GE 107
Tinkering Lab

Assignment- 3
Report

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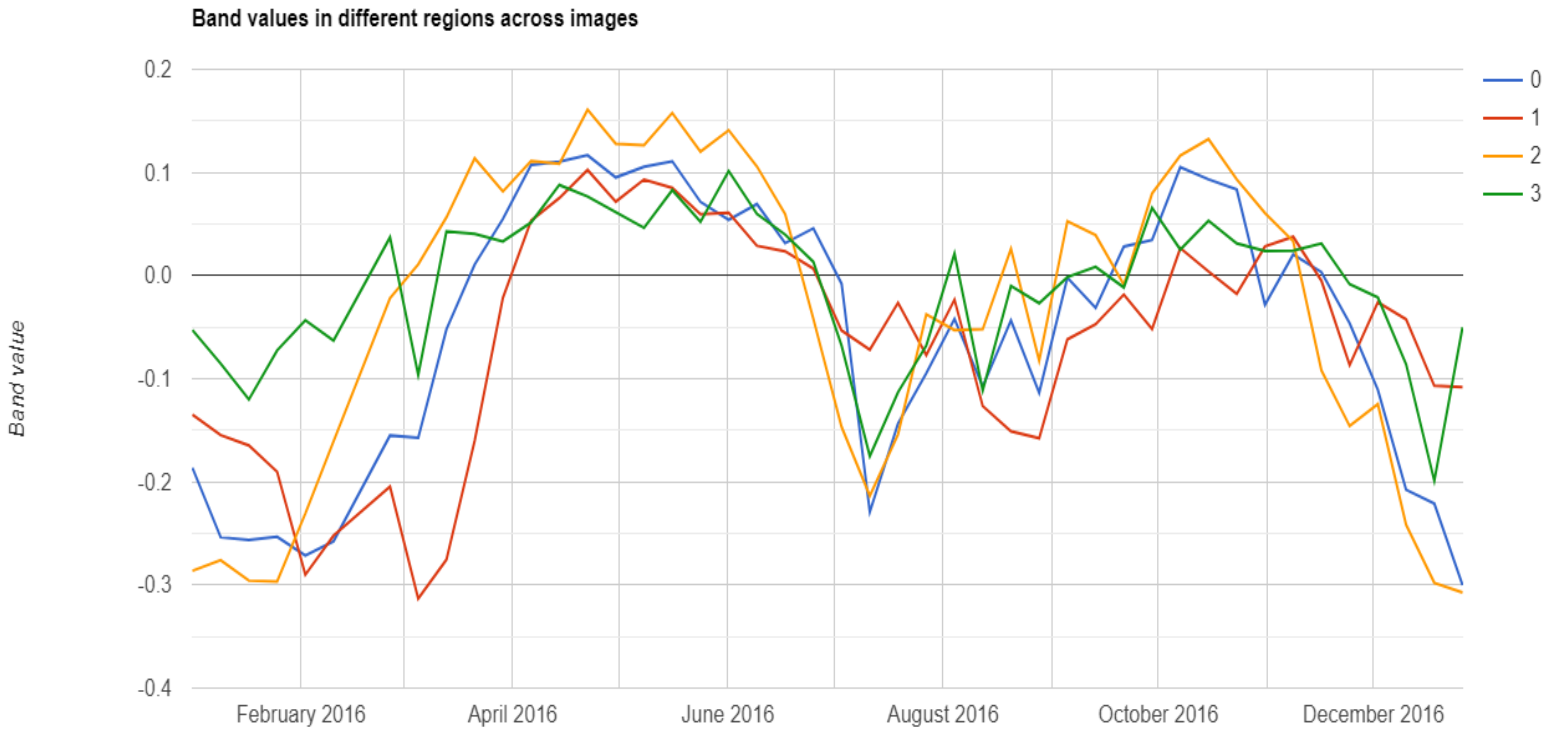
GEE Code:

https://code.earthengine.google.co.in/485672c2dda9fa76cf1299e9c4b6542c
Also attached as a text file in the Zipped folder

CSV File:

