# [doClustering.py 실행결과]

standardize the values
```
[[0.97300221 0.64714278 0.9705053  0.93529984 0.97698802]
 [0.61016612 0.43953315 0.63315906 0.6075746  0.64603333]
 [0.87280448 0.62745227 0.86083479 0.77608306 0.84378459]
 [0.44759255 0.20430627 0.37613087 0.29864695 0.32917623]
 [0.53687785 0.51561472 0.48973774 0.50173207 0.37771844]
 [0.19642479 0.1765125  0.12663699 0.08963737 0.08846343]
 [0.42848756 0.27206904 0.42200805 0.33756472 0.36816866]
 [0.18602774 0.049999   0.08162296 0.01204594 0.08189237]
 [0.41313598 0.40392472 0.4982597  0.50610404 0.50872971]
 [0.94461674 0.68969277 0.97102431 0.94583989 0.97416494]
 [0.57640293 0.40182388 0.44414147 0.40936257 0.44504437]
 [0.         0.05075804 0.01150278 0.         0.        ]
 [0.60349131 0.49725036 0.64403867 0.60742886 0.62365792]
 [0.67099031 0.48682623 0.58768529 0.54661997 0.59243674]
 [0.74873346 0.64510343 0.78396936 0.7876109  0.7895508 ]
 [0.98038874 0.7722816  1.         1.         1.        ]
 [0.90939892 0.70764365 0.90482614 0.8966419  0.90423339]
 [0.28493619 0.24481996 0.30725584 0.28854284 0.30884613]
 [0.82444058 1.         0.88148452 0.93600117 0.92133954]
 [0.31865555 0.28584539 0.36504645 0.35480793 0.369962  ]
 [0.31173582 0.33753177 0.32959249 0.36870506 0.32921704]
 [0.25565735 0.21455437 0.26024571 0.23885586 0.26338135]
 [0.24607052 0.17075673 0.26880425 0.2617179  0.26419438]
 [0.18079809 0.08172007 0.18942686 0.20232683 0.23269245]
 [0.1482719  0.1198938  0.0889662  0.08110482 0.09117554]
 [0.1972352  0.14927771 0.16940417 0.167749   0.15229423]
 [0.36888256 0.36396333 0.34329655 0.38469527 0.35351631]
 [0.12006792 0.         0.         0.06498498 0.10841471]
 [0.45969083 0.33610441 0.44439166 0.34536583 0.44005727]
 [0.30531678 0.2291621  0.38090713 0.51790789 0.48992833]
 [0.67309025 0.50954866 0.72020256 0.75007846 0.72754927]
```

```
[0.76843893 0.41249177 0.61217218 0.64731444 0.65824316]
[0.72984541 0.34374314 0.77541809 0.45320462 0.63954152]
[0.53687785 0.20624589 0.30608609 0.21056734 0.18135113]
[1.         0.61873766 0.85704105 0.55025953 0.826558  ]
[0.62950228 0.61873766 0.71011973 0.76378033 0.7255691 ]
[0.66078334 0.52827894 0.67607436 0.62432775 0.65233738]
[0.70668931 0.51431086 0.73052547 0.70220066 0.72263487]
[0.68312695 0.58617252 0.67016744 0.60134106 0.63609647]
[0.77061066 0.63164918 0.87050453 0.87806163 0.87609873]
[0.7022472  0.60796508 0.70205045 0.66279898 0.70997906]
[0.32200698 0.28629968 0.36932972 0.37278325 0.37346489]
[0.31882648 0.27675369 0.33735261 0.34601706 0.34085112]
[0.52669934 0.39889314 0.58795438 0.53852761 0.5546648 ]
[0.44771353 0.34729911 0.48481222 0.44149109 0.47219401]
[0.28342966 0.26690644 0.3272305  0.33609462 0.33010399]
[0.76843893 0.41249177 0.65298366 0.45320462 0.52733163]
[0.11427889 0.07218606 0.         0.02131027 0.06914124]
[0.36695809 0.29383442 0.41707546 0.38510996 0.41323845]]

KMeans variable
[[0.14288807 0.0875434  0.08344499 0.0798949  0.10300925]
 [0.77289553 0.58557398 0.77213271 0.72027011 0.76067278]
 [0.38779772 0.30283545 0.38798294 0.37222999 0.37569043]]


merge the scale, predicted clustering, and beer name
```

