|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Start | Moo | Hello | Quack | End |
|  | 0 | 1 | 2 | 3 | 4 |
| Start | 1.0 | 0 | 0 | 0 | 0 |
| Cow | 0 | 1\*.9 = .9 | .9\*.5\*.1 = .045  (from cow, moo)  | 0 | 0 |
| Duck | 0 | 0 |  .9\*.3\*.4 = .108 (from cow, moo) |  0.045\*.3\*.6=.0081 (from cow, hello)    .108\*.5\*.6=.0324 (from duck, hello) | 0 |
| End | 0 | 0 | 0 | 0 |  .0081\*.2=.00162 (from duck, quack)  .0324\*.2=.00648 (from duck, quack) |

Ans1.   
  
  
  
  
Most likely state transition is

**Start -> Cow -> Duck -> Duck -> End** with probability **.00648**

(b).

Another state transition emitting the same sentence will be

**Start -> Cow -> Cow -> Duck -> End** with probability **.00162**

**Total probability of emitting this sentence will be: .00648 + .00162 = .0081**

Ans2.

Correctly tagged sentence is “He is running”

Sentence: He is running

Annotate He == <constit cat="PRP">

Annotate is == <constit cat="VBZ">

Annotate running == <constit cat="VBG">

Here “He” = PRP

PRP :- Personal Pronoun

“is” = VBZ

VBZ = 3rd Person singular Present  
  
“running” = VBG  
VBG = Verb & present participle

(b).

Incorrectly tagged sentence is “I should go out and drink water”. Here drink is tagged as NN, whereas it is a VBP

Sentence: I should go out and drink water.

Annotate I == <constit cat="PRP">

Annotate should == <constit cat="MD">

Annotate go == <constit cat="VB">

Annotate out == <constit cat="RP">

Annotate and == <constit cat="CC">

Annotate drink == <constit cat="NN">

Annotate water == <constit cat="NN">

Annotate . == <constit cat=".">

STATE VBP : 14955

EMIT drink 5

Normalized drink: 0.00033

STATE NN : 159394

EMIT drink 7

Normalized drink: 7/159394 = 0.000043

STATE CC

Arc to NN: 3399

Arc to VBP: 344

P(drink being NN) = .000043\*3399 = .1492

P(drink being VBP) = 344\*.00033 = .11352

Hence here drink is being treated as NN, where as it should be treated as a VBP.