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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
%You are an agricultural engineer tasked with analyzing data collected
 by
%remote sensing equipment to minimize the effect of weeds on
 agriculture,
%by helping farmers identify and target areas suffering the most weed
%infestation.
%
% Assigment Information
%   Assignment:     PS 02, Problem 3
%   Author:         Ethan Hotson, ehotson@purdue.edu
%   Team ID:        009-01
%   Contributor:    None
%   My contributor(s) helped me:
%     [ ] understand the assignment expectations without
%         telling me how they will approach it.
%     [ ] understand different ways to think about a solution
%         without helping me plan my solution.
%     [ ] think through the meaning of a specific error or
%         bug present in my code without looking at my code.
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
```

INITIALIZATION

```
weedData=load('Data_weed_percent_fieldA152nF.txt');%Loads the weed
 percent data
```

CALCULATIONS

```
numPixels=numel(weedData);%Counts the number of pixels are recorded in
 the data
```

```
weedMean=mean(weedData)%Finds the mean weed percentage of each column
 of the data

weedColumnMax=max(weedMean);%Finds the column with the highest weed
 percentage

[maxRow maxColumn]=find(weedMean==weedColumnMax);%Finds row and column
 of the max column weed percentage

plantDom=find(weedData<=0.15);%Finds the plant dominant pixels

numPlantDom=numel(plantDom);%Counts the plant dominant pixels

[plantDomRow,plantDomCol]=find(weedData(:,:)<=0.15);%Finds the
 coordinates of plant dominant pixels

plantDomAvg=sum(weedData([plantDomRow,plantDomCol]),'all')/
numPlantDom;%Finds the average weed percent in the plant dominated
 pixels

criticalPix=find(0.75<=weedData<=0.95);%Finds the pixels at critical
 weed levels

numCritPix=numel(criticalPix);%Counts the pixels at critical weed
 levels

[critRows,critColumns]=find(weedData>0.95);%Finds the coordinates of
 pixels that must be visually inspected
```

```
weedMean =

  Columns 1 through 7

    0.0220    0.0230    0.0835    0.1105    0.0675    0.0505    0.0675

  Columns 8 through 14

    0.0265    0.0250    0.0350    0.0515    0.0295    0.0350    0.0280

  Columns 15 through 20

    0.0265    0.2305    0.3055    0.5360    0.2765    0.2595
```

FORMATTED TEXT DISPLAYS

```
%Answer to Question A
fprintf('Question A: \n')
fprintf('Number of field pixels in the data set: %.0f\n',numPixels)
```

```
%Answer to Question B
fprintf('Question B: \n')
fprintf('Column with the highest average weed percent: %.0f
\n',maxColumn)
fprintf('Average weed percentage of this column: %.4f
\n',weedColumnMax)

%Answer to Question C
fprintf('Question C: \n')
fprintf('Number of pixels that have dominant plants: %.0f
\n',numPlantDom)
fprintf('Average weed percentage of these pixels: %.4f\n',plantDomAvg)

%Answer to Question D
fprintf('Question D: \n')
fprintf('Number of field pixels that require urgent weed treatment:
 %.0f\n',numCritPix)

%Answer to Question E
fprintf('Question E: \n')
fprintf('Coordinates ([row(s), columns(s)]} of pixel(s) requiring
 immediate visual inspection:\n')
disp([critRows critColumns])
```

```
Question A:
Number of field pixels in the data set: 400
Question B:
Column with the highest average weed percent: 18
Average weed percentage of this column: 0.5360
Question C:
Number of pixels that have dominant plants: 329
Average weed percentage of these pixels: 0.0433
Question D:
Number of field pixels that require urgent weed treatment: 393
Question E:
Coordinates ([row(s), columns(s)]} of pixel(s) requiring immediate
 visual inspection:
    11    18
```

ACADEMIC INTEGRITY STATEMENT

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

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