# 영상처리 실제 - 14주차 과제

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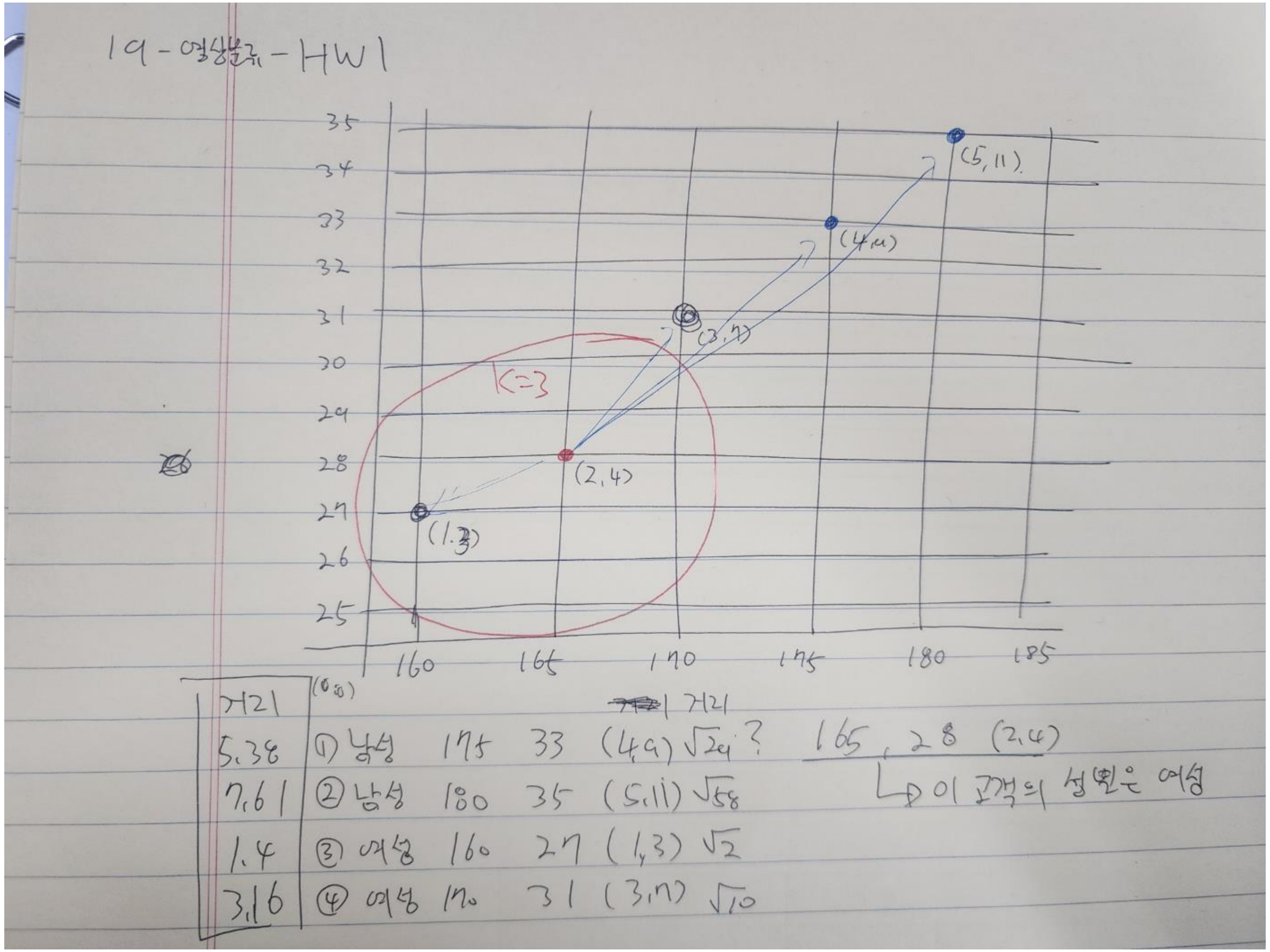
: 19 – 영상분류 – HW1


35
34
33
32
31
30
29
28
27
26
25
160
165
170
175
180
185
(0,0)
(5,11)
(4,11)
(3,7)
K=3
(2,4)
(1,3)

