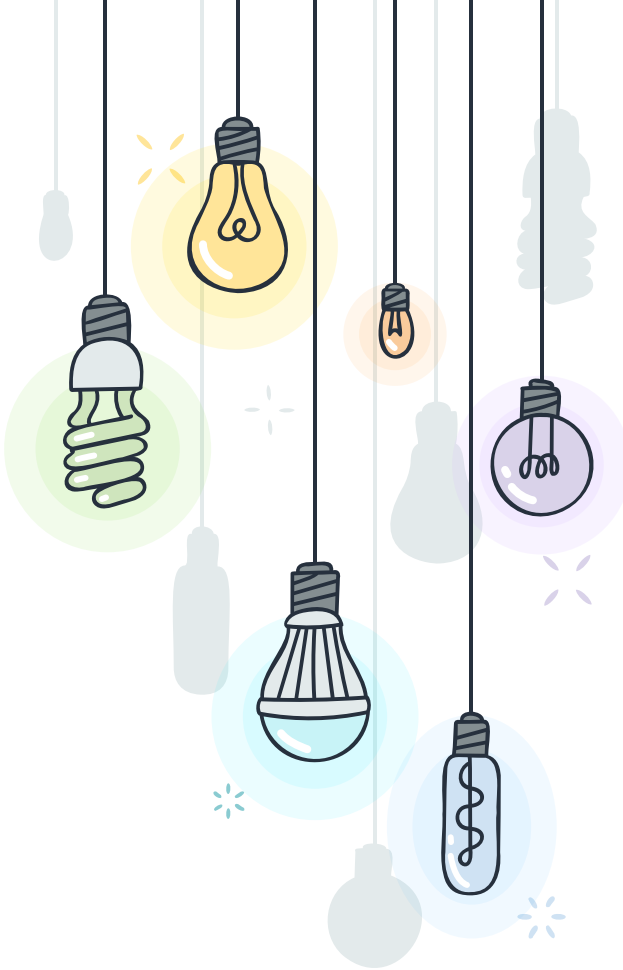
Structure

- **Conclusion:** The conclusion's goal is to wrap up everything that is discussed in the project. Mention the findings of each chapter, the goals that were met, and the degree to which the goals were met. Discuss the consequences of the findings as well as the importance of the research.



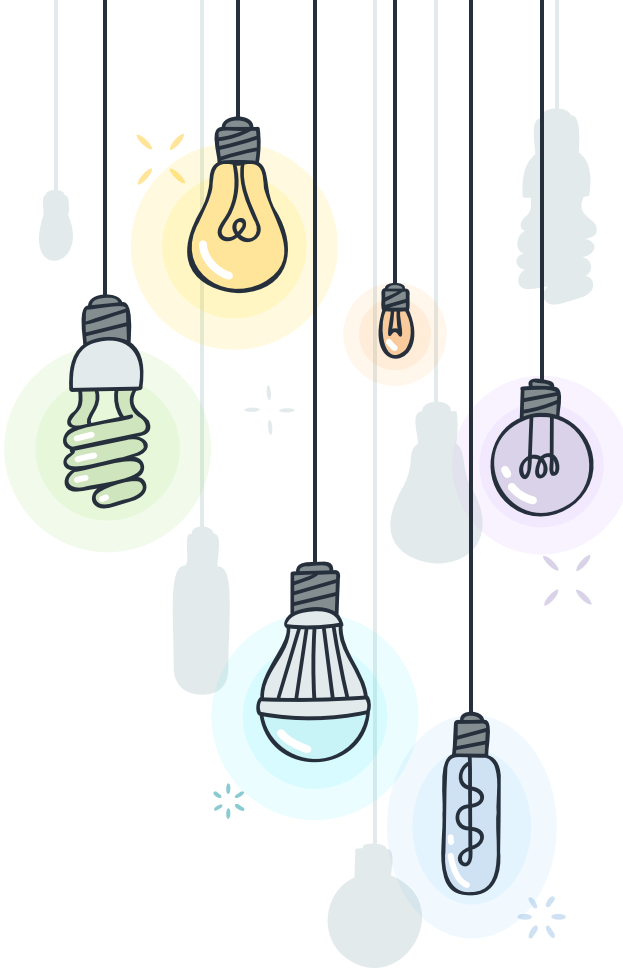
Structure

- **References:** The reference section contains published sources of information cited to or quoted in the book.
- **Bibliography:** In bibiliography, other sources of information, such as websites that are not mentioned in the text but are helpful for background or additional reading, are stated.



Presentation

- It should be printed on A4 paper, single-sided.
- The report's margins should be consistent throughout.
- The title, summary, and contents pages should not be numbered.
- All additional pages should be numbered sequentially, beginning with 1.

