// Code is taken from DEMO repository of GEE platform

// This demonstration uses hand-located points to train a classifier.

// Each training point has a field called 'landcover' containing

// class labels at that location. The following block contains

// construction code for the points. Hover on the 'urban' variable

// and click, 'Convert' in the dialog.

var urban = /\* color: #ff0000 \*/ee.FeatureCollection(

[ee.Feature(

ee.Geometry.Point([-122.40898132324219, 37.78247386188714]),

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ee.Feature(

ee.Geometry.Point([-122.40623474121094, 37.77107659627034]),

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ee.Feature(

ee.Geometry.Point([-122.39799499511719, 37.785187237567705]),

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ee.Feature(

ee.Geometry.Point([-122.39936828613281, 37.772162125840445]),

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ee.Feature(

ee.Geometry.Point([-122.41104125976562, 37.76890548932033]),

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ee.Feature(

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ee.Feature(

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ee.Feature(

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ee.Feature(

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ee.Feature(

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"system:index": "15"

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ee.Feature(

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ee.Feature(

ee.Geometry.Point([-122.27096557617188, 37.820452055421086]),

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ee.Geometry.Point([-122.40966796875, 37.768362702622596]),

{

"landcover": 0,

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vegetation = /\* color: #3b8b00 \*/ee.FeatureCollection(

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ee.Feature(

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ee.Feature(

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water = /\* color: #0300ff \*/ee.FeatureCollection(

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ee.Feature(

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"system:index": "8"

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ee.Feature(

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ee.Geometry.Point([-122.40005493164062, 37.86925246182428]),

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ee.Feature(

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ee.Feature(

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ee.Feature(

ee.Geometry.Point([-122.24040985107422, 37.61504728801728]),

{

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"system:index": "30"

})]);

// Load the Landsat 8 scaled radiance image collection.

var landsatCollection = ee.ImageCollection('LANDSAT/LC08/C01/T1')

.filterDate('2017-01-01', '2017-12-31');

// Make a cloud-free composite.

var composite = ee.Algorithms.Landsat.simpleComposite({

collection: landsatCollection,

asFloat: true

});

// Merge the three geometry layers into a single FeatureCollection.

var newfc = urban.merge(vegetation).merge(water);

// Use these bands for classification.

var bands = ['B2', 'B3', 'B4', 'B5', 'B6', 'B7'];

// The name of the property on the points storing the class label.

var classProperty = 'landcover';

// Sample the composite to generate training data. Note that the

// class label is stored in the 'landcover' property.

var training = composite.select(bands).sampleRegions({

collection: newfc,

properties: [classProperty],

scale: 30

});

// Train a CART classifier.

var classifier = ee.Classifier.smileCart().train({

features: training,

classProperty: classProperty,

});

// Print some info about the classifier (specific to CART).

print('CART, explained', classifier.explain());

// Classify the composite.

var classified = composite.classify(classifier);

Map.centerObject(newfc);

Map.addLayer(classified, {min: 0, max: 2, palette: ['red', 'green', 'blue']});

// Optionally, do some accuracy assessment. Fist, add a column of

// random uniforms to the training dataset.

var withRandom = training.randomColumn('random');

// We want to reserve some of the data for testing, to avoid overfitting the model.

var split = 0.7; // Roughly 70% training, 30% testing.

var trainingPartition = withRandom.filter(ee.Filter.lt('random', split));

var testingPartition = withRandom.filter(ee.Filter.gte('random', split));

// Trained with 70% of our data.

var trainedClassifier = ee.Classifier.smileRandomForest(5).train({

features: trainingPartition,

classProperty: classProperty,

inputProperties: bands

});

// Classify the test FeatureCollection.

var test = testingPartition.classify(trainedClassifier);

// Print the confusion matrix.

var confusionMatrix = test.errorMatrix(classProperty, 'classification');

print('Confusion Matrix', confusionMatrix);