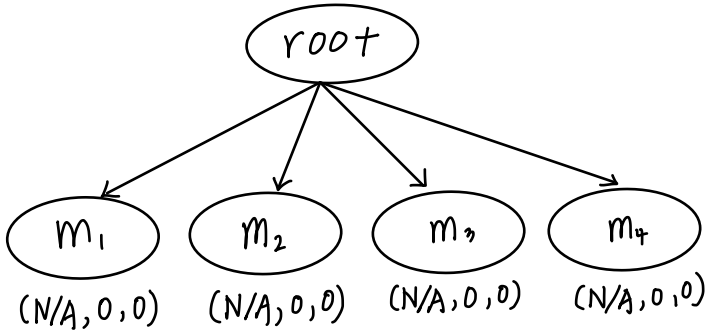
컴퓨터공학부 20181412I 이연희
MCTS Algorithm Homework

$UCT = \overline{X_j} + 2C_p\sqrt{\frac{2\ln n}{n_j}}$, $C = 1/2\sqrt{2}$

(X_j, n, n_j) – (Mean Value, Parent Visits, child Visits)

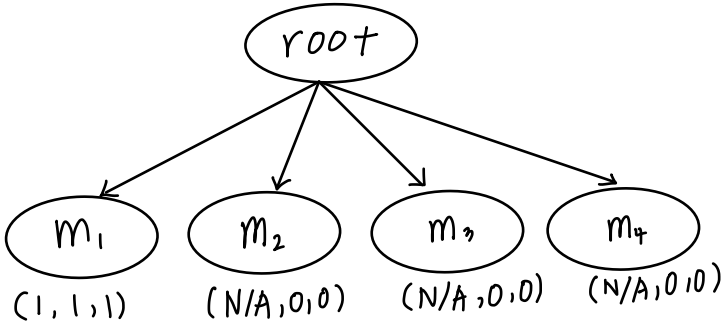
Partial tree



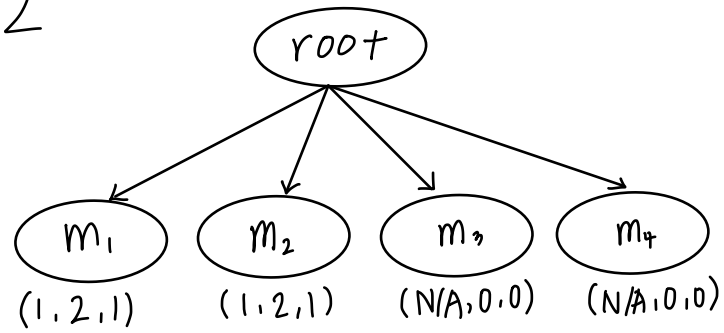
#1

$$UCT = \overline{X_j} + 2 \cdot \frac{1}{2\sqrt{2}}\sqrt{\frac{2\ln n}{0}} = \infty$$

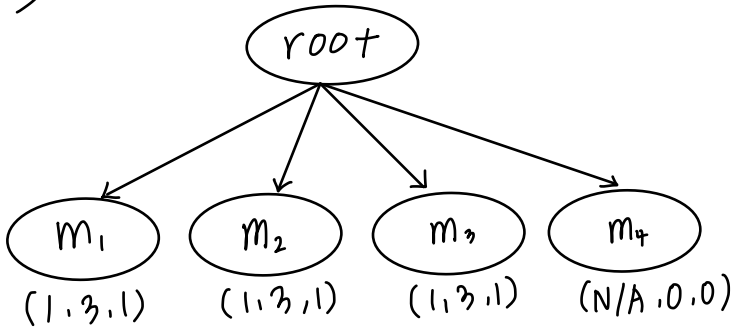
$\Rightarrow$ m_1, m_2, m_3, m_4의 UCT = ∞ 이므로 m_1 선택



