2018033_CV_HW5: **Q1 Done (Programming Approach)**

Code Files Description:

- lbp.py:- The main code file
- Import image in grayscale mode.
- Split image into 4 patches
- Padding each patch with 0's with a width of 1.
- For each pixel in the patch, the surrounding 8 pixels (3x3 sub-matrix) are considered whether they have a value smaller or larger than the pixel under consideration.
- A histogram is created by using these 8-bit values calculated for every pixel converted to decimal equivalents giving 256 features for the patch.
- Each of the 4 patches gives 256 features totaling to 4x256 = 1024 features.

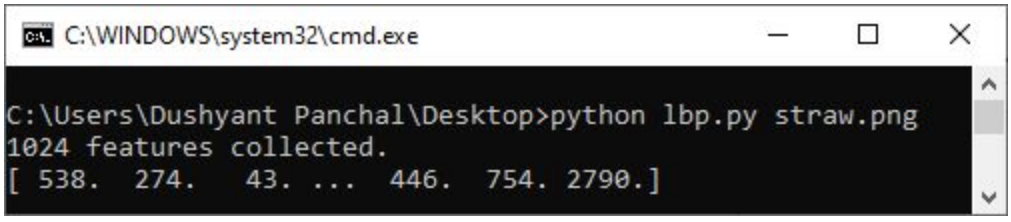
How To Run?

- python <code-file> <image-file>
- E.g. python lbp.py straw.png

Results:

- Input Image

- Terminal Output



- Features Created

[538.0, 274.0, 43.0, 170.0, 260.0, 30.0, 197.0, 806.0, 43.0, 27.0, 3.0, 9.0, 194.0, 21.0, 341.0, 2170.0, 283.0, 113.0, 21.0, 28.0, 30.0, 5.0, 22.0, 45.0, 156.0, 28.0, 8.0, 9.0, 799.0, 38.0, 1762.0, 2265.0, 66.0, 24.0, 8.0, 12.0, 18.0, 4.0, 15.0, 48.0, 4.0, 3.0, 0.0, 0.0, 14.0, 2.0, 14.0, 30.0, 201.0,

