MATH 210 Assignment 1

Jupyter Notebooks, Markdown Language and LaTeX

INSTRUCTIONS

- Create a new Python 3 Jupyter notebook
- Answer each question in the Jupyter notebook and clearly label the solutions with headings
- There are 18 total points and each question is worth 3 points
- Submit the `.ipynb` file to Connect by **11pm Friday January 13, 2017**

QUESTIONS

1. Write a description of your favourite city. Your description should include an image of the city (with a link below the image leading to the source of the image), a paragraph explaining why this city is your favourite (the text should include some italic and bold formatting) and links to the various places, attractions, events, people, etc. which make the city unique.

2. Create a nested list of your favourite courses you have taken at UBC (or other universities) and include a link to the course page on the UBC Student Services Centre Course Schedule

   `courses.students.ubc.ca/cs`

   For example, my favourite course taught at UBC are:

   - First Year
     - MATH 100 Differential Calculus with Applications to Physical Sciences and Engineering
     - MATH 104 Differential Calculus with Applications to Commerce and Social Sciences
     - MATH 152 Linear Systems
   - Second Year
     - MATH 210 Introduction to Mathematical Computing
     - MATH 255 Ordinary Differential Equations

3. Write LaTeX code to display the system of linear equations:

$$\begin{bmatrix} 5 & 2 & 1 \\ 3 & 7 & 5 \\ 2 & 0 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 0 \\ 1 \\ 3 \end{bmatrix}$$

4. Write LaTeX code to display the Maxwell-Faraday equation:

$$\oint_{\partial\Sigma} \mathbf{E} \cdot d\boldsymbol{\ell} = -\frac{d}{dt} \iint_{\Sigma} \mathbf{B} \cdot d\mathbf{S}$$

(Hints: `\mathbf`, `\ell` and `\boldsymbol`)

5. Write LaTeX code to display the Black-Scholes equation:

$$\frac{\partial V}{\partial t} + \frac{1}{2}\sigma^2 S^2 \frac{\partial^2 V}{\partial S^2} + rS\frac{\partial V}{\partial S} - rV = 0$$

6. Choose a definition, equation or theorem from any of your math courses (past or present) which you find interesting. Write LaTeX code to display the definition, equation or theorem, write a short description of it and explain why you find it interesting. (The definition, equation or theorem should include several nontrivial mathematical symbols.)