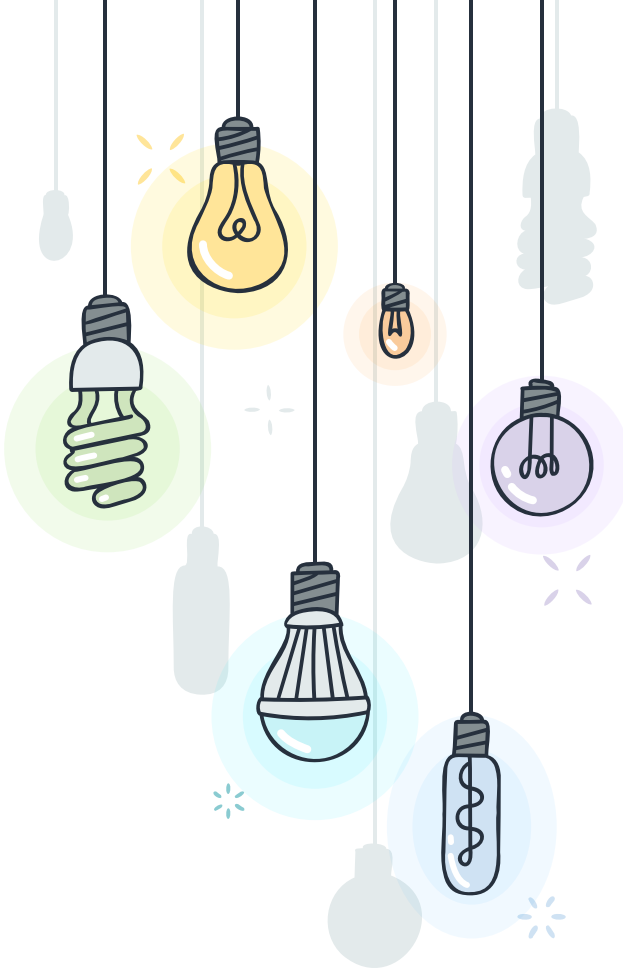


Presentation

- Binders can be used for more extended reports (e.g., a year three project report).
- At least 2.54 cm must be left on all four margins.
- Print, microform, and digital editions are available.
- Older table rows can have been scanned and are available on the Internal network in full text.
- Newer table rows should be digital from the start.

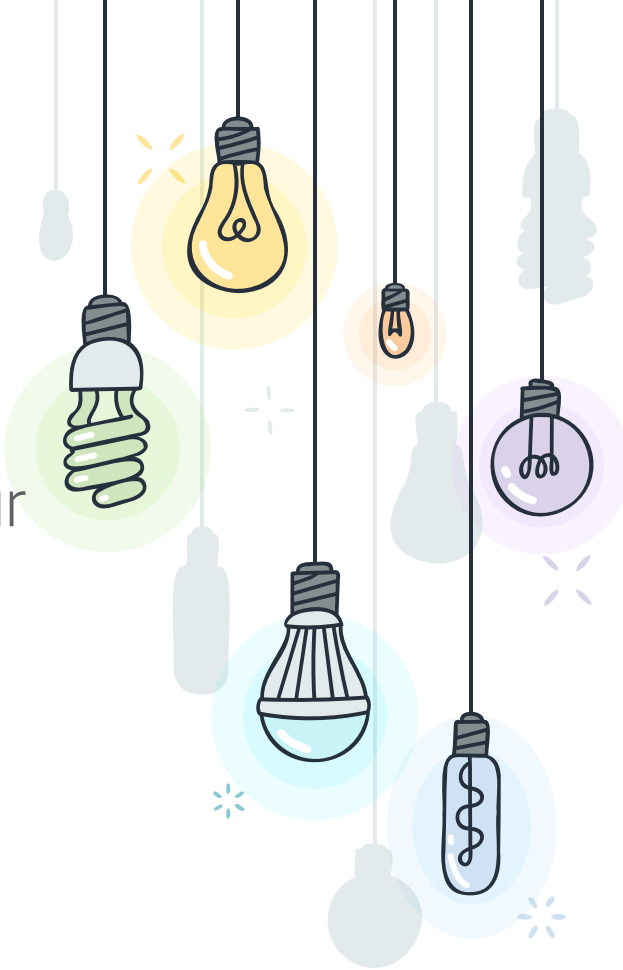
Style

- Avoid using slang or informal words. For instance, use ‘cannot’ instead of can’t.
- Use a third-person tone and avoid using words like I, Me.
- Each sentence should be grammatically complete with an object and subject.
- Two sentences should not be linked via a comma.



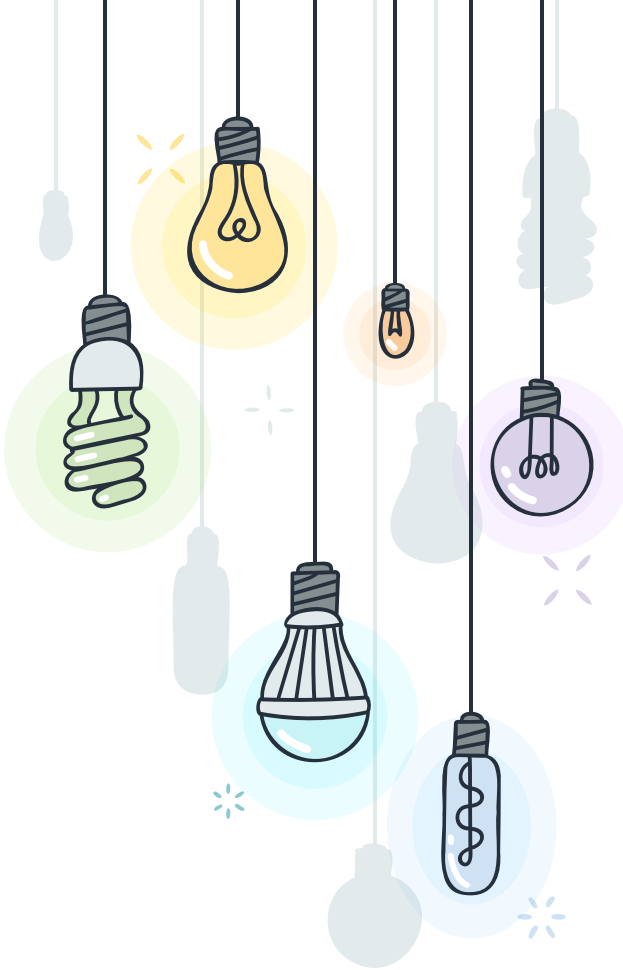
Style

- Avoid the use of passive voice.
- Readers should be kept in mind while writing. Avoid giving them instructions. Your work is to make their work of evaluation easier.
- Tenses should be carefully employed. Use present for something that is still viable and past for something no longer applicable.



