

Technical Writing Skills

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Disclaimer: This presentation is to guide you for a good report writing – there may different opinion on best practices for report writing – Report writing is subjective and best practices varies from publisher to publishers; The presentation is for education purpose any omission of source is mare coincidence or out of knowledge of the author.











Organization: Title Page

University of Reading

Department of Computer Science

Computer Science Undergraduate Report Template and Report Writing Guide

FirstName(s) LastName

Supervisor: Supervisor's Name

A report submitted in partial fulfilment of the requirements of the University of Reading for the degree of Bachelor of Science in *Computer Science*



Abstract

250-300 Words Max

Summary of you research / Individual project:

- √ Key research question(s) / problem statement
- ✓ Overall project aims and objectives
- ✓ Key methodology / technique / data acquisition / adopted for analysis
- ✓ Key findings / results
- ✓ Your interpretation / critical assessment / conclusions



Acknowledgements

- Acknowledge the support you receive:
- Examples:
 - ✓ Your supervisor(s)
 - ✓ If you receive technical / data support from a company
 - ✓ Any researcher / person that may have offer support in any form in your project (e.g., help with codes, proofreading you report etc.)

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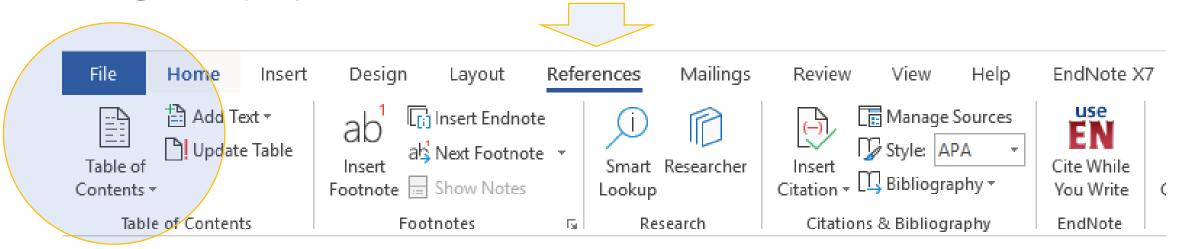


List of figures iii Usually Roman numbers List of Tables ίV Nomenclature 1 Introduction 1.1 Motivation 1.2 ... 2 Literature Review 10 2.2 ... 11 Usually Indian numbers 6 Conclusions 30 31 7 Reflection Reference 32

34



MS Word



Latex

```
\documentclass{report}
   :
\begin{document}

\tableofcontents
:
\end{document}
```



Introduction

- ✓ Background
- ✓ Problem statement
- √ Research question(s) / Hypothesis
- ✓ Aims and Objectives
- ✓ Solution Approach
- ✓ Summary of contribution and achievements



Literature Review

- ✓ Project work set in the context of existing literature / products / systems
- ✓ Discus (analyse) whether the intended application/ system/ product is contextual / relevant to the present world.
- ✓ Critique of existing work against the own intended development.





Methodology

- ✓ Adapt existing algorithms / program / technology / methods
- ✓ Use of appropriate design methods to represent conceptual architecture of the intended work
- ✓In-depth justification of the design decision.