Attached as excel file in the Zipped folder

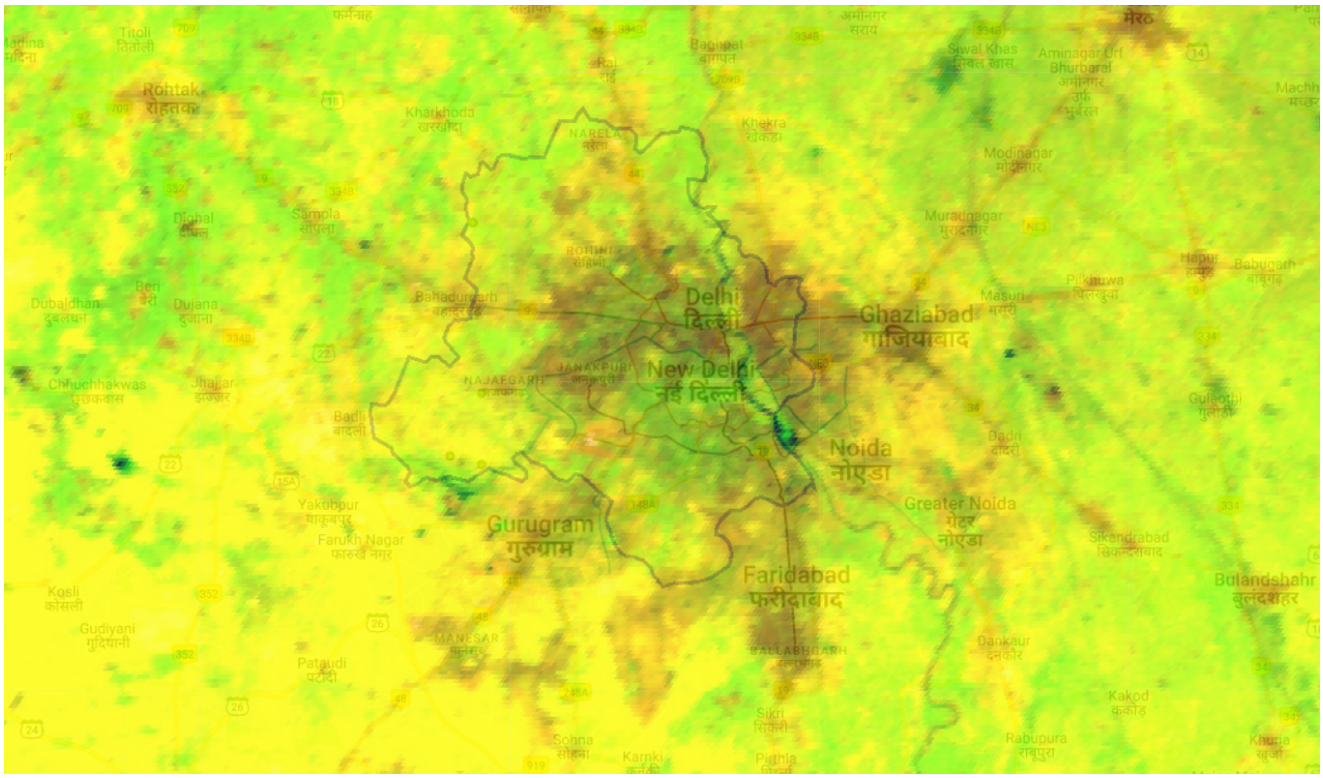
Time Series Graph:



