1. Set up a $4 \times 4$ matrix, and use the function \texttt{sum} to find the sums of the first row and second column of the matrix.

2. Solve the following system of equations using Matlab:

\begin{align*}
2x + y + 5z &= 5 \\
2x + 2y + 3z &= 7 \\
x + 3y + 3z &= 6.
\end{align*}

Verify your solution by matrix multiplication.

3. Write a simple script to input two square matrices $A$ and $B$. Then add, subtract and multiply them. Comment the script and use \texttt{disp} to output suitable titles.

4. Write a Matlab script to produce graphs of the functions $y = \cos x$ and $y = \cos(x^3)$ in the range $x = -4 : 0.02 : 4$ using the same axes. Use the Matlab functions \texttt{xlabel}, \texttt{ylabel} and \texttt{title} to annotate your graphs clearly.

5. Write a function \texttt{col\_sum} that generates a random square matrix $A$ of specified size $n$, and then finds the sums of each of the columns using

(a) \texttt{for-loops},
(b) the function \texttt{sum}.

Include a timing comparison. Test the function with $n = 10, 100, 1000$. 