Flowcharts

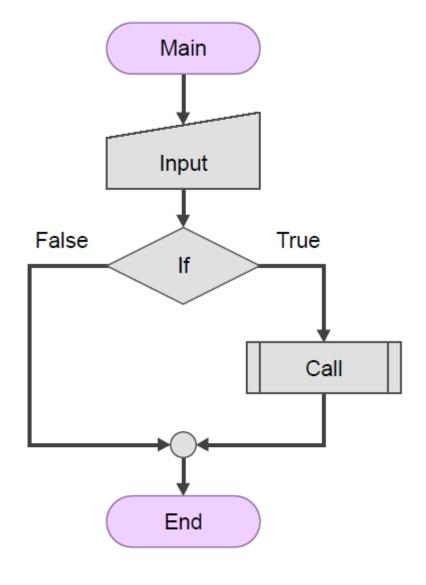






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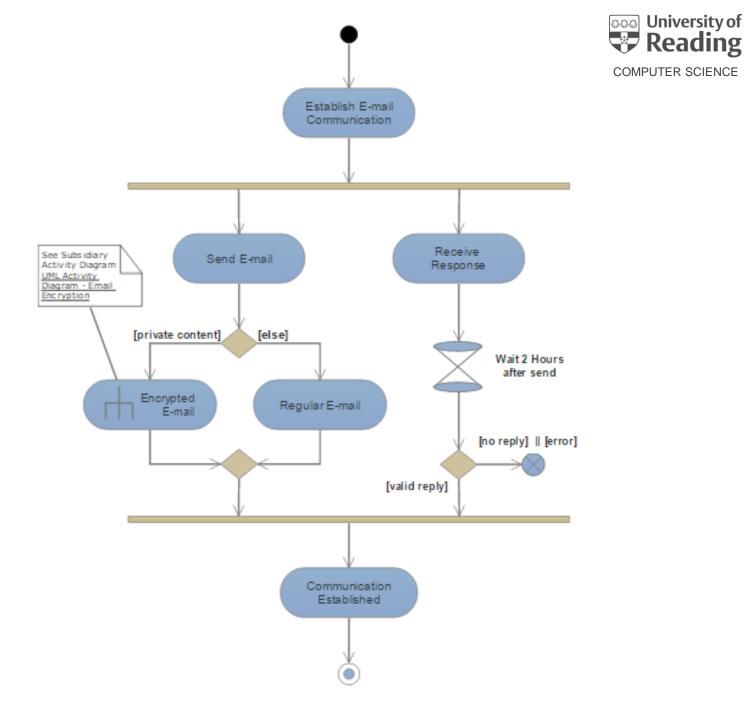
Methodology

UML Diagram











Use of Data/Database

- ✓ Description of dataset sources for the indented work
- ✓ Use of proper techniques data cleansing and pre-processing
- ✓ Description of statistical/ computational analysis on the collected data.





Implementation of algorithm / program / system

- ✓ Use of the implementation tools / Application Programming Interface (API)/ language.
- ✓ Demonstration of technical specification of the implantation in the form executable algorithm / program
- ✓Outcome / Results for algorithm/ program / system meeting the indented aims and objectives of the project



Testing and Validation

- ✓ Description of test cases
- ✓ Use of testing methods such as: unit (individual executable component) test, integration test,
 acceptance (user perspective) test
- ✓ Algorithm/ program / system tested and verified against intended aims and objectives of the project





Self-reflection

- ✓ Evidence of the developed algorithm's usability and extensibility
- ✓ Critical reflection of own work in terms of:
 - the algorithm/ program / system achievements,
 - limitation, and
 - challenges







Verb in scientific report: Abstract

Abstract is the representational summary of each chapter

Therefore verb in abstract follows section's verb



Verb in scientific report: Introduction

- When stating a fact that is widely accepted, the present tense is appropriate.
 - DNA is composed of four nucleotides
- When referring to a previous study with results that are still relevant, use the present perfect tense
 - Johnson et al. have shown that gene X is part of an operon
- When referring specifically to the methods used in a previous paper, the past tense is the best.
 - gene X was first cloned into a shuttle vector in 2003
- Present tense is used when a specific result, figure, or paper is the subject of a sentence
 - the results of their study indicate that the drug is highly effective
- Statements that are no longer considered true should remain in the past tense
 - early physicists thought that electrons travelled in defined orbits



Verb in scientific report: Method

- The methods chapter should use the past tense because it is a report of what was done during the course of the study.
 - cells were transfected, irradiated, and assayed for DNA damage
 - we adopted machine learning technique for gene classification



Verb in scientific report: Results

 the results chapter of a report is also largely written using the past tense since this chapter reports about what you have already achieved

