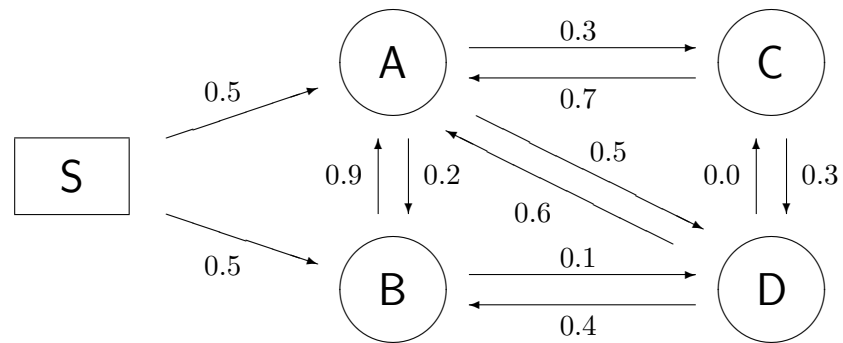


Algorithms in Genome Research
Winter 2005/2006

Exercises

Sheet 3, Discussion: 01.12.2005

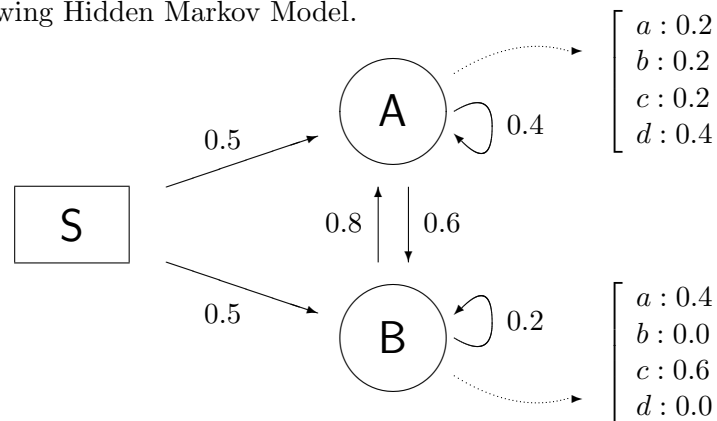
1. Given the following Markov chain.



What are the probabilities of the following paths through the chain:

- (a) SABDACDB
- (b) SBADBABA
- (c) SACDBDCA

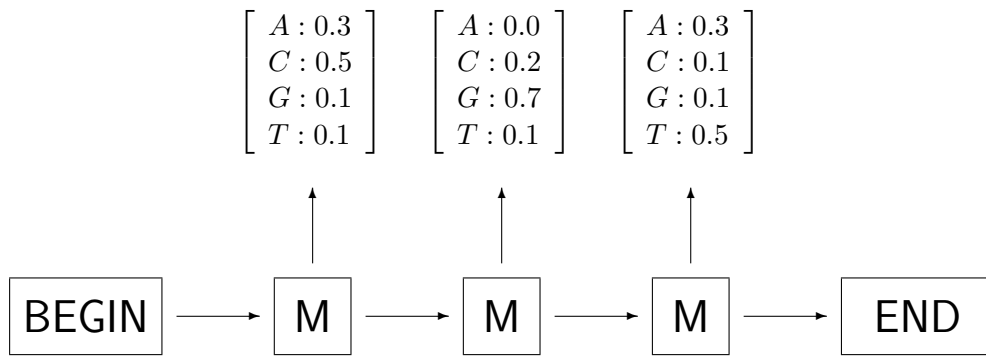
2. Given the following Hidden Markov Model.



What are the probabilities of the following emissions:

- (a) *a*
- (b) *aa*
- (c) *aaa*
- (d) *abcd*

3. Given following Profile HMM and sequence



Sequence: AGACCGATTT

- (a) Calculate the probability for each sequence position.
- (b) At which position is the profile most probable?
- (c) How could you enhance the model to find CGT and CGAT as a profile?