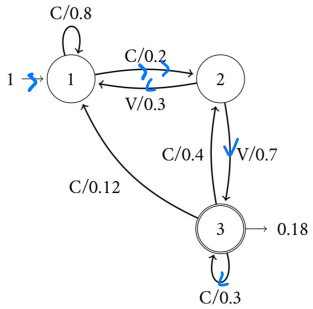
points



CVCVC

1. What probability does this probabilistic FSA assign to the string "CVCVC"? Use the "total weight" semiring from the lecture 6 handout. To get full points, show your work. 5 points

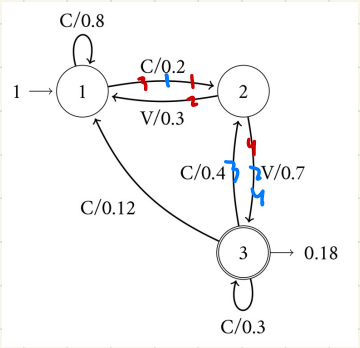
For "CVCVC" via path [1,2,3,2,3,3]:

$1 \times 0.2 \times 0.7 \times 0.4 \times 0.7 \times 0.3 \times 0.18 = 0.0021168$

For "CVCVC" via path [1,2,1,2,3,3]

$1 \times 0.2 \times 0.3 \times 0.2 \times 0.7 \times 0.3 \times 0.18 = 0.0004536$

$0.0021168 + 0.0004536 = \boxed{0.0025704}$

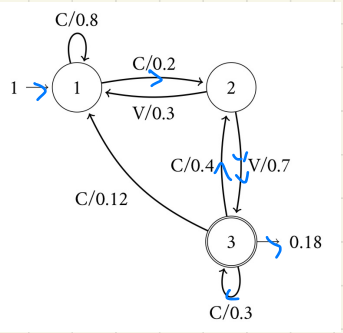


2. What probability does this probabilistic FSA assign to the string "CVCV"?

For "CVCV" via path [1,2,3,2,3]:
$1 \times 0.2 \times 0.7 \times 0.4 \times 0.7 \times 0.18 = 0.007056$

For "CVCV" via path [1,2,1,2,3]:
$1 \times 0.2 \times 0.3 \times 0.2 \times 0.7 \times 0.18 = 0.001512$

$0.007056 + 0.001512 = \boxed{0.008568}$



CVCVC

1, 2, 3, 2, 3, 3

3. What is the probability of the most likely sequence of states that could have generated "CVCVC"? What is this sequence of states? 10 points

For "CVCVC" via path [1,2,3,2,3,3]:

$1 \times 0.2 \times 0.7 \times 0.4 \times 0.7 \times 0.3 \times 0.18 = 0.0021168$

For "CVCVC" via path [1,2,1,2,3,3]

$1 \times 0.2 \times 0.3 \times 0.2 \times 0.7 \times 0.3 \times 0.18 = 0.0004536$

$\max(0.0021168, 0.0004536) =$ **0.0021168**

Path [1,2,3,2,3,3]