CS 435 FALL 2011 ASSIGNMENT-1 / UMUT CAN GENLIK/ 10.04.2011

1. Function that runs algorithm, which is in python programming language, of given question is attached to .zip file.
2. According to question if I choose different bucket sizes (I choose 2, 40, 80, 200 ) and run program for all three excel files and put the output data into an array in order to be used as a histogram following data is received. **(In order to get same result from my code user has to change file directory and bucket size by manually)**

**Bucket Size of 2 :**

|  |  |  |
| --- | --- | --- |
| **Matrices I1** | **Matrices I2** | **Matrices I3** |
| bucket 1 0  bucket 2 0  bucket 3 0  bucket 4 0  bucket 5 0  bucket 6 0  bucket 7 0  bucket 8 0  bucket 9 0  bucket 10 0  bucket 11 0  bucket 12 0  bucket 13 0  bucket 14 0  bucket 15 0  bucket 16 0  bucket 17 0  bucket 18 0  bucket 19 0  bucket 20 0  bucket 21 0  bucket 22 0  bucket 23 0  bucket 24 0  bucket 25 0  bucket 26 0  bucket 27 0  bucket 28 0  bucket 29 2  bucket 30 4  bucket 31 3  bucket 32 11  bucket 33 14  bucket 34 18  bucket 35 23  bucket 36 39  bucket 37 47  bucket 38 54  bucket 39 65  bucket 40 77  bucket 41 153  bucket 42 234  bucket 43 464  bucket 44 662  bucket 45 1005  bucket 46 1548  bucket 47 2059  bucket 48 2741  bucket 49 3355  bucket 50 4150  bucket 51 4453  bucket 52 4542  bucket 53 4060  bucket 54 3262  bucket 55 2975  bucket 56 2703  bucket 57 2492  bucket 58 2254  bucket 59 2150  bucket 60 1974  bucket 61 1770  bucket 62 1513  bucket 63 1361  bucket 64 1195  bucket 65 1142  bucket 66 1241  bucket 67 1190  bucket 68 1246  bucket 69 1122  bucket 70 1169  bucket 71 1250  bucket 72 1297  bucket 73 1308  bucket 74 1339  bucket 75 1473  bucket 76 1601  bucket 77 1796  bucket 78 1969  bucket 79 1934  bucket 80 2022  bucket 81 1877  bucket 82 1856  bucket 83 1774  bucket 84 1539  bucket 85 1206  bucket 86 1199  bucket 87 1156  bucket 88 1261  bucket 89 1357  bucket 90 1397  bucket 91 1254  bucket 92 1141  bucket 93 1139  bucket 94 1249  bucket 95 1509  bucket 96 1884  bucket 97 2374  bucket 98 2395  bucket 99 2535  bucket 100 2222  bucket 101 2128  bucket 102 2127  bucket 103 1978  bucket 104 1867  bucket 105 1810  bucket 106 1810  bucket 107 1745  bucket 108 1757  bucket 109 1715  bucket 110 1808  bucket 111 1645  bucket 112 1539  bucket 113 1402  bucket 114 1131  bucket 115 745  bucket 116 490  bucket 117 287  bucket 118 171  bucket 119 93  bucket 120 44  bucket 121 16  bucket 122 4  bucket 123 1  bucket 124 0  bucket 125 0  bucket 126 0  bucket 127 0  bucket 128 0 | bucket 1 0  bucket 2 0  bucket 3 0  bucket 4 0  bucket 5 0  bucket 6 0  bucket 7 0  bucket 8 0  bucket 9 0  bucket 10 0  bucket 11 0  bucket 12 0  bucket 13 44  bucket 14 247  bucket 15 141  bucket 16 134  bucket 17 110  bucket 18 113  bucket 19 88  bucket 20 77  bucket 21 81  bucket 22 90  bucket 23 64  bucket 24 134  bucket 25 258  bucket 26 398  bucket 27 462  bucket 28 673  bucket 29 632  bucket 30 534  bucket 31 540  bucket 32 645  bucket 33 650  bucket 34 722  bucket 35 689  bucket 36 542  bucket 37 624  bucket 38 609  bucket 39 538  bucket 40 567  bucket 41 622  bucket 42 596  bucket 43 585  bucket 44 723  bucket 45 755  bucket 46 802  bucket 47 1460  bucket 48 2202  bucket 49 2813  bucket 50 3370  bucket 51 3212  bucket 52 4538  bucket 53 4117  bucket 54 4410  bucket 55 4137  bucket 56 2699  bucket 57 2472  bucket 58 2083  bucket 59 1866  bucket 60 2020  bucket 61 1690  bucket 62 1611  bucket 63 1641  bucket 64 1487  bucket 65 1380  bucket 66 1453  bucket 67 1409  bucket 68 1440  bucket 69 1352  bucket 70 1292  bucket 71 1346  bucket 72 1373  bucket 73 1379  bucket 74 1360  bucket 75 1388  bucket 76 1233  bucket 77 1489  bucket 78 1527  bucket 79 1500  bucket 80 1670  bucket 81 1626  bucket 82 1739  bucket 83 1644  bucket 84 1773  bucket 85 1629  bucket 86 1704  bucket 87 1911  bucket 88 1896  bucket 89 1892  bucket 90 2236  bucket 91 2368  bucket 92 2232  bucket 93 1929  bucket 94 1361  bucket 95 1266  bucket 96 1613  bucket 97 2111  bucket 98 1931  bucket 99 1781  bucket 100 1646  bucket 101 1599  bucket 102 1377  bucket 103 1374  bucket 104 1301  bucket 105 948  bucket 106 719  bucket 107 662  bucket 108 577  bucket 109 501  bucket 110 582  bucket 111 524  bucket 112 549  bucket 113 514  bucket 114 460  bucket 115 378  bucket 116 356  bucket 117 402  bucket 118 340  bucket 119 281  bucket 120 256  bucket 121 171  bucket 122 88  bucket 123 13  bucket 124 0  bucket 125 0  bucket 126 0  bucket 127 0  bucket 128 0 | bucket 1 249  bucket 2 367  bucket 3 506  bucket 4 714  bucket 5 922  bucket 6 1121  bucket 7 1334  bucket 8 1759  bucket 9 2139  bucket 10 2576  bucket 11 3032  bucket 12 3614  bucket 13 3797  bucket 14 4045  bucket 15 4069  bucket 16 4237  bucket 17 4254  bucket 18 4095  bucket 19 4090  bucket 20 3804  bucket 21 3662  bucket 22 3507  bucket 23 3342  bucket 24 3138  bucket 25 2958  bucket 26 2725  bucket 27 2566  bucket 28 2407  bucket 29 2223  bucket 30 2093  bucket 31 1972  bucket 32 1849  bucket 33 1720  bucket 34 1521  bucket 35 1465  bucket 36 1350  bucket 37 1335  bucket 38 1221  bucket 39 1153  bucket 40 1150  bucket 41 1082  bucket 42 991  bucket 43 972  bucket 44 1001  bucket 45 983  bucket 46 815  bucket 47 798  bucket 48 783  bucket 49 766  bucket 50 744  bucket 51 690  bucket 52 726  bucket 53 676  bucket 54 742  bucket 55 749  bucket 56 804  bucket 57 869  bucket 58 821  bucket 59 835  bucket 60 785  bucket 61 787  bucket 62 1239  bucket 63 1985  bucket 64 2220  bucket 65 1979  bucket 66 2066  bucket 67 1961  bucket 68 1203  bucket 69 828  bucket 70 631  bucket 71 516  bucket 72 509  bucket 73 406  bucket 74 365  bucket 75 327  bucket 76 263  bucket 77 265  bucket 78 225  bucket 79 196  bucket 80 200  bucket 81 175  bucket 82 184  bucket 83 161  bucket 84 150  bucket 85 155  bucket 86 128  bucket 87 147  bucket 88 150  bucket 89 154  bucket 90 118  bucket 91 138  bucket 92 149  bucket 93 133  bucket 94 145  bucket 95 134  bucket 96 135  bucket 97 125  bucket 98 121  bucket 99 118  bucket 100 132  bucket 101 116  bucket 102 131  bucket 103 96  bucket 104 126  bucket 105 117  bucket 106 127  bucket 107 122  bucket 108 122  bucket 109 140  bucket 110 144  bucket 111 164  bucket 112 182  bucket 113 210  bucket 114 232  bucket 115 235  bucket 116 266  bucket 117 227  bucket 118 215  bucket 119 132  bucket 120 115  bucket 121 91  bucket 122 42  bucket 123 33  bucket 124 21  bucket 125 11  bucket 126 7  bucket 127 5  bucket 128 3 |

