

LaTeX Elective Module

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1 Learning Objectives

1. Typeset a document using the latex typesetting system and compile it into a pdf.
2. Typeset simple mathematical equations in a LaTeX document.
3. Include highlighted code in a LaTeX document.
4. Use the automatic referencing and citation mechanisms in LaTeX.

2 Introduction

This is a sample of the of the LaTeX elective module for SIT192. LaTeX is a document type sitting application which is used to format formal, technical, programming, and equations in a formal and effective way. We will look at some key things to know that you can do in LaTeX, you can find these in each section and subsection. I highly recommend having a look at the .tex document alongside the PDF submission as I have provided some comments of everything we are creating and why we are doing it.

3 Numbered Mathematical Equations

$$E = mc^2 \tag{1}$$

This is Einstein's famous equation (Equation 1), where E relates to energy, m relates to mass, and c the speed of light. [1] **Another example:**

$$F = ma \tag{2}$$

This is Newton's second law of motion (Equation 2), where F is force, m is mass, and a is acceleration.

4 Citations

Here we can use the reference we created to our citation. This would look like [1]
The [1] means that this reference was number 1.

5 Code Example

Here we will create a C++ program which declares an array of size n and iterates adding elements.

```
#include <iostream>

int main()
{
    int array[5];

    for(int i = 0; i < 5; i++)
    {
        array[i] = i*2;
    }
    return 0;
}
```

[2]

6 Algorithm Description

Let's describe a simple algorithm for calculating the factorial of a number:

- Input: A positive integer n .
- Output: The factorial of n , denoted $n!$.
- Algorithm:
 1. Start with a variable 'result = 1'.
 2. For each number from 1 to n , multiply 'result' by the current number.
 3. Return the value of 'result'.

7 Conclusion

Here I have showed how to use the core features of LaTeX. I think that I am successful as I have created a document including a title, name and student number, mathematical equations, references, code snippet, and technical information required by the self assessment. I know that I am successful as I have included met learning objectives 1,2,3, and 4.

Other

References

- [1] Albert Einstein, *On the Electrodynamics of Moving Bodies*, Annalen der Physik, 1905.
- [2] Isak Oswald, *C++ code*, Isak Oswald, 2025.