- all participants reported a significant reduction in pain
- sum of squared error was low for gene classification



Maths in Report

Euler's formula states that for any real number x:

$$e^{ix} = \cos x + i \sin x, \tag{1}$$

where e is the base of the natural logarithm, i is the imaginary unit, and \cos and \sin are the trigonometric functions cosine and sine respectively, with the argument x given in radians

Euler's formula in Eq. (1) evaluates to $e^{ix} + 1 = 0$, which is known as Euler's identity



Maths in Report

defining variable

Euler's formula states that for any real number x:

Colon preceding equation

equation number

immediate definition of variables

$$e^{ix} = \cos x + i \sin x$$
, punctuation for equation

where e is the base of the natural logarithm, i is the imaginary unit, and cos and sin are the trigonometric functions cosine and sine respectively, with the argument x given in radians

Euler's formula in Eq. (1) evaluates to $e^{ix} + 1 = 0$, which is known as Euler's identity in-text citation of equation



Maths in Report

defining variable

COMPU

Euler's formula states that for any real number x:

Colon preceding equation 3

equation number

immediate definition of variables

$$e^{ix} = \cos x + i \sin x$$
, punctuation for equation (2)

where *e* is the base of the natural logarithm, *i* is the imaginary unit, and *cos* and *sin* are the trigonometric functions cosine and sine respectively, with the argument *x* given in radians

Euler's formula in Eq. (1) evaluates to $e^{ix} + 1 = 0$, which is known as Euler's identity

in-text citation of equation



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Table 1: Datasets for classification problem

#	Inputs (Class (Y)	
	Length (cm)	Weight (kg)	Animal
Ex. 0	23.2	3.2	Cat
Ex. 1	70.9	19.5	Dog
Ex. 2	60.5	18.51	Dog
Ex. 3	24.5	4.6	Cat
Ex. 4	110.0	35.83	Dog
Ex. 5	23.8	3.7	Cat



In Table 1, we describe the dataset collected for classification problem. Table 1 shows two class cat and dog



Some text some t

1

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Table caption goes on top of table (Font is smaller than the body text)

2

In -text citation answer have Capital later 'T' in word Table follows by number of table, it takes present tense

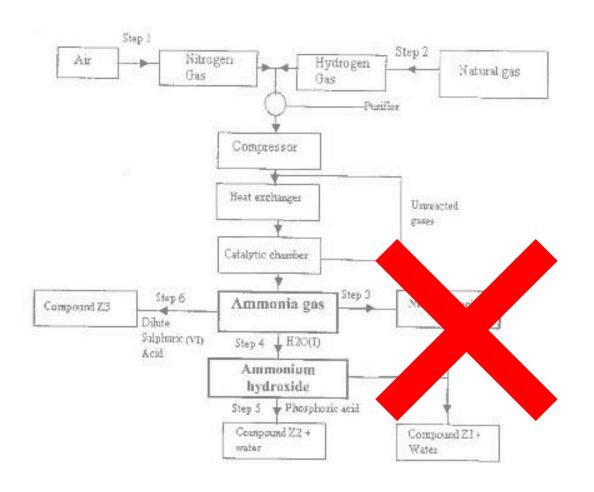
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Figure

Α	В	С	D	Е
K	32	58		
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M		dg		
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Table is **NOT** a Figure





Figure

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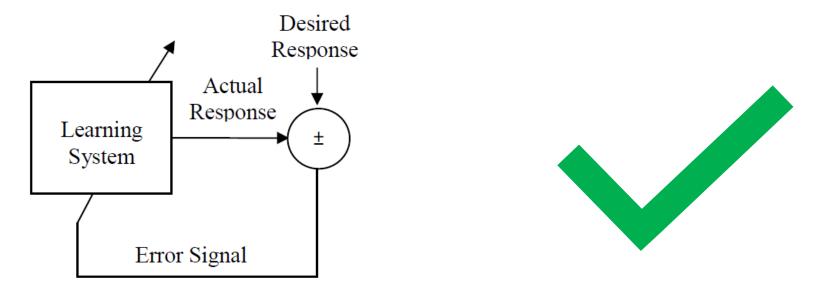