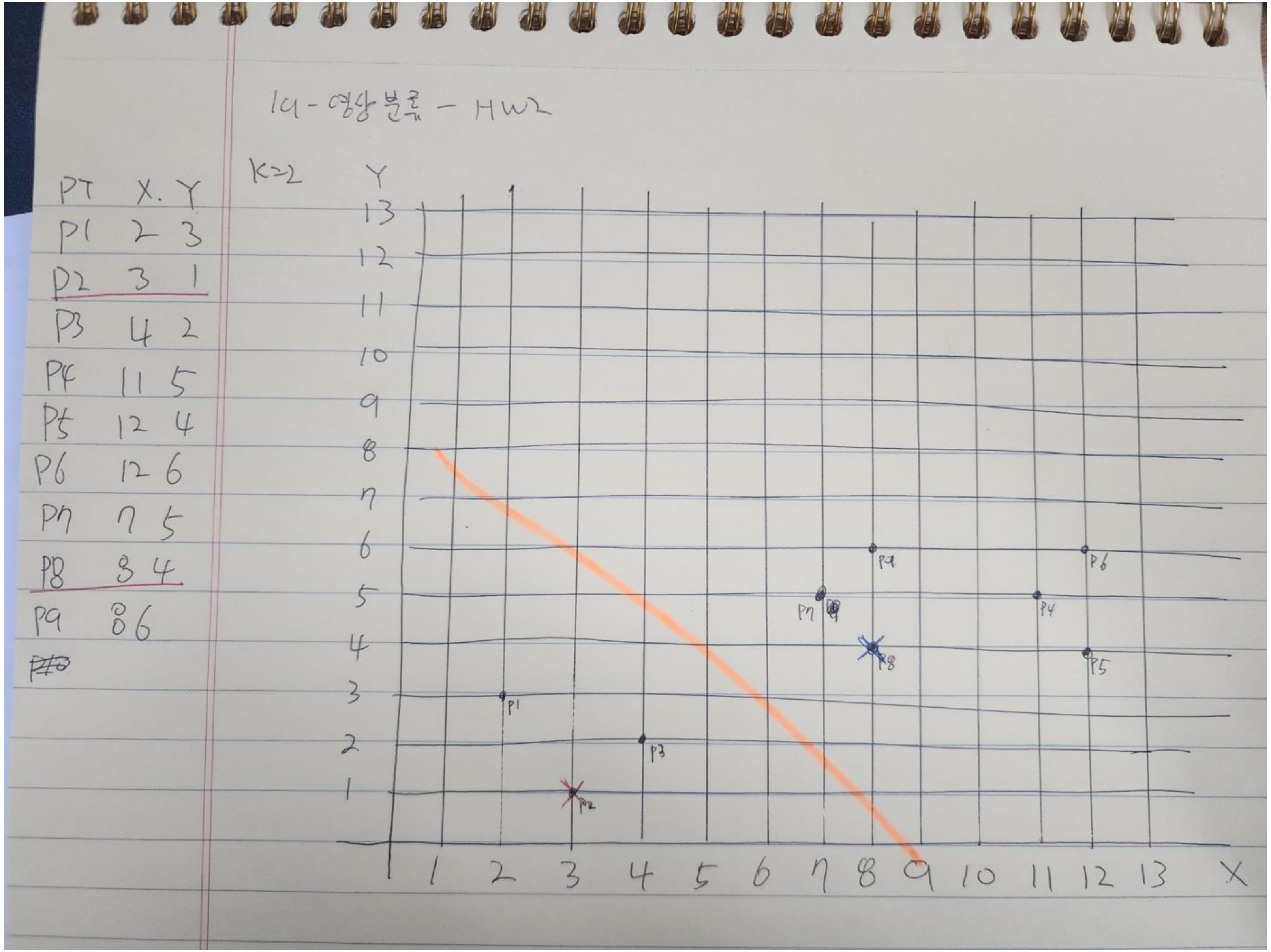
19-영상분류-HW1

| 거리 | | | | | 거리 |
|---|---|---|---|---|---|
| 5.38 | ① 남성 | 175 | 33 | (4,9) | $\sqrt{24}$ ? |
| 7.61 | ② 남성 | 180 | 35 | (5,11) | $\sqrt{58}$ |
| 1.4 | ③ 여성 | 160 | 27 | (1,3) | $\sqrt{2}$ |
| 3.16 | ④ 여성 | 170 | 31 | (3,7) | $\sqrt{10}$ |

165, 28 (2,4)

