Instructions

Use LATEX to typeset a mathematical document which:

- Explores a topic. We will release some topic idea options for the project which students can use (first come, first serve for signup) however coming up with your own topic ideas is encouraged. Groups that come up with their own ideas will have to get the topic approved. subject to the instructional team's approval;
- Develops all the definitions and preliminary results necessary to state and prove the main result;
- Applies the main result to an interesting or important problem, or generalises or extends the main result in a new direction; and

Submit the .tex and .pdf file of your project to the appropriate section of Canvas in advance of the project deadline.

Rubric

Your project will be graded out of a total of 100 points, according to the following criteria, whose weightings are indicated:

- **Project Outline** (20 points): To receive full credit, your project outline should include your main idea, how you will communicate your main idea, and how you will take this idea further with generalizations. You should use the project outline template.
- **Project Draft** (20 points): At this stage, you should expand on the results developed and move your results from the projet outline template to the final-paper-template.
- **Final Paper** (20 points):
  - **Comprehensibility and examples**. Your document should be self-contained, but may assume knowledge of the topics we have covered in this course. Any other definitions and preliminary results needed to understand the statement and proof of your main result, and material in subsequent sections, should be developed in your project.

    Your document should be comprehensible to another student in the course, and should contain examples illustrating the concepts and results covered.
  - **Mathematical correctness** . The definitions, result statements and proofs in your document should all be mathematically correct, and should be written in enough detail that another student in the course can understand them.
  - **Accuracy of mathematical writing** . Your use of mathematical notation and terminology should be accurate, and your variables should be correctly quantified.

    Formatting. Your document should be laid out neatly and should look professional. It should be typeset in LaTeX, and should use the templates we have provided (or something similar). A more specific breakdown of this criterion is as follows.

    * **Accuracy and appearance**: the extent to which the typeset document is neat, professional and readable.
    * **Document structure**: use of sections and subsections, paragraphs, and both bulleted and enumerated lists.
    * **Text formatting**: use of emphasis (e.g. bold face, italic or underlined text), text alignment and different fonts.

* **Mathematical notation**: use of math mode to typeset mathematical notation, appropriate use of variables and symbols, in-line and displayed equations, and aligned equations.
* **Results, definitions and references**: appropriate use of definition, theorem and proof environments, and use of labels and references.

Guidelines

- Needs to be in LaTeX
- Needs to have a main result(s)
- Needs to be ongoing problem (papers still being published)
- Needs to have a coding component if applicable (*CS* 2051, not *MATH* 2051)
- Needs to be explainable (you need to be able to present your findings in-person at the poster walk)

Final Presentation (40 points): The final presentation will be a science fair-style affair, with groups setting up posters or presentations in a room with the intention of presenting their findings and ideas to their peers and instructors. Nithya will be in charge of this.