Write a program implementing synthetic HMMs: a) The output of the HMM is the weather condition, which a traveler is experiencing, and b) The state of the HMM is the city, which the traveler is in.

The weather conditions are sunny, rainy, cloudy, and snow.

1. Generate multiple observation sequences from at least two different HMMs. i.e. for instance the cities {Glasgow, Copenhagen, Rome}, {Miami, New York, Aalborg}. Alternatively, you can choose the same cities, but with different transition probabilities (corresponding to different travel patterns for the travellers).
2. Implement the Viterbi algorithm and try to recognise the correct HMM for each observation sequence. Discuss reasons for misrecognition.