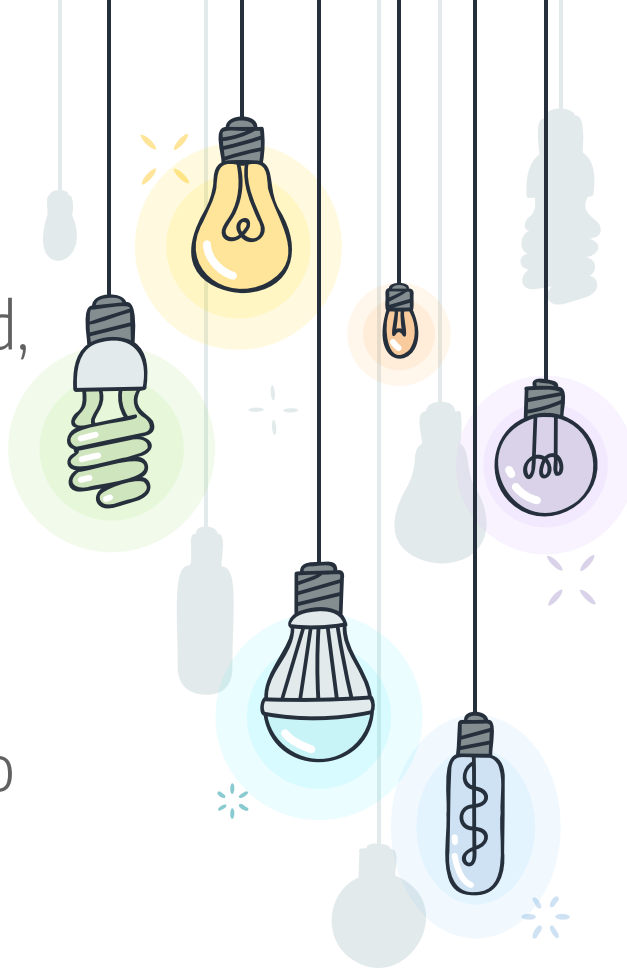
Style

- Procedural, narrative, calculations = past tense
- Theory and principles, stating known fact = present tense
- Prior event = past perfect tense
- Rarely used in technical report = future tense
- Best to pick a style and be consistent – frequent shifting leave the reader confused



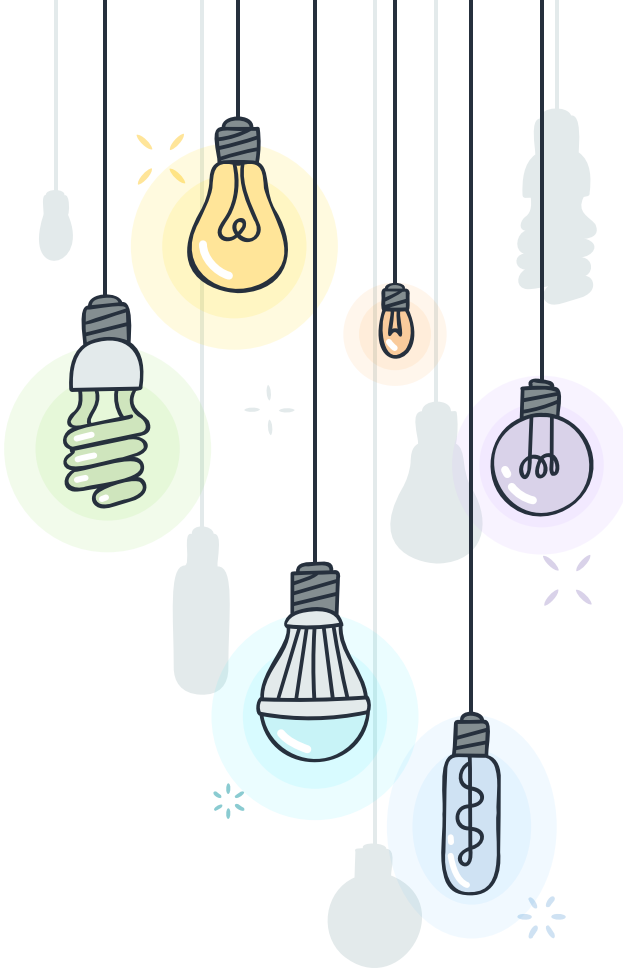
Style

- Abbreviations should be avoided and if used, the full form should be mentioned.
- Understand the difference between a numbered and bulleted list. Numbering is used when something is explained sequence-wise. Whereas bullets are used to just list out points in which sequence is not important.



