The objective of this homework is to test your understanding of the content of Module 3 and Module 4. Due date of the homework is: **Friday, September 18th, 2020.** You have to upload a scanned version of your solutions on Blackboard. If you don't have a scanner around you, you can use Cam Scanner—a mobile app that scans images in a neat way, as if they're scanned through a copier.

For questions related to the homework, please email the two teaching assistants: (a) Wasim (email: wasim.dipon@my.utsa.edu) and (b) Yuvaraj (email: yuvaraj.munian@utsa.edu).

You can send your question to both of them on the same email. Feel free to CC me as well, but that is not necessary.

1. You have the following row vector, a = [1 3 6 8 9]. Create the following matrix in a loop. [*Hint:* Notice that from the second row onwards, value of the elements keeps incrementing by 1] **(25 points)**

$$a = \begin{bmatrix} 1 & 3 & 6 & 8 & 9 \\ 2 & 4 & 7 & 9 & 10 \\ 3 & 5 & 8 & 10 & 11 \\ 4 & 6 & 9 & 11 & 12 \\ 5 & 7 & 10 & 12 & 13 \end{bmatrix}$$

2. Enter the matrices $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \end{bmatrix}$ and $\mathrm{B} = \begin{bmatrix} 1 & -1 \\ 3 & 0 \\ 5 & -2 \\ 7 & 0 \end{bmatrix}$ into MATLAB.

   Use MATLAB to evaluate the **AB** product. Record the new matrix.

   Attempt to use MATLAB to evaluate the **BA** product. Explain in terms of matrix dimensions why you get an error message. **(15 points)**

3. The following program shows MATLAB codes where a user enters a number for a month and the program displays is it an ***odd month*** or an ***even month*** depending on the number entered. If none the conditions are true, the program displays a message asking the user to ***try again***.

   Read the following MATLAB code carefully, understand the logics involved and write the same logics using ***Switch Case function*** instead of ***if else functions*** as shown in the codes.

[*Hint:* There are three cases and you have to put each case as to be same as the corresponding if or elseif statements.] **(25 points)**

```
n=input ('Enter a month (1-12):');
if n==1||n==3||n==5||n==7||n==9||n==11
    disp ('odd month')
elseif n==2||n==4||n==6||n==8||n==10||n==12
       disp ('even month')
else
       disp ('TRY AGAIN')
end
```

4. Use MATLAB to determine the determinant of the following matrix. Do you think inverse of this matrix is possible? If not, explain why with the help of the equation, $A^{-1} = \frac{1}{\det(A)} adjA$

[*Hint:* Try finding the determinant of the matrix using *det* function, then use round function to get the value. So, determinant of A= round(det(A))] **(15 points)**

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 5 & 7 & 9 \end{bmatrix}$$