36.0, 22.0, 16.0, 29.0, 2.0, 49.0, 38.0, 363.0, 18.0, 15.0, 14.0, 1481.0, 32.0, 1087.0, 598.0, 305.0, 33.0, 14.0, 23.0, 114.0, 3.0, 34.0, 45.0, 14.0, 2.0, 2.0, 3.0, 26.0, 2.0, 23.0, 16.0, 27.0, 3.0, 0.0, 0.0, 4.0, 0.0, 1.0, 1.0, 32.0, 4.0, 2.0, 2.0, 49.0, 1.0, 24.0, 17.0, 206.0, 33.0, 19.0, 32.0, 32.0, 3.0, 11.0, 32.0, 13.0, 0.0, 2.0, 4.0, 21.0, 3.0, 14.0, 19.0, 956.0, 46.0, 53.0, 46.0, 50.0, 3.0, 32.0, 34.0, 2097.0, 31.0, 33.0, 37.0, 2105.0, 21.0, 587.0, 438.0, 49.0, 174.0, 4.0, 328.0, 26.0, 28.0, 8.0, 1938.0, 5.0, 11.0, 0.0, 12.0, 7.0, 35.0, 10.0, 1310.0, 26.0, 39.0, 2.0, 23.0, 1.0, 1.0, 1.0, 20.0, 27.0, 17.0, 1.0, 8.0, 41.0, 40.0, 30.0, 601.0, 9.0, 5.0, 0.0, 10.0, 0.0, 4.0, 0.0, 24.0, 0.0, 0.0, 0.0, 0.0, 1.0, 0.0, 2.0, 22.0, 11.0, 15.0, 1.0, 14.0, 4.0, 2.0, 1.0, 29.0, 7.0, 18.0, 0.0, 15.0, 27.0, 23.0, 24.0, 363.0, 269.0, 782.0, 8.0, 1419.0, 40.0, 49.0, 17.0, 2027.0, 14.0, 65.0, 0.0, 36.0, 21.0, 42.0, 15.0, 563.0, 42.0, 34.0, 2.0, 23.0, 0.0, 2.0, 0.0, 28.0, 29.0, 45.0, 0.0, 22.0, 36.0, 46.0, 22.0, 449.0, 389.0, 1716.0, 14.0, 1241.0, 33.0, 18.0, 17.0, 633.0, 14.0, 36.0, 2.0, 22.0, 17.0, 32.0, 17.0, 374.0, 2133.0, 2232.0, 44.0, 691.0, 18.0, 33.0, 28.0, 519.0, 1503.0, 754.0, 16.0, 447.0, 660.0, 569.0, 414.0, 10923.0, 642.0, 292.0, 47.0, 169.0, 243.0, 28.0, 177.0, 751.0, 67.0, 31.0, 2.0, 9.0, 202.0, 40.0, 368.0, 2189.0, 346.0, 83.0, 32.0, 26.0, 27.0, 4.0, 39.0, 48.0, 165.0, 37.0, 11.0, 24.0, 740.0, 45.0, 2298.0, 2476.0, 69.0, 37.0, 9.0, 16.0, 21.0, 2.0, 20.0, 77.0, 5.0, 4.0, 0.0, 2.0, 11.0, 7.0, 9.0, 36.0, 228.0, 38.0, 30.0, 20.0, 20.0, 2.0, 42.0, 35.0, 244.0, 21.0, 10.0, 13.0, 955.0, 27.0, 1167.0, 636.0, 294.0, 30.0, 13.0, 21.0, 131.0, 3.0, 35.0, 48.0, 20.0, 3.0, 2.0, 2.0, 30.0, 3.0, 12.0, 25.0, 35.0, 4.0, 3.0, 2.0, 2.0, 0.0, 3.0, 1.0, 39.0, 2.0, 3.0, 1.0, 58.0, 1.0, 18.0, 24.0, 234.0, 41.0, 17.0, 37.0, 31.0, 2.0, 21.0, 40.0, 16.0, 13.0, 1.0, 3.0, 19.0, 3.0, 13.0, 33.0, 975.0, 65.0, 64.0, 50.0, 64.0, 0.0, 38.0, 46.0, 1407.0, 33.0, 24.0, 11.0, 1766.0, 27.0, 652.0, 498.0, 56.0, 204.0, 7.0, 249.0, 22.0, 31.0, 8.0, 1814.0, 11.0, 18.0, 0.0, 12.0, 21.0, 42.0, 16.0, 1100.0, 37.0, 40.0, 8.0, 17.0, 4.0, 1.0, 4.0, 19.0, 23.0, 22.0, 1.0, 8.0, 43.0, 47.0, 43.0, 606.0, 3.0, 13.0, 0.0, 5.0, 2.0, 2.0, 1.0, 26.0, 0.0, 1.0, 0.0, 2.0, 2.0, 2.0, 2.0, 22.0, 17.0, 22.0, 0.0, 18.0, 1.0, 2.0, 3.0, 22.0, 10.0, 21.0, 2.0, 13.0, 28.0, 32.0, 24.0, 322.0, 208.0, 709.0, 8.0, 1060.0, 40.0, 47.0, 17.0, 1969.0, 19.0, 52.0, 3.0, 31.0, 15.0, 34.0, 19.0, 549.0, 43.0, 48.0, 5.0, 22.0, 1.0, 2.0, 7.0, 28.0, 43.0, 36.0, 1.0, 32.0, 38.0, 39.0, 28.0, 463.0, 360.0, 1719.0, 17.0, 1072.0, 30.0, 31.0, 14.0, 601.0, 10.0, 62.0, 2.0, 28.0, 23.0, 49.0, 20.0, 364.0, 2122.0, 2485.0, 49.0, 717.0, 36.0, 39.0, 44.0, 522.0, 1545.0, 771.0, 32.0, 412.0, 688.0, 529.0, 501.0, 11753.0, 1658.0, 586.0, 151.0, 337.0, 467.0, 67.0, 289.0, 826.0, 176.0, 85.0, 14.0, 33.0, 294.0, 87.0, 360.0, 1617.0, 618.0, 116.0, 66.0, 48.0, 54.0, 8.0, 87.0, 65.0, 331.0, 51.0, 17.0, 41.0, 867.0, 61.0, 1825.0, 977.0, 175.0, 94.0, 25.0, 63.0, 66.0, 7.0, 47.0, 106.0, 20.0, 8.0, 1.0, 5.0, 28.0, 8.0, 33.0, 89.0, 456.0, 59.0, 66.0, 39.0, 84.0, 4.0, 93.0, 74.0, 529.0, 39.0, 28.0, 32.0, 1630.0, 47.0, 1155.0, 503.0, 546.0, 69.0, 52.0, 65.0, 110.0, 4.0, 41.0, 60.0, 70.0, 10.0, 9.0, 11.0, 59.0, 4.0, 35.0, 47.0, 80.0, 13.0, 7.0, 10.0, 9.0, 1.0, 3.0, 3.0, 79.0, 5.0, 13.0, 8.0, 50.0, 3.0, 48.0, 23.0, 485.0, 122.0, 56.0, 97.0, 53.0, 3.0, 46.0, 68.0, 32.0, 19.0, 2.0, 10.0, 37.0, 14.0, 40.0, 84.0, 1239.0, 73.0, 117.0, 86.0, 84.0, 5.0, 69.0, 55.0, 1914.0, 44.0, 70.0, 68.0, 1382.0, 34.0, 586.0, 318.0, 199.0, 371.0, 10.0, 416.0, 72.0, 78.0, 31.0, 1451.0, 26.0, 61.0, 3.0, 29.0, 43.0, 112.0, 34.0, 1137.0, 88.0, 60.0, 11.0, 43.0, 6.0, 8.0, 9.0, 39.0, 56.0, 44.0, 4.0, 30.0, 98.0, 81.0, 81.0, 538.0, 22.0, 35.0, 3.0, 29.0, 14.0, 8.0, 1.0, 78.0, 3.0, 2.0, 0.0, 6.0, 8.0, 4.0, 3.0, 62.0, 35.0, 51.0, 8.0, 36.0, 16.0, 11.0, 6.0, 80.0, 46.0, 35.0, 1.0, 56.0, 83.0, 84.0, 68.0, 552.0, 390.0, 1088.0, 26.0, 1305.0, 57.0, 74.0, 47.0, 1131.0, 61.0, 101.0, 2.0, 76.0, 42.0, 83.0, 35.0, 638.0, 98.0, 79.0, 14.0, 45.0, 13.0, 6.0, 11.0, 32.0, 102.0, 98.0, 4.0, 69.0, 76.0, 71.0, 78.0, 347.0, 657.0, 2075.0, 38.0, 1397.0, 44.0, 55.0, 36.0, 736.0, 37.0, 120.0, 1.0, 81.0, 49.0, 96.0, 50.0, 710.0, 2492.0, 1776.0, 128.0, 766.0, 61.0, 45.0, 121.0, 437.0, 1576.0, 845.0, 59.0, 672.0, 730.0, 466.0, 726.0, 3153.0, 1345.0,