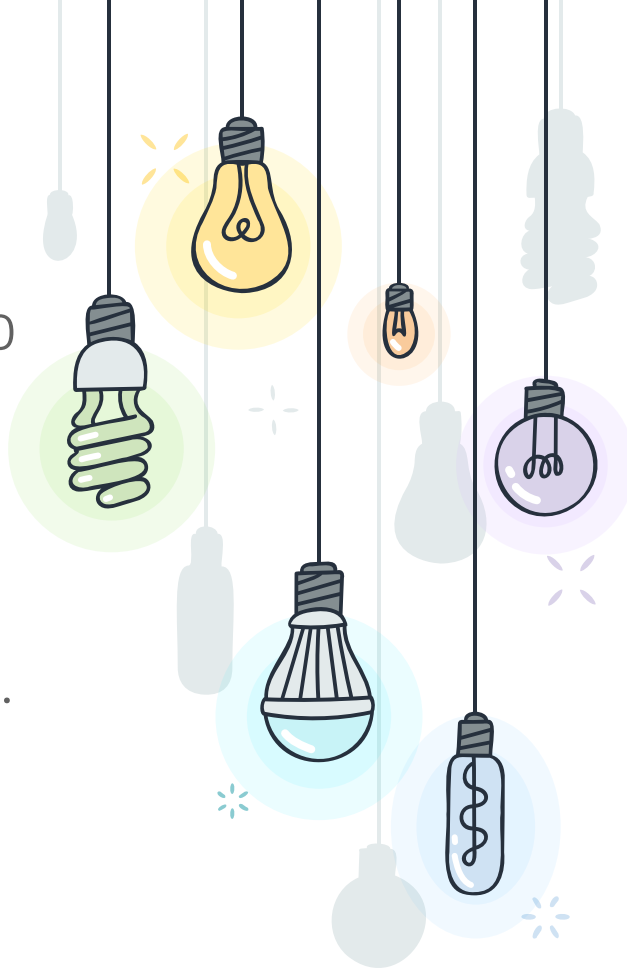
Style

- All the preliminary pages (title, abstract, preface..) should be named in small roman numerals. (i, ii, iv..).
- All the other pages should be named in Arabic numerals (1,2,3..) thus, your report begins with 1 – on the introduction page.



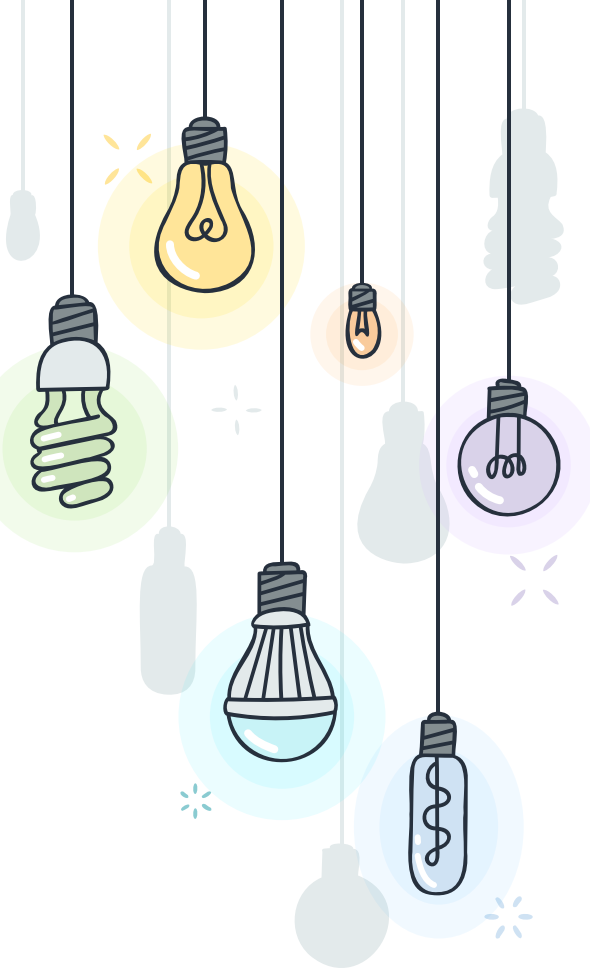
Style

- Separate long texts into small paragraphs to keep the reader engaged. A paragraph should not be more than 10 lines.
- Do not incorporate too many fonts. Use standard times new roman 12pt for the text. You can use bold for headlines.



Proofreading

- If you think your work ends when the report ends, think again. Proofreading the report is a very important step. While proofreading you see your work from a reader's point of view, and you can correct any small mistakes you might have done while typing. Check everything from content to layout, and style of writing.



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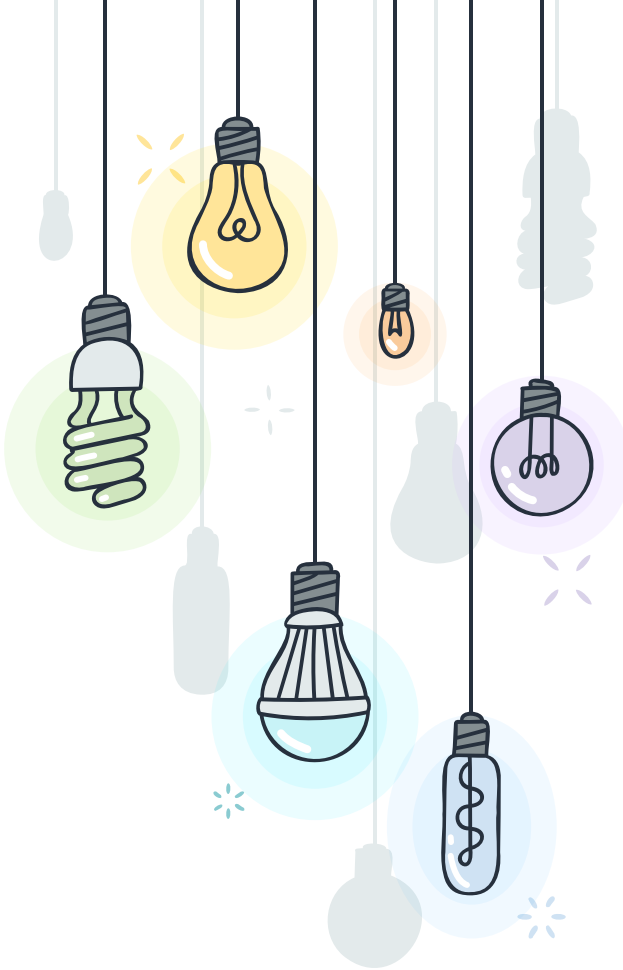
Part 5:

Technical Report Examples

Examples of Technical Reports

- Lab Reports
- Manuals
- Factual Data Statistics
- Forms and Surveys
- Job Application Materials



