Intro to AI - HW0

1. Create the following vector variables.
   a. $v = \begin{bmatrix} 3 & 0 & 2.1 & 4 & 0.2 \end{bmatrix}$
   b. $u = \begin{bmatrix} e^{-1} \\ e^{0} \\ e^{1} \\ e^{2} \\ e^{3} \end{bmatrix}$
   c. Row vector w which contains the integers from -4 to 0
   d. Row vector m which contains the even integers from 0 to 10
   e. Column vector s which contains evenly spaced entries from 2 to 0 by -0.1
   f. Column vector t which has 100 evenly spaced entries from 0 to 2π
2. Create the following matrix variables.
   a. $A = \begin{bmatrix} 1 & -2 & 0 \\ -2 & 1 & -2 \\ 0 & -2 & 1 \end{bmatrix}$
   b. 9×9 matrix of all zeros.
   c. 9×9 matrix B of all 3s
   d. 9×9 matrix C where $C_{ii} = 0$ for $i = 1, \ldots, 9$ and $C_{ij} = 9$ for $i \neq j$
   e. 9×9 diagonal matrix D with diagonal $d = \begin{bmatrix} 1 & \cdots & 4 & 5 & 4 & \cdots & 1 \end{bmatrix}$
   f. 9×5 matrix F where each column of F is $\begin{bmatrix} 1 & \cdots & 9 \end{bmatrix}^T$
3. Perform the following operations using the variables created from the problems 1 & 2.
   a. $e^{\sqrt{v}}$
   b. $\log(u)$
   c. $|w| + 4$
   d. $\sin(t)$
   e. Reverse the order of the rows of A.
   f. Change the second row of B to 1s.
   g. Remove the first row of D.
   h. Greate a matrix C_2 that is the upper left 2×2 submatrix of C.
   i. Replace the first column of F with the same column but in reversed order, i.e. $[9 \cdots 1]^T$.