## Confusion Matrix

For Kmeans++ with cosine similarity

```
cluster0 : C1/article01  C1/article02  C1/article03  C1/article04  C1/article05  C1/article06  C1/article07  C1/article08
cluster1 : C4/article01  C4/article02  C4/article03  C4/article04  C4/article05  C4/article06  C4/article07  C4/article08
cluster2 : C7/article01  C7/article02  C7/article03  C7/article04  C7/article05  C7/article06  C7/article07  C7/article08
```

| N=24 | Predicted Cluster 0 | Predicted Cluster 1 | Predicted Cluster 2 | |
|---|---|---|---|---|
| Actually Cluster 0 | 8 | 0 | 0 | TC0= 8 |
| Actually Cluster 1 | 0 | 8 | 0 | TC1= 8 |
| Actually Cluster 2 | 0 | 0 | 8 | TC2= 8 |
| | TP0= 8 | TP1= 8 | TP2= 8 | |

**Recall =TPi/(TPi+FNi) = TruePositive(i)/Actual size of cluster i**
**Precision =TPi/(TPi+FPi) = TruePositive(i)/Total predicted as i**
Recall 0 = 8/8 =1 Precision 0 = 8/8 =1
Recall 1 =8/8 = 1 Precision 1=8/8 =1
Recall 2 =8/8 = 1 Precision 2=8/8 =1

Average Recall = 1 Average Precision =1
F-measure = 2PR/(P+R) =1

For Kmeans with cosine similarity

```
cluster0 : C1/article01  C1/article02  C1/article03  C1/article04  C1/article05  C1/article07  C7/article01  C7/article02  C7/article03  C7/article07
C7/article08
cluster1 : C1/article06  C1/article08  C7/article04  C7/article05  C7/article06
cluster2 : C4/article01  C4/article02  C4/article03  C4/article04  C4/article05  C4/article06  C4/article07  C4/article08
```

| | Predicted Cluster 0 | Predicted Cluster 1 | Predicted Cluster 2 | |
|---|---|---|---|---|
| Actually Cluster 0 | 6 | 2 | 0 | TC0= 8 |
| Actually Cluster 1 | 5 | 3 | 0 | TC1= 8 |
| Actually Cluster 2 | 0 | 0 | 8 | TC2= 8 |
| | TP0= 11 | TP1= 5 | TP2= 8 | |

**Recall =TPi/(TPi+FNi) = TruePositive(i)/Actual size of cluster i**
**Precision =TPi/(TPi+FPi) = TruePositive(i)/Total predicted as i**
Recall 0 = 6/8 =0.75 Precision 0 = 6/11= 0.55
Recall 1 =3/8 = 0.37 Precision 1=3/5 =0.6
Recall 2 =8/8 = 1 Precision 2=8/8 =1

Average Recall = 0.71 Average Precision = 0.72
F-measure = 2PR/(P+R) = 0.715