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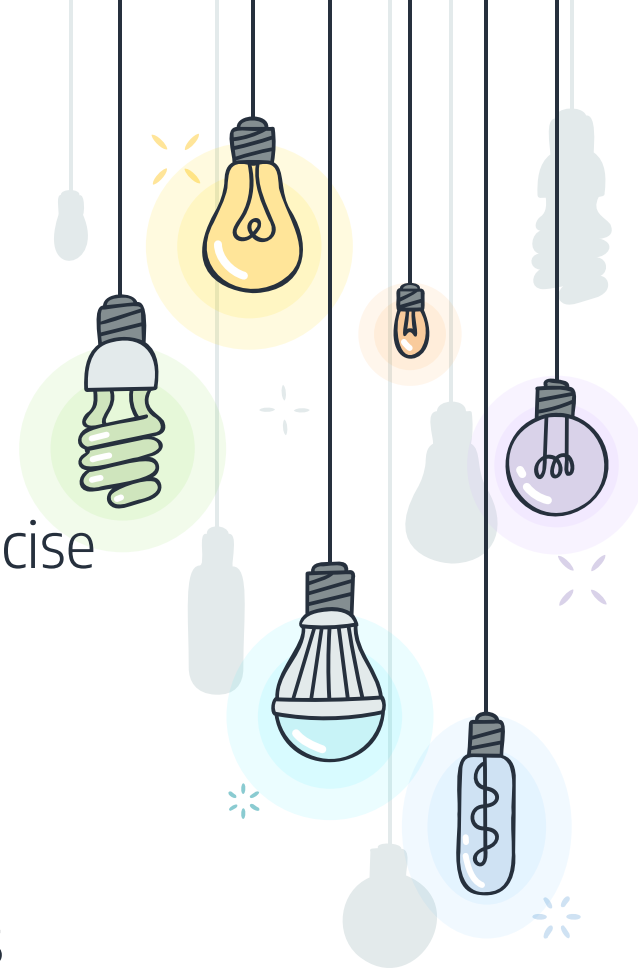
Part 6:

Reporting Descriptive Statistics

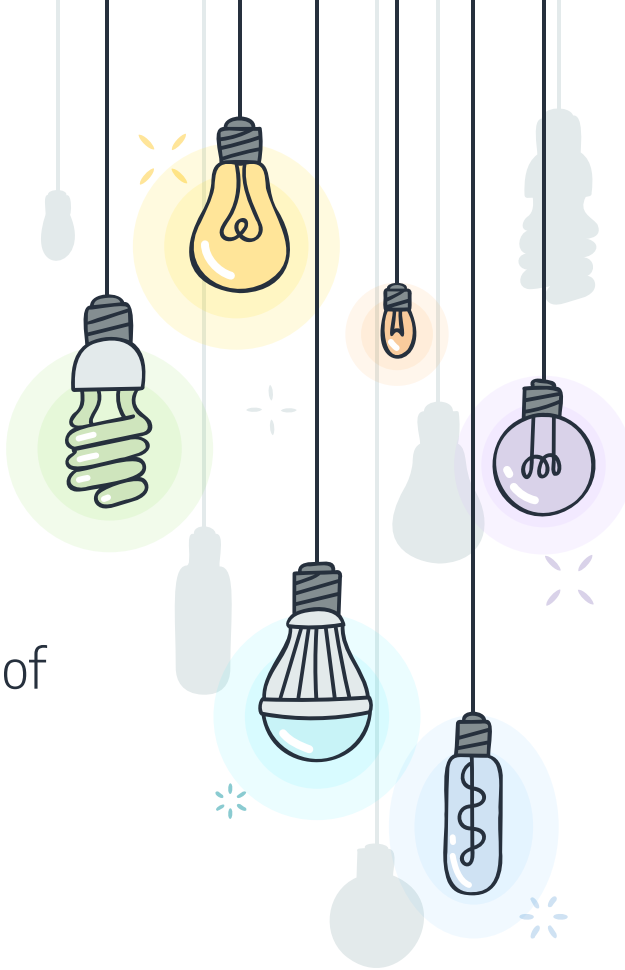
What are Descriptive Statistics for?

- Describe and summarize the key features or characteristics of a dataset
- Consolidate large amounts of data into a concise and easy-to-use form
- Understand the distribution of your data – whether it is normally distributed or not
- Conduct simple analysis and draw inferences