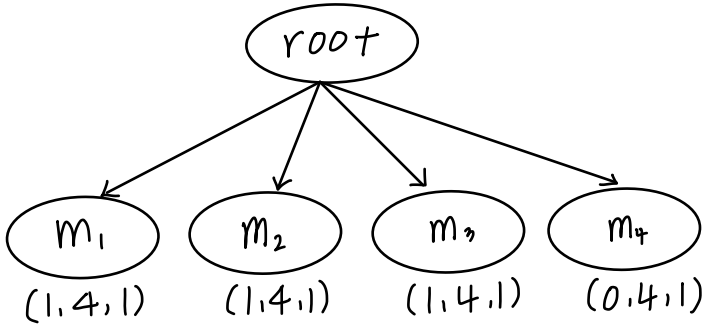
#2



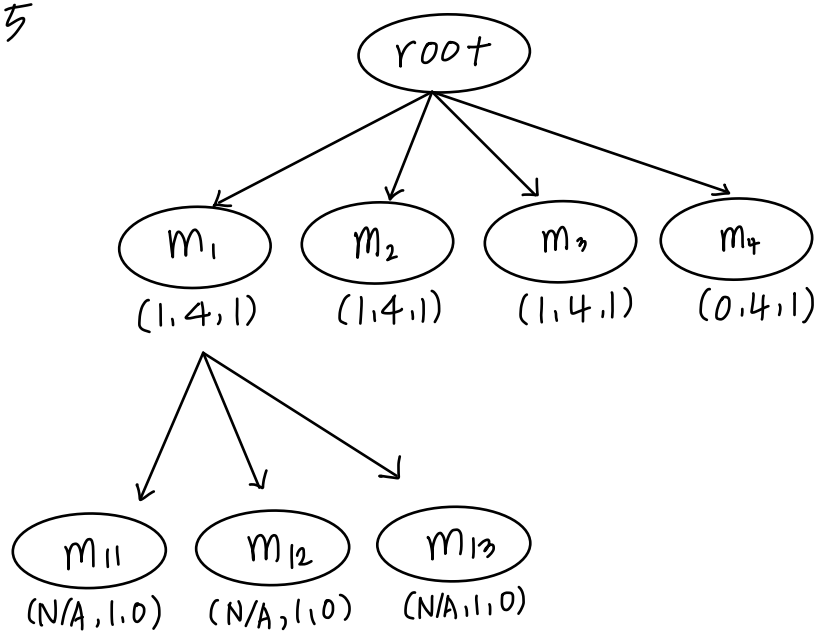
#3



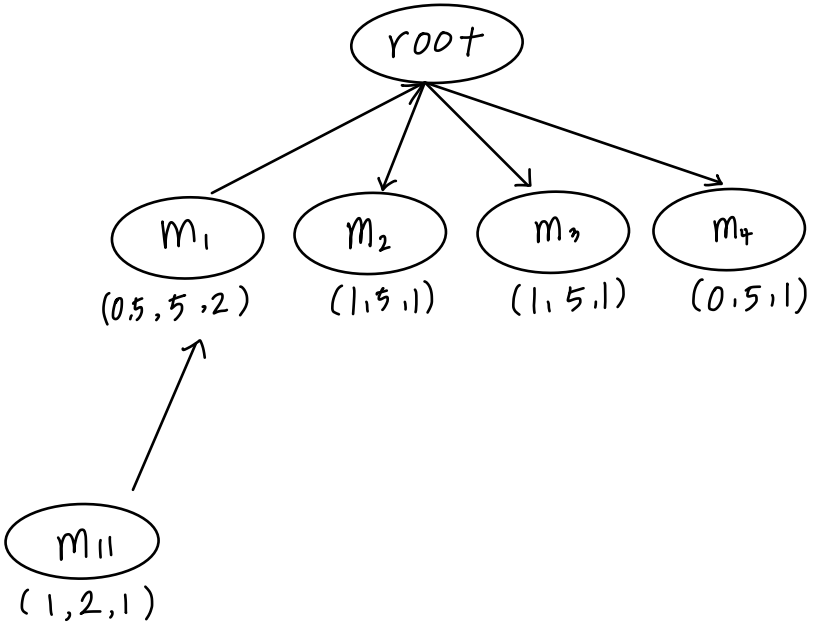
#4



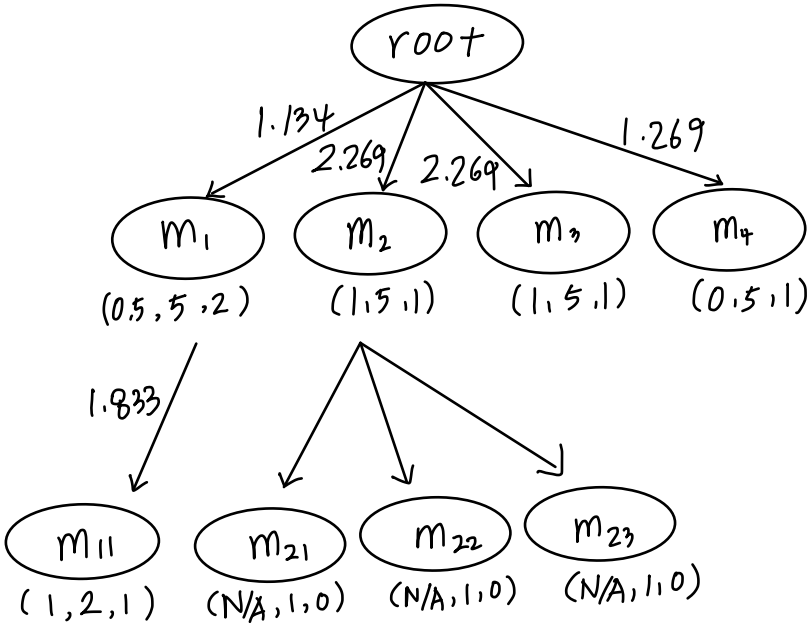
#5



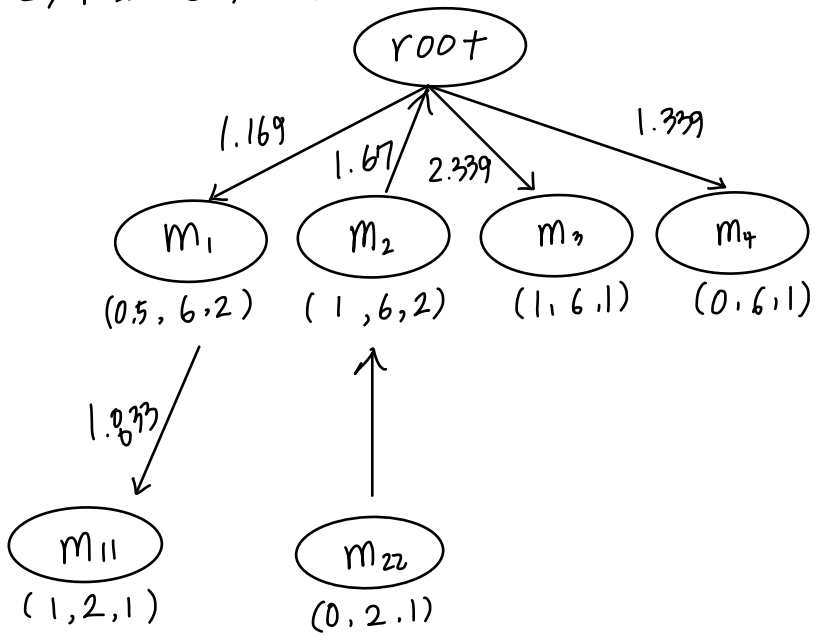