Figure 1: Supervised learning system; Symbol ∓ indicates error correction

In Figure 1, we describe the error correction system in a supervised learning system. Figure 1 indicates that a loop required for error correction while consulting actual response with desired response



Figure

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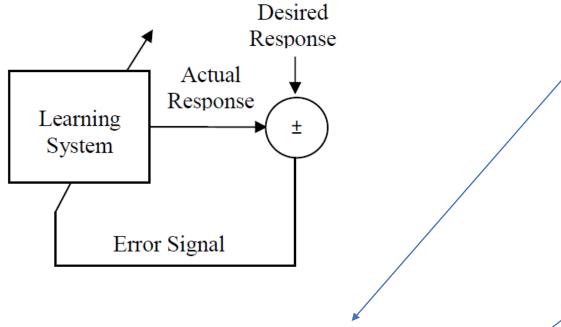


Figure 1: Supervised learning system; Symbol ∓ indicates error correction

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Figure caption goes

In-text citation have Uppercase word "Figure" follows by number of figure, it takes present tense

In Figure 1, we describe the error correction system in a supervised learning system. Figure 1 indicates that a loop required for error correction while consulting actual response with desired response



Reference

- Reference is a list of information source such as books, journal article, conference paper, web portal URL, etc that have been cited in report.
- All information gathered from literature must be cited within the text of the report were it belong to, else report may be considered plagiarized.
- List of information source be arranged in uniform style



Reference

- ✓ Reference style can be
- ✓APA (American Psychological Association) Style
- ✓ Harvard Style
- ✓ Simple numbering system



APA Style

Web page with author:

In-text citation

Role-play can help children learn techniques for coping with bullying (Kraiser, 2011).

Reference entry

Kraizer, S. (2011). Preventing bullying. Retrieved from http://safechild.org/categoryparents/preventing-bullying/

Web page with no author:

In-text citation

The term Nittany Lion was coined by Penn State football player Joe Mason in 1904 ("All things Nittany," 2006).

Reference entry

All things Nittany. (2006). Retrieved from http://www.psu.edu/ur/about/nittanymascot.html



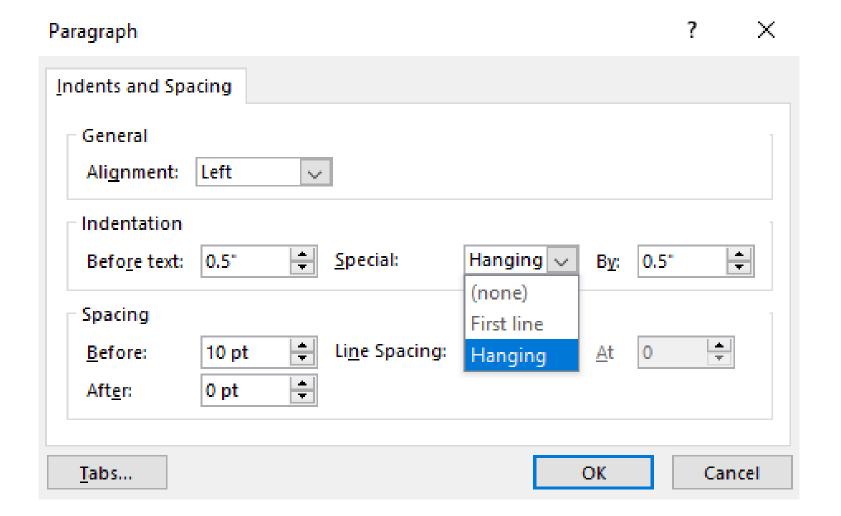
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APA Style





Questions?