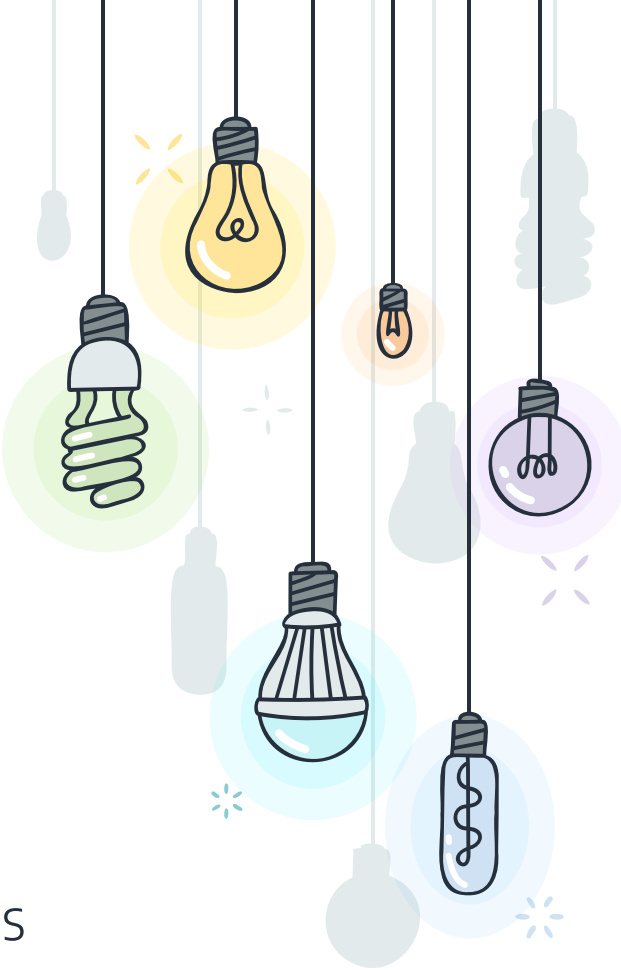
Types of Descriptive Statistics

- Measures of frequency: count, percentage, frequency
  - To show how often something happens or a response is given
- Measures of central tendency: mean, median, mode
  - To show what is most common or typical of a set of data
- Measures of variation: range, interquartile range, standard deviation
  - To show how spread out your data are



KEY CONSIDERATIONS WHEN CHOOSING OR REPORTING DESCRIPTIVE STATISTICS

1. Check the type of data you are summarizing
2. Present measures of central tendency along with measures of variation
3. Report standard deviation, not standard error of the mean
4. Give the baseline for any counts
5. Avoid using percentages when the denominator is very small



What to Report

1. Introduction to Your Data:
   - Begin by providing a brief description of your dataset, including its origin, collection methods, and what it represents.
   - "The dataset used in this study was obtained from [source]. It comprises of [number of observations], collected via [method of data collection], and represents [population of interest]."

What to Report

2. Variables and their Measures:
   - Clearly identify your study's variables and their measurement levels, providing definitions or explanations as needed.
   - "The study includes [number of variables] variables: [variable names]. [Variable name] is a [level of measurement] variable that represents [description]."

What to Report

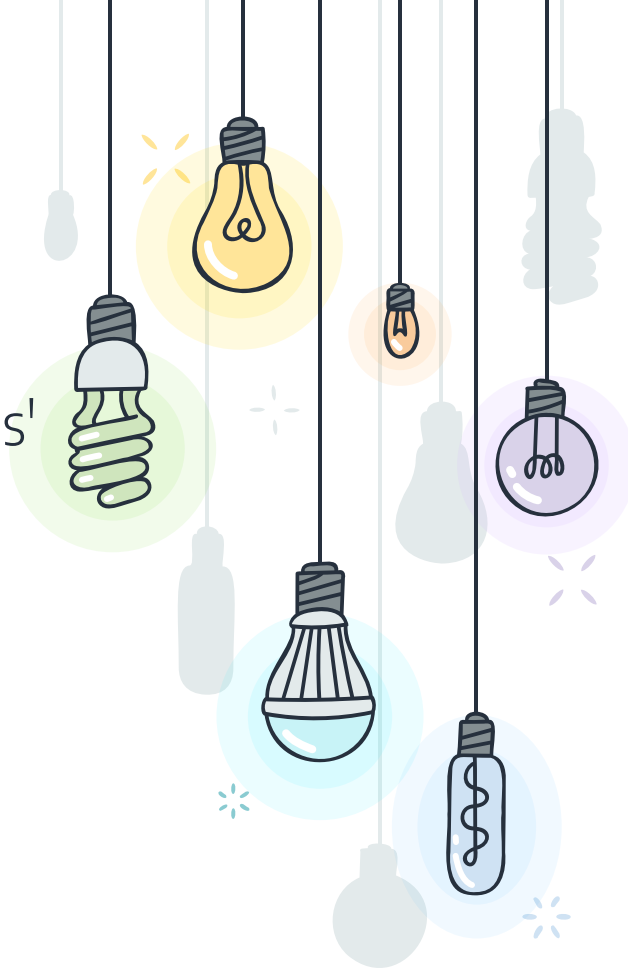
3. Measures of Central Tendency:
   - Depending on your data's distribution, report the mean, median, or mode.
   - "The [measure of central tendency] for [variable name] was [value]. "

What to Report

4. Measures of Dispersion:
   - Based on your data's level of measurement and distribution, report the range, interquartile range (IQR), variance, and/or standard deviation.
   - "[Variable name] ranged from [lowest value] to [highest value], with a standard deviation of [value]."

What to Report

5. Frequency Distributions:
   - For categorical variables, report the categories' frequencies or percentages.
   - "Of the participants, [percentage]% were [category]."