↳ 이 고객의 성별은 여성

: 19 – 영상분류 – HW2



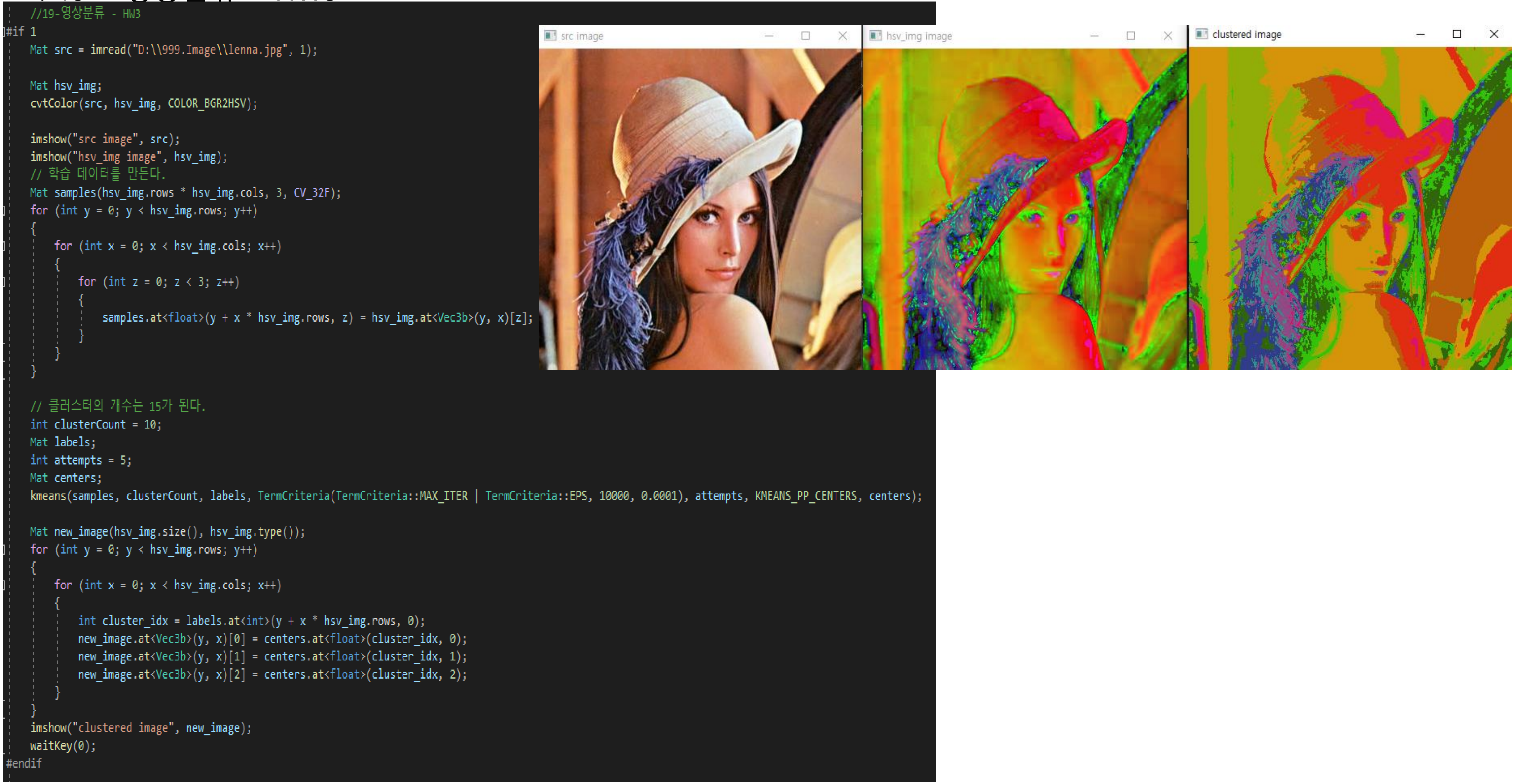
19 - 영상분류 - HW2

K=2

| PT | X. | Y |
|---|---|---|
| P1 | 2 | 3 |
| P2 | 3 | 1 |
| P3 | 4 | 2 |
| P4 | 11 | 5 |
| P5 | 12 | 4 |
| P6 | 12 | 6 |
| P7 | 7 | 5 |
| P8 | 8 | 4 |
| P9 | 8 | 6 |

~~P10~~

## : 19 – 영상분류 – HW3



```
    //19-영상분류 - HW3
#if 1
    Mat src = imread("D:\\999.Image\\lenna.jpg", 1);

    Mat hsv_img;
    cvtColor(src, hsv_img, COLOR_BGR2HSV);

    imshow("src image", src);
    imshow("hsv_img image", hsv_img);
    // 학습 데이터를 만든다.
    Mat samples(hsv_img.rows * hsv_img.cols, 3, CV_32F);
    for (int y = 0; y < hsv_img.rows; y++)
    {
        for (int x = 0; x < hsv_img.cols; x++)
        {
            for (int z = 0; z < 3; z++)
            {
                samples.at<float>(y + x * hsv_img.rows, z) = hsv_img.at<Vec3b>(y, x)[z];
            }
        }
    }

    // 클러스터의 개수는 15가 된다.
    int clusterCount = 10;
    Mat labels;
    int attempts = 5;
    Mat centers;
    kmeans(samples, clusterCount, labels, TermCriteria(TermCriteria::MAX_ITER | TermCriteria::EPS, 10000, 0.0001), attempts, KMEANS_PP_CENTERS, centers);

    Mat new_image(hsv_img.size(), hsv_img.type());
    for (int y = 0; y < hsv_img.rows; y++)
    {
        for (int x = 0; x < hsv_img.cols; x++)
        {
            int cluster_idx = labels.at<int>(y + x * hsv_img.rows, 0);
            new_image.at<Vec3b>(y, x)[0] = centers.at<float>(cluster_idx, 0);
            new_image.at<Vec3b>(y, x)[1] = centers.at<float>(cluster_idx, 1);
            new_image.at<Vec3b>(y, x)[2] = centers.at<float>(cluster_idx, 2);
        }
    }
    imshow("clustered image", new_image);
    waitKey(0);
#endif
```