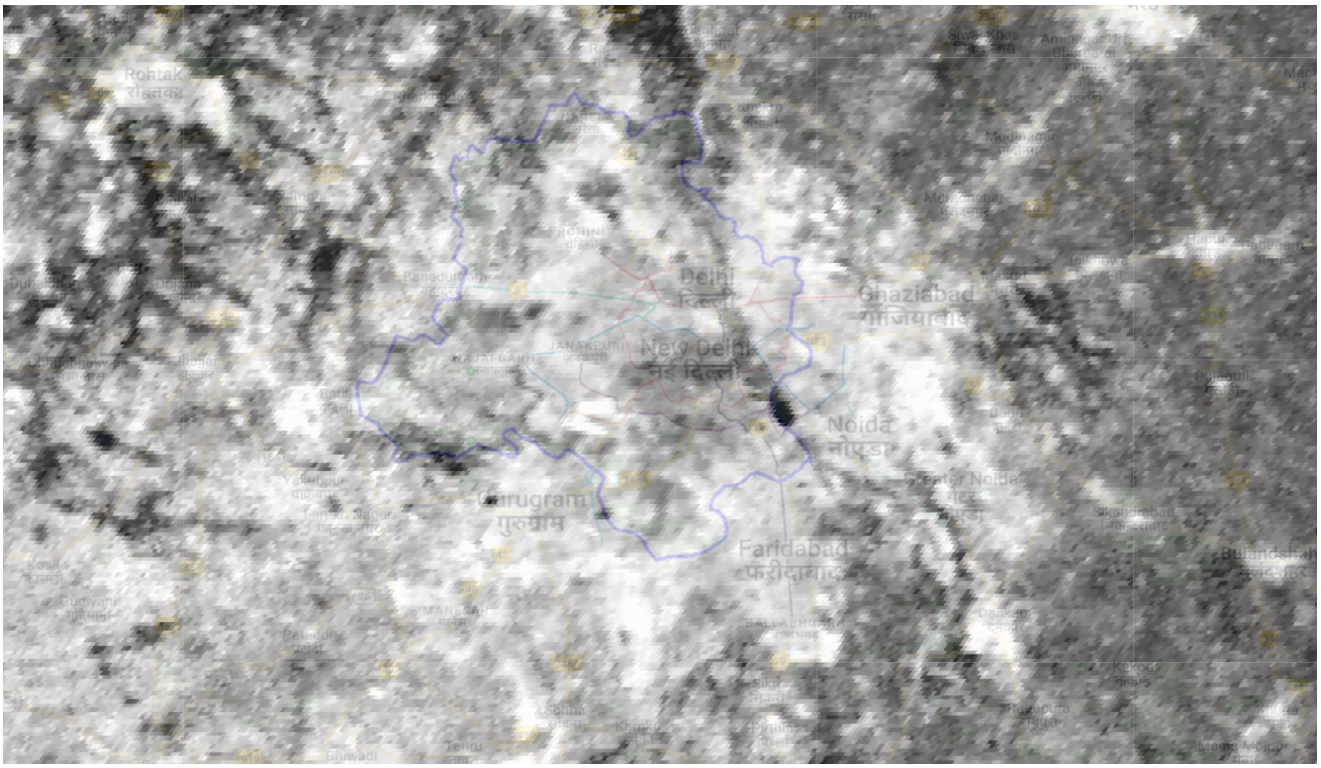
0-3: represents the number of random points selected
X-axis: represents the time period of the selected year 2016
Y-axis: represents the NDBI values at the selected points

Spectral Index Maps:

MODIS Composite Layer



Collection Layer:



Brief Writeup:

For the following experiment, I have selected the following requirements:
Data used: MODIS
The place selected: Delhi (Coordinates - 77.23149 , 28.65195)
Number of points selected: 4
Year selected: 2016 (2016-01-01 to 2016-12-31)
Spectral Index selected: NDBI (Normalized Difference Builtup Index)

About the Spectral Index:

It is used to study urbanization as it highlights the urban areas.

NDBI = (SWIR – NIR)/(SWIR + NIR)

Normalized Difference Built-up Index (NDBI) is a spectral index used to analyze built-up areas. This index uses two bands: the short-wave infrared (SWIR) and the near-infrared (NIR). Areas with more built-up structures reflect shortwave-infrared (SWIR) more while areas with less built-up have a low Near-Infrared (NIR) reflectance. NDBI values range from -1 to +1 where the negative values represent areas with no built-up structures and positive values represent highly built-up areas.
The SWIR band is referred to by sur_refl_b06 and the NIR band is referred as sur_refl_b02 in the GEE language.

Graph and Map Explanation:

We have selected Delhi as an area of interest and analyzed its urban population for a year. We obtained the above time-series graph. Analyzing the graph, we found that the maximum NDBI values are obtained in the duration of April 2016 to June 2016 and then in October,2016. The minimum values are obtained in March 2016 and the end of December.
Analyzing the spectral index maps, we can say that the central regions of Delhi have a lot of urban areas as they are very dark in color/shade while the north-western regions are less urbanized as they are light-colored.

Code Explanation:

Mainly we need to check the following parameters in the code: Place (Name and Coordinates), No. of points, Year Selected, Spectral index selected (Name and formula).
