

## 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

main.py

Share

Run

```
1 import math
2
3 X = [1, 2, 3, 8, 9, 10]
4 mu1, mu2 = 2, 9
5 sigma1 = sigma2 = 1
6 pi1 = pi2 = 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 = [pi1*gauss(x,mu1,sigma1) for x in X]
14     r2 = [pi2*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
20 mu1 = sum(r1[i]*X[i] for i in range(len(X))) / sum(r1)
21 mu2 = sum(r2[i]*X[i] for i in range(len(X))) / sum(r2)
22 pi1 = sum(r1)/len(X)
23 pi2 = sum(r2)/len(X)
24
25 print("Cluster Means:", mu1, mu2)
26
```

Output

Clear

Cluster Means: 2.0000000419034833 8.999999958096515

=== Code Execution Successful ===