**Bucket Size of 40:**

|  |  |  |
| --- | --- | --- |
| **Matrices I1** | **Matrices I2** | **Matrices I3** |
| bucket 1 0  bucket 2 357  bucket 3 47236  bucket 4 28938  bucket 5 32324  bucket 6 26292  bucket 7 21 | bucket 1 954  bucket 2 9452  bucket 3 45482  bucket 4 29020  bucket 5 36288  bucket 6 13700  bucket 7 272 | bucket 1 50724  bucket 2 43357  bucket 3 16632  bucket 4 18171  bucket 5 2852  bucket 6 3219  bucket 7 213 |

**Bucket Size of 80:**

|  |  |  |
| --- | --- | --- |
| **Matrices I1** | **Matrices I2** | **Matrices I3** |
| bucket 1 357  bucket 2 76174  bucket 3 58616  bucket 4 21 | bucket 1 10406  bucket 2 74502  bucket 3 49988  bucket 4 272 | bucket 1 94081  bucket 2 34803  bucket 3 6071  bucket 4 213 |

**Bucket Size of 200:**

|  |  |  |
| --- | --- | --- |
| **Matrices I1** | **Matrices I2** | **Matrices I3** |
| bucket 1 108855  bucket 2 26313 | bucket 1 121196  bucket 2 13972 | bucket 1 131736  bucket 2 3432 |

When above examples analyzed we can clearly see that if bucket size is increased related to that, frequency also becomes larger. If we look at the bucket size of 2 we can see that in image 1 frequency distribution is smaller comparing to image 2 and image 3. But in bigger bucket sizes frequency of image 1 is higher then image 2 and image 3. If we again analyzed that frequency distribution in image 1 and image 2 are somehow similar while image 3 is completely different. In image 3 bucket size of 2 we can see that frequency are higher but if we apply bigger bucket size frequency becomes smaller. Even if we look to the image without any data processing method we can see that image 3 is different and less brighter then other two images.

3. Histogram can be used as a data reduction method, if we view a 3D image as a 2D image that causes to data reduction and again if we use that 2D image in to a histogram that’s also a data reduction method. In our case, images I4, I5 and I6 are all 2D images of plane from different angles. Histogram uses pixels of the program which means it is also use colors , in image I4 and image I5 we can see wings of the planes that means histogram of this two images in same or similar bucket size would be close to each other. Even though plane’s angles are in different rotation in three images , plane’s size and color is similar , histogram should not be an effective method in our case.