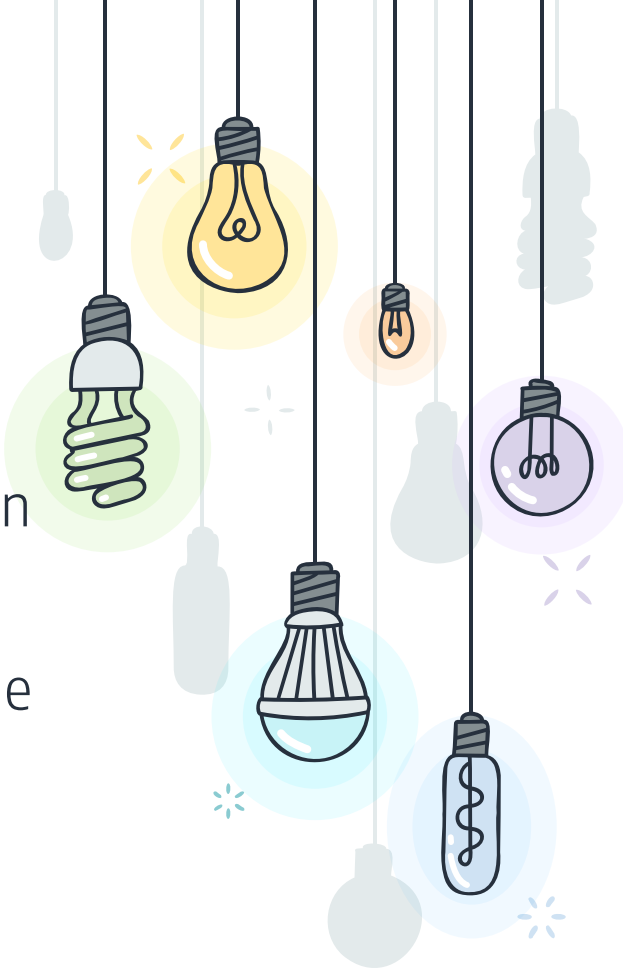


What to Report

6. Cross-tabulations and Comparisons:
   - Provide appropriate descriptive statistics when comparing groups or examining relationships between variables.
   - "[Group A] (M = [mean], SD = [standard deviation]) showed a different result compared to [Group B] (M = [mean], SD = [standard deviation])."

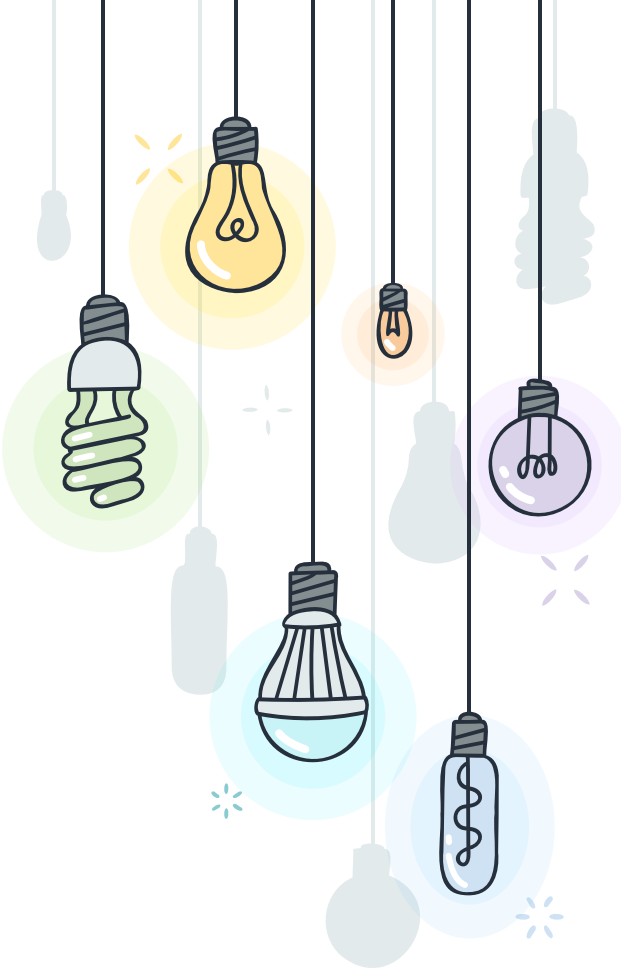
What to Report

7. Visual Representations:
   - Use graphs, histograms, box plots, etc., to visually represent your data, ensuring clarity in labels and legends.
   - "Figure 1 illustrates the distribution of [variable name]."



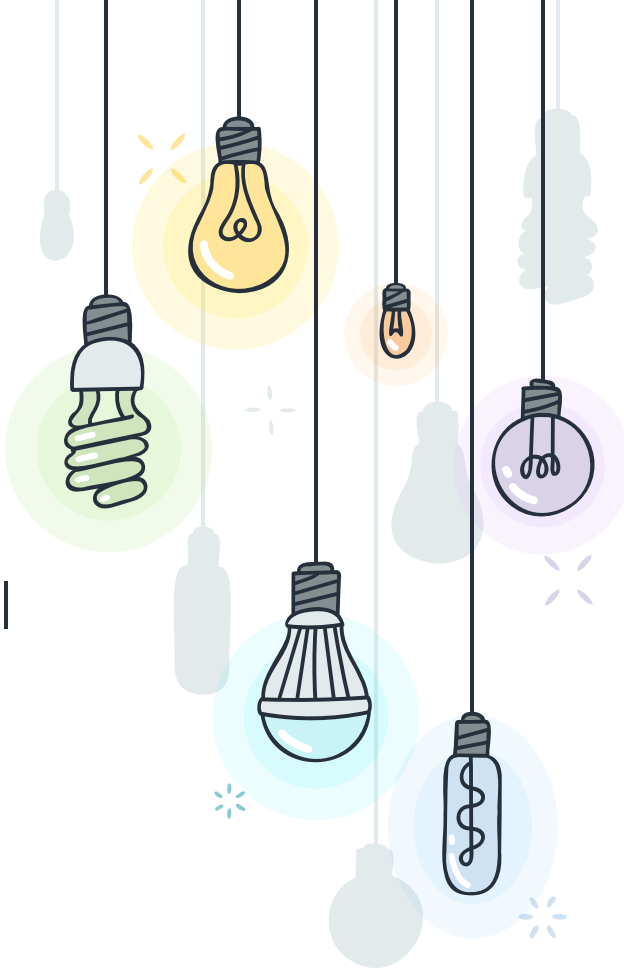
What to Report

8. Interpretation:
   - Offer a brief interpretation of the statistics in relation to your research question.
   - "The [statistical measure] suggests that [interpretation related to research question]."



What to Report

9. Assumptions Check:
   - Discuss if your data meet the assumptions required for any planned inferential statistics.
   - "The data met the assumptions for [statistical test], as [justification/explanation]."



