//Step 2

// Filter image collection by date and region of interest

var filtered = sentinel2. filterBounds (aoi)

.filterDate( '2022-01-01', '2022-04-30')

.filterMetadata( 'CLOUDY\_PIXEL\_OVER\_LAND\_PERCENTAGE', 'less\_than', 10)

.median()

print (filtered)

//Step 3

// Select bands for classification

var bands = filtered.select('B2', 'B3', 'B4', 'B8').clip(aoi);

// Step 4: Create a color composite-- map FCC

var vis ={

min: 0,

max: 3600,

};

Map.addLayer(bands.select('B8','B4','B3'),vis,'Las Vegas BRG: G-R-NIR');

// Step 5

// Make the training dataset.

var training = bands.sample({

region: aoi,

scale: 10,

numPixels: 10000

});

// Instantiate the clusterer and train it.

var clusterer10 = ee.Clusterer.wekaKMeans(10).train(training);

// Cluster the input using the trained clusterer.

var result = bands.cluster(clusterer10);

print (result);

//Step 6

// Display the clusters with random colors.

vis = ['#a6cee3', '#1f78b4', '#b2df8a', '#33a02c', '#fb9a99',

'#e31a1c', '#fdbf6f', '#ff7f00', '#cab2d6', '#6a3d9a'];

Map.addLayer(result, {min: 0, max: 9, palette: vis}, 'clusters');

//Step 7

//create histogram of result

var histogramcluster10 = ui.Chart.image.histogram({

image:result.select('cluster'),

region:aoi,

scale:1000,

minBucketWidth:1

});

histogramcluster10.setOptions({

title:'cluster Kmeans result'

});

// Display chart

print (histogramcluster10);

//Change the number of cluster to 15

// Step 5

// Make the training dataset.

// var training = bands.sample({

// region: aoi,

// scale: 10,

// numPixels: 10000

// });

// Instantiate the clusterer and train it.

var clusterer15 = ee.Clusterer.wekaKMeans(15).train(training);

// Cluster the input using the trained clusterer.

var result = bands.cluster(clusterer15);

print (result);

//Step 6

// Display the clusters with random colors.

vis = ['#a6cee3', '#1f78b4', '#b2df8a', '#33a02c', '#fb9a99',

'#e31a1c', '#fdbf6f', '#ff7f00', '#cab2d6', '#6a3d9a', '#edf8b1', '#deebf7','#efedf5','#e0f3db'];

Map.addLayer(result, {min: 0, max: 14, palette: vis}, 'clusters15');

//Step 7

//create histogram of result

var histogramcluster15 = ui.Chart.image.histogram({

image:result.select('cluster'),

region:aoi,

scale:1000,

minBucketWidth:1

});

histogramcluster15.setOptions({

title:'cluster1 Kmeans result'

});

// Display chart

print (histogramcluster15);

//

// Step 5

// Make the training dataset.

// var training = bands.sample({

// region: aoi,

// scale: 10,

// numPixels: 10000

// });

// Instantiate the clusterer and train it.

var clusterer5 = ee.Clusterer.wekaKMeans(5).train(training);

// Cluster the input using the trained clusterer.

var result = bands.cluster(clusterer5);

print (result);

//Step 6

// Display the clusters with random colors.

vis = ['#a6cee3', '#1f78b4', '#b2df8a', '#33a02c', '#fb9a99'];

Map.addLayer(result, {min: 0, max: 4, palette: vis}, 'clusters5');

//Step 7

//create histogram of result

var histogramcluster5 = ui.Chart.image.histogram({

image:result.select('cluster'),

region:aoi,

scale:1000,

minBucketWidth:1

});

histogramcluster5.setOptions({

title:'cluster2 Kmeans result'

});

// Display chart

print (histogramcluster5);