Computer Assignment 1

1. A beautiful identity in Mathematics known as Euler's identy is given as

$$e^{i\pi} + 1 = 0 \tag{1}$$

where e is Euler's constant and i is unit imaginary number. Calculate the value of $e^{i\pi} + 1$ and show that it is zero. Make sure you use format bank for the output display format.

2. The trigonometric sine function is sometimes represented by the infinite series:

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots, x \in \mathbb{R} \tag{2}$$

For $x = \frac{\pi}{6}$, find an approximation to $\sin x$ using the first three terms of this series. Compare your approximation with the actual value of $\sin x$.

3. A logical expression which is always true is called a 'tautology'. Using MATLAB, show that the logical expression P OR ((NOT P) OR Q) is a tautology.

4. Enter the expression $-1 < 0 < 0.5$ in the command window and press Enter. What do you get? Justify your answer.

5. The floor function floor(x) in MATLAB calculates the greatest integer less than or equal to a number x. Use floor function to find the number of multiples of 3 which are less than 50.