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```
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
% ENGR 132
% Program Description
% You are a data processing engineer, who has been tasked to analyze
% data
% about volcanoes to determine how high-altitude imaging data can be
% used
% to help volcanologists determine the state of volcanoes.
%
% Assignment Information
%   Assignment:      PS 02, Problem 2
%   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

```
imageData=csvread('Data_volcano_list.csv',1,3);%Reads the data given
by the sattelites,
%removing the first line of headings and the first 3 lines of the text
data
```

---

# CALCULATIONS

```
polarVolc=find(imageData(:,1)>=50);%Finds the volcanoes visible to the
PoLAR viewer

numPolVolc=numel(polarVolc);%Counts the volcanoes visible to the PoLAR
viewer

avPolarVolAlt=sum(imageData(polarVolc,3))/numel(polarVolc);%Finds the
average alt of the visible volcanoes

viiVolc=find((imageData(:,3)>2500)&(imageData(:,1)<=0));%Finds the
volcanoes visible to VII that had altitudes greater than 2500m

stratoVii=find(121<=viiVolc<=395);%Finds the stratovolcanoes visible
to VII

numStratVII=numel(stratoVii);%Counts the stratovolcanoes visible to
VII

stratoMin=min(imageData((viiVolc(stratoVii)),3));%Finds the minimum
altitude of the stratovolcanoes visible to VII

stratoMax=max(imageData((viiVolc(stratoVii)),3));%Finds the max
altitude of the stratovolcanoes visible to VII

stratoACP=find((-39.5<=imageData(121:395,1)<=39.5));%Finds the
stratovolcanoes visible to ACP

nonStratACP=find((-39.5<=imageData(:,1)<=39.5));%Finds the non-
stratovolcanoes visible to ACP

numStratoACP=numel(stratoACP)%Counts the number of stratovolcanoes
visible to ACP

numNonStratACP=numel(nonStratACP)%Counts the non-stratovolcanoes
visible to ACP

mascStrat=find((100<=(imageData(121:395,1))<145)|
(-140<(imageData(121:395,1)<=-120)));%Finds the stratovolcanoes
detectable by MASC

numMASC=numel(mascStrat);%Counts how many stratovolcanoes are detected
by MASC

mascAvg=sum(imageData(find((100<=(imageData(121:395,1))<145)|
(-140<(imageData(121:395,1)<=-120))),3))/numMASC%Finds the average
altitude of
%the stratovolcanoes detected by MASC
```

---

```
numStratoACP =
```

```
275
```

```
numNonStratACP =
```

```
417
```

```
mascAvg =
```

```
1.7897e+03
```

---

## FORMATTED TEXT DISPLAYS

```
%Prints answer to Question A
```

```
fprintf('Question A:\n')
```

```
fprintf('Number of volcanoes visible to PoLAR viewer: %.0f\n', numPolVolc)
```

```
fprintf('Average elevation: %.0f\n', avPolarVolAlt)
```

```
%Prints answer to Question B
```

```
fprintf('Question B:\n')
```

```
fprintf('Number of stratovolcanoes visible in VII imager: %.0f\n', numStratVII)
```

```
fprintf('Minimum elevation: %.0f\n', stratoMin)
```

```
fprintf('Maximum elevation: %.0f\n', stratoMax)
```

```
%Prints answer to Question C
```

```
fprintf('Question C: \n')
```

```
fprintf('Number of stratovolcanoes visible to ACP-1: %.0f\n', numStratoACP)
```

```
fprintf('Number of non-stratovolcanoes visible to ACP-1: %.0f\n', numNonStratACP)
```

```
%Prints answer to Question D
```

```
fprintf('Question D: \n')
```

```
fprintf('Number of stratovolcanoes visible to MASC: %.0f\n', numMASC)
```

```
fprintf('Average elevation: %.0f\n', mascAvg)
```

```
Question A:
```

```
Number of volcanoes visible to PoLAR viewer: 81
```

```
Average elevation: 2061
```

```
Question B:
```

```
Number of stratovolcanoes visible in VII imager: 45
```

```
Minimum elevation: 2518
```

```
Maximum elevation: 6887
```

```
Question C:
```

---

*Number of stratovolcanoes visible to ACP-1: 275*  
*Number of non-stratovolcanoes visible to ACP-1: 417*  
*Question D:*  
*Number of stratovolcanoes visible to MASC: 275*  
*Average elevation: 1790*

---

## **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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