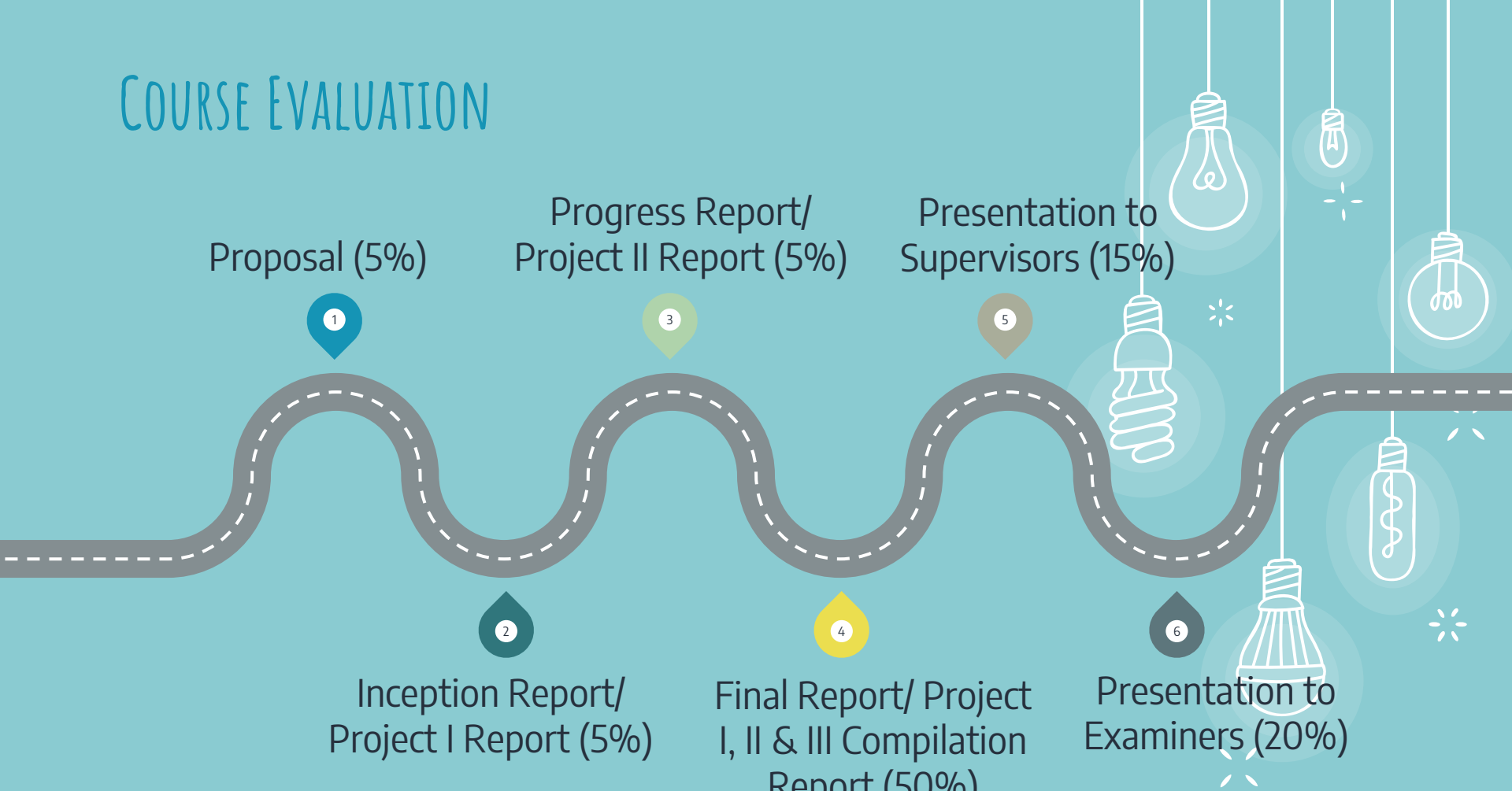
CAPSTONE PROJECT

NORATIQAH MOHD ARIFF

SYNOPSIS

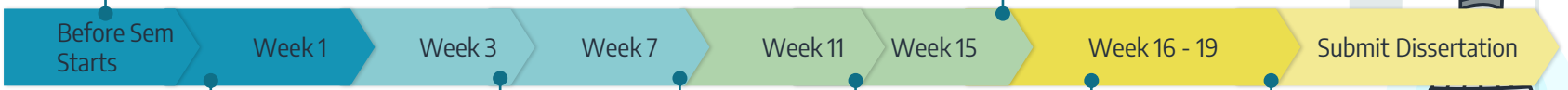
This course prepares a platform for students to gain experience by producing a project which will be assessed by potential employers. Students will have to find an attachment with an industry that deals with data science and analytics. The projects assigned by the industry shall involve the use of pertinent knowledge and computing skills (R/Python/etc.) that have been acquired by the students. Throughout the course of the projects, students will identify problems, suggest solutions, perform analysis and report findings in the form of report writing and presentations. Each student will be jointly supervised by the industry and UKM.

Course Evaluation



Timeline

1. Identify Placement
2. Request a formal letter from the Secretariat for Postgraduate Studies
3. Send the letter to the place of placements
4. Confirm placements
5. Inform the Programme Coordinator about the placement by filling up Google Form (link will be given)
6. In the same Google Form, provide 3 potential UKM supervisors. You will be notified of your UKM supervisor before the start of the term.



Capstone Project Starts

Proposal Submission – UKM Supervisor (5%)

1st Report Submission – UKM Supervisor (5%)

2nd Report Submission – UKM Supervisor (5%)

Final Report Submission (20% UKM Supervisor, 15% Industrial Supervisor, 15% Examiner) – Programme Coordinator (3 copies) & Industrial Supervisor (1 copy)

Presentation to Supervisors (5% UKM Supervisor, 10% Industrial Supervisor)

Presentation to Examiners (20%)

Thank You