merge the scale, predicted clustering, and beer name

| | Aroma | Appearance | ... | 맥주이름 | Cluster |
|---|---|---|---|---|---|
| 0 | 0.973002 | 0.647143 | ... | Goose Island Goose IPA | 1 |
| 1 | 0.610166 | 0.439533 | ... | Goose Island 312 Urban Wheat Ale | 1 |
| 2 | 0.872804 | 0.627452 | ... | Edelweiss Weissbier Hefetrüb | 1 |
| 3 | 0.447593 | 0.204306 | ... | Somersby Apple Cider | 2 |
| 4 | 0.536878 | 0.515615 | ... | Apple Fox | 2 |
| 5 | 0.196425 | 0.176512 | ... | Desperados | 0 |
| 6 | 0.428488 | 0.272069 | ... | Egger Grapefruit Radler | 2 |
| 7 | 0.186028 | 0.049999 | ... | Egger Radler | 0 |
| 8 | 0.413136 | 0.403925 | ... | Stella Artois | 2 |
| 9 | 0.944617 | 0.689693 | ... | Hoegaarden | 1 |
| 10 | 0.576403 | 0.401824 | ... | Hoegaarden Rosée | 2 |
| 11 | 0.000000 | 0.050758 | ... | Budweiser | 0 |

| 12 | 0.603491 | 0.497250 | ... | Patagonia Bohemian Pilsener | 1 |
|---|---|---|---|---|---|
| 13 | 0.670990 | 0.486826 | ... | Kronenbourg 1664 Blanc | 1 |
| 14 | 0.748733 | 0.645103 | ... | Erdinger Weissbier | 1 |
| 15 | 0.980389 | 0.772282 | ... | Paulaner Hefe-Weissbier | 1 |
| 16 | 0.909399 | 0.707644 | ... | Paulaner Hefeweissbier Dunkel | 1 |
| 17 | 0.284936 | 0.244820 | ... | Tiger Beer | 2 |
| 18 | 0.824441 | 1.000000 | ... | Guinness Draught | 1 |
| 19 | 0.318656 | 0.285845 | ... | Carlsberg Pilsner | 2 |
| 20 | 0.311736 | 0.337532 | ... | Heineken | 2 |
| 21 | 0.255657 | 0.214554 | ... | San Miguel Pale Pilsen | 2 |
| 22 | 0.246071 | 0.170757 | ... | Tsingtao | 2 |
| 23 | 0.180798 | 0.081720 | ... | Tsingtao Draft Beer 11º (Pure Draft Beer) | 0 |
| 24 | 0.148272 | 0.119894 | ... | Cass Fresh | 0 |
| 25 | 0.197235 | 0.149278 | ... | Hite Beer | 0 |
| 26 | 0.368883 | 0.363963 | ... | Kloud Original Gravity | 2 |
| 27 | 0.120068 | 0.000000 | ... | Terra | 0 |
| 28 | 0.459691 | 0.336104 | ... | Max Cream | 2 |
| 29 | 0.305317 | 0.229162 | ... | FiLite | 2 |
| 30 | 0.673090 | 0.509549 | ... | Jeju Wit Ale | 1 |
| 31 | 0.768439 | 0.412492 | ... | Jeju Pellong Ale | 1 |
| 32 | 0.729845 | 0.343743 | ... | Jeju Baengnokdam Ale | 1 |
| 33 | 0.536878 | 0.206246 | ... | HiteJinro Isul Tok Tok | 2 |
| 34 | 1.000000 | 0.618738 | ... | Kabrew Gyeongbokgung Royal Pride IPA | 1 |
| 35 | 0.629502 | 0.618738 | ... | ARK Seoulite Ale | 1 |
| 36 | 0.660783 | 0.528279 | ... | Hop House 13 Lager | 1 |
| 37 | 0.706689 | 0.514311 | ... | Blue Moon Belgian White | 1 |
| 38 | 0.683127 | 0.586173 | ... | Volfas Engelman Pasaulio Skoniai IPA | 1 |
| 39 | 0.770611 | 0.631649 | ... | Pilsner Urquell | 1 |
| 40 | 0.702247 | 0.607965 | ... | Kozel Černý (Dark) 10° | 1 |
| 41 | 0.322007 | 0.286300 | ... | Sapporo Premium Beer / Draft Beer | 2 |
| 42 | 0.318826 | 0.276754 | ... | Kirin Ichiban | 2 |
| 43 | 0.526699 | 0.398893 | ... | Suntory The Premium Malt's | 2 |
| 44 | 0.447714 | 0.347299 | ... | Sapporo Yebisu | 2 |
| 45 | 0.283430 | 0.266906 | ... | Asahi Super Dry | 2 |
| 46 | 0.768439 | 0.412492 | ... | Kabrew Kumiho Peach Ale | 1 |
| 47 | 0.114279 | 0.072186 | ... | Cafri | 0 |
| 48 | 0.366958 | 0.293834 | ... | Beck's | 2 |

[49 rows x 7 columns]

properties of each cluster

|   | Aroma | Appearance | Flavor | Mouthfeel | Overall |
|---|---|---|---|---|---|
| 0 | 0.142888 | 0.087543 | 0.083445 | 0.079895 | 0.103009 |
| 2 | 0.387798 | 0.302835 | 0.387983 | 0.372230 | 0.375690 |
| 1 | 0.772896 | 0.585574 | 0.772133 | 0.720270 | 0.760673 |