

In a simple speaker identification system trained on three speakers, each speaker is represented by a 2-component Gaussian mixture Model (GMM) as follow:

Speaker S1: $Gmm_1(y_t) = 0.4g_{11}(y_t) + 0.6g_{12}(y_t)$

Speaker S2: $Gmm_2(y_t) = 0.8g_{21}(y_t) + 0.2g_{22}(y_t)$

Speaker S3: $Gmm_3(y_t) = 0.5g_{31}(y_t) + 0.5g_{32}(y_t)$

Where $g_{11}, g_{12}, g_{21}, g_{22}, g_{31}, g_{32}$ are all multivariate Gaussian PDFs and y_t is an acoustic vector. Let $Y = \{y_1, y_2, y_3\}$ be a sequence of acoustic feature vectors which represents a sample of speech of unknown speaker. The probability for each vector and each Gaussian PDF is given in the following table:

	g_{11}	g_{12}	g_{21}	g_{22}	g_{31}	g_{32}
y_1	0.03	0.07	0.02	0.04	0.01	0.08
y_2	0.02	0.06	0.04	0.03	0.07	0.04
y_3	0.03	0.06	0.03	0.07	0.03	0.02

Assuming the prior probability of speakers S1, S2, S3 are 0.15, 0.45 and 0.4 respectively. Use the given information and find the most probably speaker who has uttered test segment Y.

