MATH 131: Numerical Methods for scientists and engineers – Discussion 2: Coding

The goals of this discussion section are to get a deeper understanding of how to debug your Matlab codes. **Assessment will be via Matlab Grader and will remain open for until Friday**.

1. Consider the `MATLAB` script, called `function_plotter` that is provided on Catcourses. This code has numerous errors and cannot run. The goal of the script `function_plotter` is to plot two functions in Matlab, $f1(x) = x^2 - 2x + 1$ and $f2(x) = e^x - x^3$ over the interval from -1 to 1 with increments of 0.01. The plot should plot $f1(x)$ in red and $f2(x)$ in blue and feature a legend and a title.

2. Consider the `MATLAB` function, called `my_summy` that is provided on Catcourses. This code is error-free but provides the incorrect answer. The function `my_summy` takes in as input n and calculates and returns as output the variable `total_sum`, which represents the sum $\sum_{k=1}^{n} \left(\frac{1}{k^2} + 2k\right)$. Come up with your own test cases (what if n=1, n=2) by hand and compare to the output. You can remove semicolons to show the output as you are going through the loop. Fix the code so that it provides the correct answer.