In this assessment, you will prepare your images for classification and extract saturation-based features.

These features will be used to train a classification model in the next section, so it is important that you take this quiz as many times as necessary to ensure that your data set is correctly prepared and ready for classification.

```
fileLocation = uigetdir();
dsroadSide = imageDatastore(fileLocation,"IncludeSubFolders",true,"LabelSource","foldernames");
categories(dsroadSide.Labels)
```

```
ans = 2×1 cell
'No Snow'
'Snow'
```

Organize the Roadside Ground Cover images (which can be found in the "MathWorks Images" subfolder of the "Data" folder in the course files download) into an image datastore. Use the subfolder names "Snow" and "No Snow" as the image labels.

Then split the datastore into training and testing subsets while keeping **85%** of the images in the training datastore.

How many images are labeled as "Snow" in the **training** datastore?

```
[dsTrain,dsTest] = splitEachLabel(dsroadSide,0.85,"randomize");
countEachLabel(dsTrain)
```

```
ans = 2×2 table
```

	Label	Count
1	No Snow	85
2	Snow	85

```
%img = imread("Data/MathWorks Images/Roadside Ground Cover/No Snow/RoadsideA_1.jpg");
%result = imgSat(img)
```

Question 2: What is the **mean saturation** for the "No Snow" labeled image "RoadsideA_1.jpg"?

Question 3: What is the **standard deviation of the saturation** for the "No Snow" labeled image "RoadsideA_1.jpg"?

Question 4

Create a table for the training dataset that contains a row for each image and a column for its:

- Filename
- Label (either "Snow" or "No Snow")
- Mean saturation

- Standard deviation of the saturation

```
roadSide = extractRoadSideFeature(dsTrain);
```

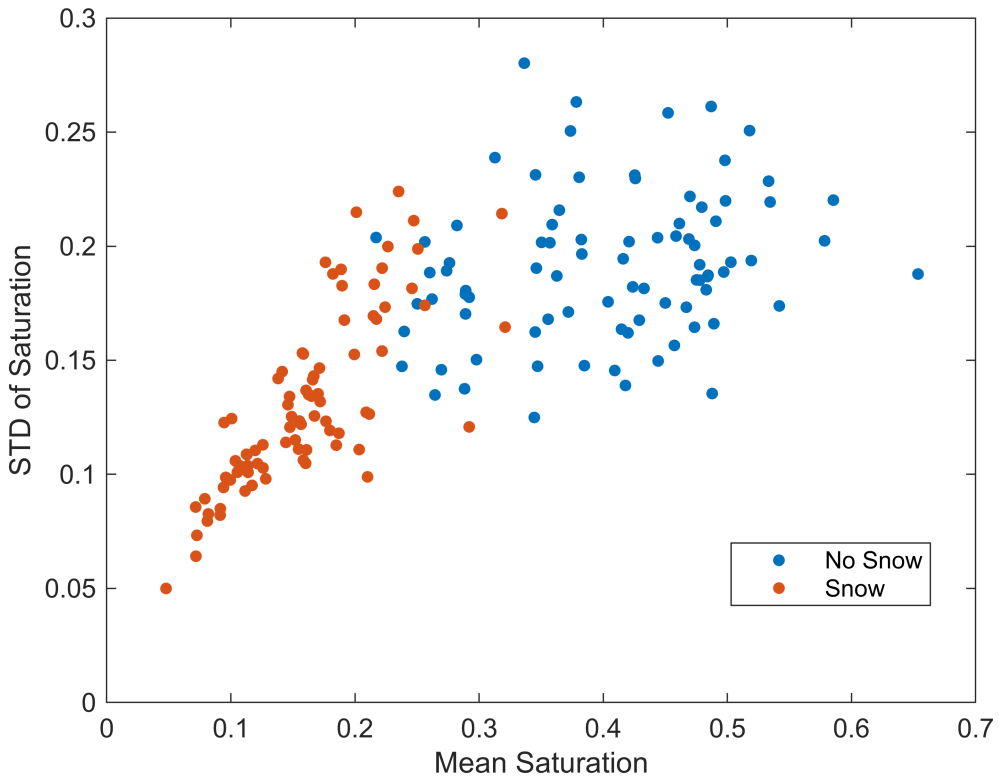
Save the Information Needed to Train a Model

Make a note of your current folder; this is where this line of code will save your .mat file; you will need it later.

```
save RoadSideFature.mat roadSide dsTrain dsTest
```

Once completed, make a grouped scatter plot of each image's mean saturation on the x-axis and the standard deviation of the saturation on the y-axis. What is the result?

```
gscatter(roadSide.intensityAvg,roadSide.intensitySTD,roadSide.label)
xlabel("Mean Saturation")
ylabel("STD of Saturation")
```




```
function roadSide = extractRoadSideFeature(ds)

intensityAvg = [];
intensitySTD = [];
imgName = [];
```

```
while hasdata(ds)

    [img,info] = read(ds);

    imgHSV = rgb2hsv(img); % Convert an RGB image to HSV
    img = imgHSV(:,:,2); % Save the image saturation data

    intensityAvg = [intensityAvg; mean(img(:))];
    intensitySTD = [intensitySTD; std(img(:))];

    [~,name,ext] = fileparts(info.Filename);
    imgName = [imgName; string(name) + string(ext)];

end

label = categorical(ds.Labels);
roadSide = table(label,imgName,intensityAvg,intensitySTD);
end



%function stdSat = imgSat(img)
%imgHSV = rgb2hsv(img); % Convert an RGB image to HSV
%imgSaturation = imgHSV(:,:,2); % Save the image saturation data
%meanSat = mean(imgSaturation(:));
%stdSat = std(imgSaturation(:));
%end
```