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```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
% ...
%
% Assignment Information
%   Assignment:      PS 02, Problem 1
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%   Team ID:         005
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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

```
A([1:7],[1:7]) = 10; %a. Use the built-in MATLAB function ones to
    create a 7x7 matrix filled with 10s.
A([2:6],[2:6]) = 9; %b. Using matrix manipulations, replace the inner
    5x5 matrix with 9s.
A([3:5],[3:5]) = 8; %c. Using matrix manipulations, replace the inner
    3x3 matrix with 8s.
A(4,4) = 7; %d. Using matrix manipulations, replace the
    innermost value with a 7.
```

COPY VECTORS

```
B = A(4,[4:7]); %a. Copy from A, a 4-element row vector that counts
    up from 7 to 10 and assign it to B.
```

```
C = A(4, [2:4]); %b. Copy from A, a 3-element row vector that counts
down from 9 to 7 and assign it to C.
D = A([4:7],4); %c. Copy from A, a 4-element column vector that
counts up from 7 to 10 and assign it to D
E = A([2:4], 4); %d. Copy from A, a 3-element column vector that
counts down from 9 to 7 and assign it to E.
```

REPLACE MATRIX ELEMENTS

a. Use only vectors B-E, as appropriate, to replace the first row of A as shown below. Continue to use only vectors B-E, as appropriate, to replace the first column of A, the last row of A, and the last column of A as shown below.

```
A([1:4], 1) = D;
A(1, [1:4]) = B;
A(1,[5:7]) = C;
A([1:4], 7) = D;
A([5:7], 7) = E;
A([5:7], 1) = E;
A(7, [1:4]) = B;
A(7, [5:7]) = C;
```

```
% b. In the top left corner of A, replace the 7 with the sum of the
three values adjacent to it using
% array indexing. See PS01, Problem 5 "Useful MATLAB Commands" in the
green box for help
```

```
% with array indexing.
```

```
% Repeat for the top right corner of A, the bottom right corner of A,
and the bottom left corner of
```

```
% A.
```

```
A(1) = A(2) + A(8) + A(9);
A(7) = A(6) + A(13) + A(14);
A(43) = A(36) + A(37) + A(44);
A(49) = A(41) + A(42) + A(48);
```

```
% c. Replace the center value of A with the sum of the eight
surrounding values.
```

```
A(25) = A(17) + A(18) + A(19) + A(24) + A(26) + A(31) + A(32) + A(33);
```

CONCATENATION

```
%a. Create a vector X that contains the sums of the columns of A.
```

```
X(:,1) = sum(A([1:7],1));
X(:,2) = sum(A([1:7],2));
X(:,3) = sum(A([1:7],3));
X(:,4) = sum(A([1:7],4));
X(:,5) = sum(A([1:7],5));
```

```

X(:,6) = sum(A([1:7],6));
X(:,7) = sum(A([1:7],7));

% b. Concatenate vector X to the bottom of matrix A (from Step 7.c) to
    create a new matrix, B.
% Concatenation requires the use of square brackets.
B = cat(1, A, X)

%c. Create a vector Y that contains the sums of the rows of B.
Y(1,:) = sum(B(1, [1:7]));
Y(2,:) = sum(B(2, [1:7]));
Y(3,:) = sum(B(3, [1:7]));
Y(4,:) = sum(B(4, [1:7]));
Y(5,:) = sum(B(5, [1:7]));
Y(6,:) = sum(B(6, [1:7]));
Y(7,:) = sum(B(7, [1:7]));
Y(8,:) = sum(B(8, [1:7]));
%d. Concatenate vector Y to the right of matrix B (from Step 8.b) to
    create a new matrix, C.
% Concatenation requires the use of square brackets.
C = cat(2, B, Y)

```

B =

25	8	9	10	9	8	25
8	9	9	9	9	9	8
9	9	8	8	8	9	9
10	9	8	64	8	9	10
9	9	8	8	8	9	9
8	9	9	9	9	9	8
25	8	9	10	9	8	25
94	61	60	118	60	61	94

C =

25	8	9	10	9	8	25	94
8	9	9	9	9	9	8	61
9	9	8	8	8	9	9	60
10	9	8	64	8	9	10	118
9	9	8	8	8	9	9	60
8	9	9	9	9	9	8	61
25	8	9	10	9	8	25	94
94	61	60	118	60	61	94	548

DISPLAY

```

%In the DISPLAY section of your script file, use three fprintf
statements to display your results as shown:

```

```
fprintf('\nAfter doing step 7.c, the value in the center of A is %.2f\n', A(25))
fprintf('After doing step 8.d, the value in the upper left of C is %.2f and the value in the upper right of C is %.2f\n', C(1), C(43))
fprintf('After doing step 8.d, the value in the lower left of C is %.2f and the value in the lower right of C is %.2f\n', C(7), C(49))
```

```
After doing step 7.c, the value in the center of A is 64.00
After doing step 8.d, the value in the upper left of C is 25.00 and
the value in the upper right of C is 9.00
After doing step 8.d, the value in the lower left of C is 25.00 and
the value in the lower right of C is 25.00
```

ACADEMIC INTEGRITY STATEMENT

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

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