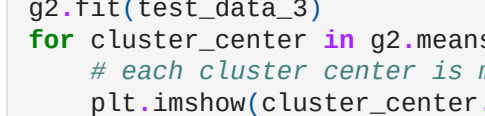
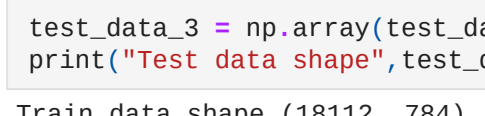
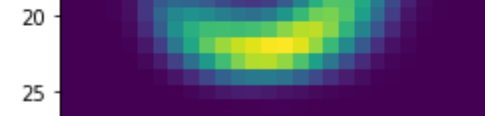


```
for p in range(1, 10):
    ci = np.random.randn(1000)
    plt.scatter(x, ci)
plt.show()
```

```
for i in range(len(info_f)
    # each cluster center
```

(784,)

(784,)




```
merged clusters : 29 31
iteration no : 24
merged clusters : 25
merged clusters : 53 67
iteration no : 25
merged clusters : 29 32
iteration no : 30
merged clusters : 29 41
iteration no : 27
merged clusters : 40 29
iteration no : 28
merged clusters : 26 40
iteration no : 29
merged clusters : 57 63
iteration no : 38
merged clusters : 33 46
iteration no : 31
merged clusters : 56 59
iteration no : 32
merged clusters : 39 25
iteration no : 33
merged clusters : 39 42
iteration no : 34
merged clusters : 39 37
iteration no : 35
merged clusters : 33 39
iteration no : 36
merged clusters : 59 64
iteration no : 37
merged clusters : 33 43
iteration no : 38
merged clusters : 3 13
iteration no : 39
merged clusters : 57 66
iteration no : 40
merged clusters : 1 2
iteration no : 41
merged clusters : 56 74
iteration no : 42
merged clusters : 84 72
iteration no : 43
merged clusters : 5 9
iteration no : 44
merged clusters : 6 21
iteration no : 45
merged clusters : 11 24
iteration no : 46
merged clusters : 3 19
iteration no : 47
merged clusters : 8 13
iteration no : 48
merged clusters : 4 11
iteration no : 49
merged clusters : 7 7 23
iteration no : 58
merged clusters : 51 69
iteration no : 51
merged clusters : 12 26
iteration no : 52
merged clusters : 3 4
iteration no : 53
merged clusters : 5 15
iteration no : 54
merged clusters : 69 64
iteration no : 55
merged clusters : 12 14
iteration no : 56
merged clusters : 6 12
iteration no : 57
merged clusters : 1 7
iteration no : 58
merged clusters : 6 69
iteration no : 59
merged clusters : 53 56
iteration no : 68
merged clusters : 30 6
iteration no : 61
merged clusters : 58 66
iteration no : 62
merged clusters : 8 1
iteration no : 63
merged clusters : 58 57
iteration no : 64
merged clusters : 5 59
iteration no : 65
merged clusters : 8 51
iteration no : 66
merged clusters : 5 55
iteration no : 67
merged clusters : 8 62
iteration no : 68
merged clusters : 8 5
iteration no : 69
merged clusters : 8 53
iteration no : 78
merged clusters : 8 33
iteration no : 71
merged clusters : 58 61
iteration no : 72
merged clusters : 8 52
iteration no : 73
merged clusters : 58 0
```

