**\*\*\*\*\*\*\*\*\*draft (will finish tomorrow)**

**Input:** observations of length N, state set of length L

**Output:** best-path

create a path probability matrix viterbi[N, L + 2]

create a path backpointer matrix backpointer[N, L + 2]

**foreach** state s from 1 to L do

viterbi[1,s] ← trans(hSi,s) × emit(o1,s)

backpointer[1,s] ← 0

**end**

foreach time step i from 2 to N do

sub\_space = T(x\_i)

foreach t1 in sub\_space do:

foreach t2 in sub\_space do:

viterbi[i,t1,t2] ← max 0=1 viterbi[i − 1,:,t1 ] × trans(s 0 ,s) × emit(oi ,s)

backpointer[i,s] ← arg maxL s 0=1 viterbi[i − 1,s 0 ] × trans(s 0 ,s)

**end**

**end**

viterbi[N, L + 1] ← maxL s=1 viterbi[s, N] × trans(s,h/Si)

backpointer[N, L + 1] ← arg maxL s=1 viterbi[N,s] × trans(s,h/Si)

**return** the path by following backpointers from backpointer[N, L + 1]