Introduction to MATLAB Notes

- ascii
  ```
  >> double('b')
     ans =
           98
  ```
  ```
  >> char ('dcx' + 1)
     ans =
         edy
  ```
  why?
  $[d \ c \ x] \rightarrow [e \ d \ y]$
  100 99 120   101 100 121

- Other tricks
  ```
  >> rand < 2
     ans =
         1
  ```
  True because rand ranges from 0 to 1

  ```
  >> rem(7, 2)
     ans =
         1
  ```
  See modulo, mod() also. $7 \div 2 = 3 + (rem = 1)$

  ```
  >> ceil(-4.5)
     ans =
         -4
  ```
  ceil() will round up to nearest integer

  ```
  >> linspace(5, 15, 3)
     ans =
         5    10    15
  ```
  5 · · · · 10 · · · · 15

- Vector and matrix operations
  Given the following:

  $$A = \begin{bmatrix} 3 & -1 & 2 \\ 0 & 2 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix} \quad C = \begin{bmatrix} 3 & 4 \\ 2 & 1 \end{bmatrix} \quad D = \begin{bmatrix} 3 & 1 \end{bmatrix}$$

  A - C ... not possible because the dimensions do not agree

  B.*C ... 3   8
           -2   0
  $$\begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix}\begin{bmatrix} 3 & 4 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} 1 \cdot 3 & 2 \cdot 4 \\ -1 \cdot 2 & 0 \cdot 1 \end{bmatrix}$$

  A * B ... not possible because the inner dimensions do not
          match (A is 2×3 while B is 2×2)
          $3 \neq 2$

  B * A ...   3   3   4
             -3   1 -2
  $$\begin{bmatrix} 1 & 2 \\ -1 & 0 \end{bmatrix}\begin{bmatrix} 3 & -1 & 2 \\ 0 & 2 & 1 \end{bmatrix} \Rightarrow$$
  $1 \cdot 3 + 2 \cdot 0 = 3 \quad -1 \cdot 3 + 0 \cdot 0 = -3$
  $1 \cdot -1 + 2 \cdot 2 = 3 \quad -1 \cdot -1 + 0 \cdot 2 = 1$
  $1 \cdot 2 + 2 \cdot 1 = 4 \quad -1 \cdot 2 + 0 \cdot 1 = -2$

  D * C ...   11   13
  $$\begin{bmatrix} 3 & 1 \end{bmatrix}\begin{bmatrix} 3 & 4 \\ 2 & 1 \end{bmatrix} \Rightarrow$$
  $3 \cdot 3 + 1 \cdot 2 = 11$
  $3 \cdot 4 + 1 \cdot 1 = 13$