491.0, 119.0, 276.0, 380.0, 74.0, 279.0, 996.0, 165.0, 68.0, 18.0, 22.0, 324.0, 100.0, 494.0, 2311.0, 637.0, 102.0, 57.0, 52.0, 49.0, 7.0, 63.0, 63.0, 384.0, 60.0, 23.0, 25.0, 992.0, 73.0, 1777.0, 1337.0, 162.0, 62.0, 17.0, 49.0, 48.0, 3.0, 39.0, 97.0, 21.0, 13.0, 1.0, 3.0, 25.0, 6.0, 37.0, 104.0, 444.0, 60.0, 45.0, 44.0, 78.0, 6.0, 74.0, 82.0, 603.0, 33.0, 25.0, 25.0, 1419.0, 40.0, 1307.0, 621.0, 484.0, 62.0, 33.0, 57.0, 70.0, 2.0, 41.0, 48.0, 44.0, 6.0, 6.0, 4.0, 49.0, 4.0, 33.0, 48.0, 66.0, 6.0, 6.0, 6.0, 6.0, 0.0, 4.0, 3.0, 94.0, 5.0, 3.0, 11.0, 53.0, 6.0, 44.0, 39.0, 426.0, 76.0, 34.0, 62.0, 60.0, 5.0, 42.0, 65.0, 33.0, 5.0, 5.0, 6.0, 30.0, 13.0, 34.0, 90.0, 1595.0, 79.0, 101.0, 77.0, 75.0, 7.0, 78.0, 47.0, 2384.0, 59.0, 84.0, 63.0, 1464.0, 41.0, 755.0, 377.0, 171.0, 333.0, 22.0, 395.0, 51.0, 71.0, 24.0, 1504.0, 35.0, 50.0, 2.0, 32.0, 46.0, 87.0, 28.0, 1343.0, 77.0, 50.0, 14.0, 28.0, 11.0, 8.0, 6.0, 33.0, 72.0, 34.0, 2.0, 19.0, 76.0, 64.0, 62.0, 501.0, 17.0, 25.0, 4.0, 33.0, 4.0, 13.0, 2.0, 71.0, 5.0, 4.0, 1.0, 2.0, 4.0, 7.0, 5.0, 57.0, 32.0, 39.0, 5.0, 26.0, 6.0, 8.0, 6.0, 43.0, 30.0, 31.0, 1.0, 38.0, 62.0, 52.0, 45.0, 474.0, 373.0, 914.0, 21.0, 1383.0, 41.0, 54.0, 24.0, 902.0, 41.0, 85.0, 4.0, 54.0, 45.0, 56.0, 27.0, 529.0, 123.0, 69.0, 15.0, 42.0, 5.0, 2.0, 7.0, 28.0, 97.0, 69.0, 4.0, 40.0, 72.0, 37.0, 49.0, 316.0, 636.0, 1839.0, 39.0, 1220.0, 41.0, 46.0, 40.0, 571.0, 25.0, 97.0, 2.0, 55.0, 44.0, 78.0, 33.0, 622.0, 2734.0, 1738.0, 122.0, 642.0, 62.0, 29.0, 108.0, 383.0, 2056.0, 849.0, 76.0, 594.0, 927.0, 446.0, 754.0, 2790.0]