

## EX 10

CODING:

```
import math

X = [1, 2, 3, 8, 9, 10]
mu1, mu2 = 2, 9
sigma1 = sigma2 = 1
pi1 = pi2 = 0.5

def gauss(x, mu, sigma):
    return math.exp(-(x-mu)**2/(2*sigma**2)) / (sigma*math.sqrt(2*math.pi))

for _ in range(10):
    r1 = [pi1*gauss(x,mu1,sigma1) for x in X]
    r2 = [pi2*gauss(x,mu2,sigma2) for x in X]
    s = [r1[i]+r2[i] for i in range(len(X))]
    r1 = [r1[i]/s[i] for i in range(len(X))]
    r2 = [r2[i]/s[i] for i in range(len(X))]

    mu1 = sum(r1[i]*X[i] for i in range(len(X))) / sum(r1)
    mu2 = sum(r2[i]*X[i] for i in range(len(X))) / sum(r2)
    pi1 = sum(r1)/len(X)
    pi2 = sum(r2)/len(X)

print("Cluster Means:", mu1, mu2)
```

## OUTPUT:

Programiz Python Online Compiler

Programiz PRO >

moin.pyRunOutputClear

```
1 import math
2
3 X = [1, 2, 3, 8, 9, 10]
4 mu1, mu2 = 2, 9
5 sigma1 = sigma2 = 1
6 p11 = p12 = 0.5
7
8 def gauss(x, mu, sigma):
9     return math.exp(-(x-mu)**2/(2*sigma**2)) / (sigma*math.sqrt(2*math.pi))
10
11 for _ in range(10):
12
13     r1 = [p11*gauss(x,mu1,sigma1) for x in X]
14     r2 = [p12*gauss(x,mu2,sigma2) for x in X]
15     s = [r1[i]+r2[i] for i in range(len(X))]
16     r1 = [r1[i]/s[i] for i in range(len(X))]
17     r2 = [r2[i]/s[i] for i in range(len(X))]
18
19     mu1 = sum(r1[i]*X[i] for i in range(len(X))) / sum(r1)
20     mu2 = sum(r2[i]*X[i] for i in range(len(X))) / sum(r2)
21     p11 = sum(r1)/len(X)
22     p12 = sum(r2)/len(X)
23
24
25 print("Cluster Means:", mu1, mu2)
26
```

Cluster Means: 2.000000419034833 8.99999958096515  
== Code Execution Successful ==