Table of Contents

```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
%This program creates and concatenates vectors in various ways to
 eventually
%create matrix H with the last row and the last column being the sum
 of the
%other elements in their respective rows and columns.
%
% Assigment Information
%    Assignment:   PS 03, Problem 1
%    Author:    Cole Jennewein, cjennewe@purdue.edu
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%    Paired Partner:  Will Popovich, wpopovic@purdue.edu
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%    Contributor:  Ethan Hotson, ehotson@purdue.edu
%    Our contributor(s) helped us:
%      [ ] understand the assignment expectations without
%          telling us how they will approach it.
%      [ ] understand different ways to think about a solution
%          without helping us plan our solution.
%      [ ] think through the meaning of a specific error or
%          bug present in our code without looking at our code.
%
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

```
%This block creates the initial matrices used in this program
A = zeros(4); %create matrix A as a 4x4 zero matrix
vals = [1 3 2 4;5 6 7 8;9 10 11 12;13 15 14 16]; %creates matrix vals
```

COPY & CONCATENATION

```
%This block creates the matrices that will be used to create matrix A
M = vals(2:3 , 2:3); %takes the middle 2x2 of vals
C = vals(1, 2:3); %takes specific values from vals and makes a 1x2
 matrix
D = vals(4 , 2:3); %takes specific values from vals and makes a 1x2
 matrix
E = [vals(1) D vals(1,4)]; %concatenates D between the first and 4th
 elements in the first row of vals
F = [vals(4) C vals(4,4)];%concatenates C between the first and 4th
 elements in the last row of vals
```

REPLACE MATRIX ELEMENTS

```
%This block primarily manipulates matrix A
A(1,:) = E; %Replaces first row of A with E
A(4,:) = F; %Replaces last row of A with F
A(2:3 , 2:3) = M; %Replaces the center 2x2 of A with M
A(2) = vals(3,4); %Replaces the value at 2,1 of A with the value at
 3,4 in vals
A(3) = vals(2,4); % Replaces the value at 3,1 of A with the value at
 2,4 in vals
A(2,4) = vals(3,1); %Replaces the value at 2,4 in A with the value at
 3,1 in vals
A(3,4) = vals(2); %Replaces the value at 3,4 in A with the values at
 2,1 in vals
```

FINAL MATRIX

```
%This block creates final matrix H by manipulating values from matrix
 A
X = A(1,:) + A(2,:) + A(3,:) + A(4,:); %Takes the sum of the values in
 each column of A
G = [A;X]; %Concatenates vector X to the bottom of matrix A to create
 matrix G
Y = G(:,1) + G(:,2) + G(:,3) + G(:,4); %Takes the sums of the values
 in each row of matrix G
H = [G Y]; %Concatenates vector Y to the right of matrix G to create
 matrix H
H(5,5) = H(1,1) + H(2,2) + H(3,3) + H(4,4); %Assigns H(5,5) to the sum
 of the diagonals from top left to bottom right
```

FORMATTED TEXT DISPLAY

```matlab
%This block will print the final outputs of the program
fprintf('After doing step 8.e, the value in the center of H is %.0f.
\n',H(3,3))
fprintf('After doing step 8.e, the value in the upper left
 of H is %.0f, and the value in the upper right of H is %.0f.
\n',H(1,1),H(1,5))
fprintf('After doing step 8.e, the value in the lower left of H is
 %.0f, and the value in lower right of H is %.0f.\n',H(5,1),H(5,5))

After doing step 8.e, the value in the center of H is 11.
After doing step 8.e, the value in the upper left of H is 1, and the
 value in the upper right of H is 34.
After doing step 8.e, the value in the lower left of H is 34, and the
 value in lower right of H is 34.
```

ACADEMIC INTEGRITY STATEMENT

We have not used source code obtained from any other unauthorized source, either modified or unmodified. Neither have we provided access to our code to another. The script we are submitting is our own original work.

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