⇒ m_{11}, m_{12}, m_{13}의 UCT=∞ 이기 때문에 m_{11}을 선택



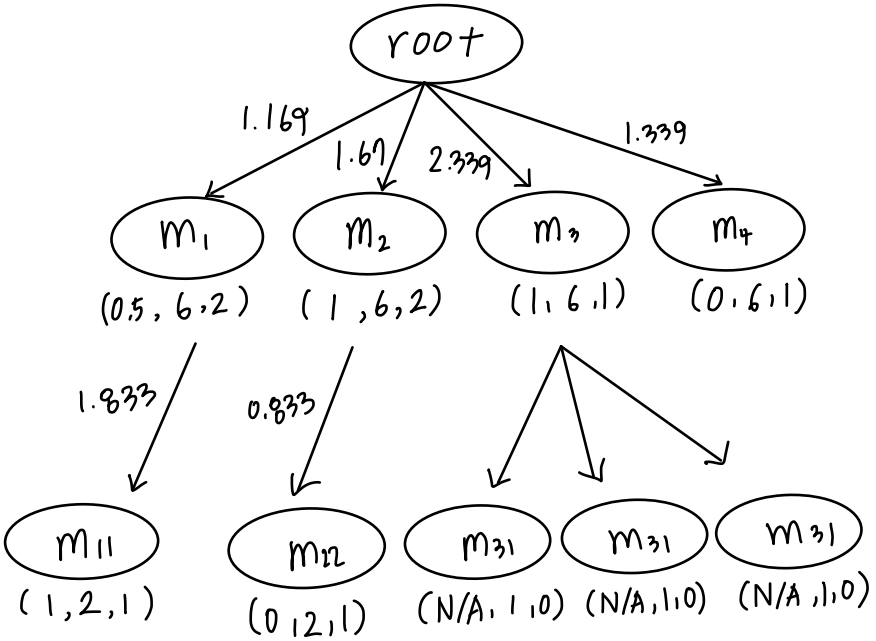
#6 ⇒ m_2와 m_3 중 depth first 규칙에 의해 m_2 선택



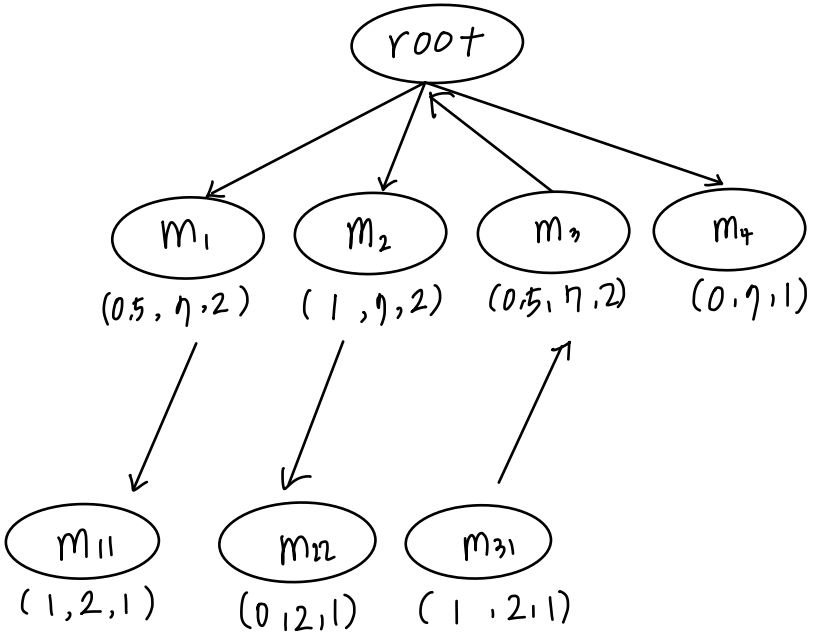
⇒ m_{22}가 선택되는 것으로 가정



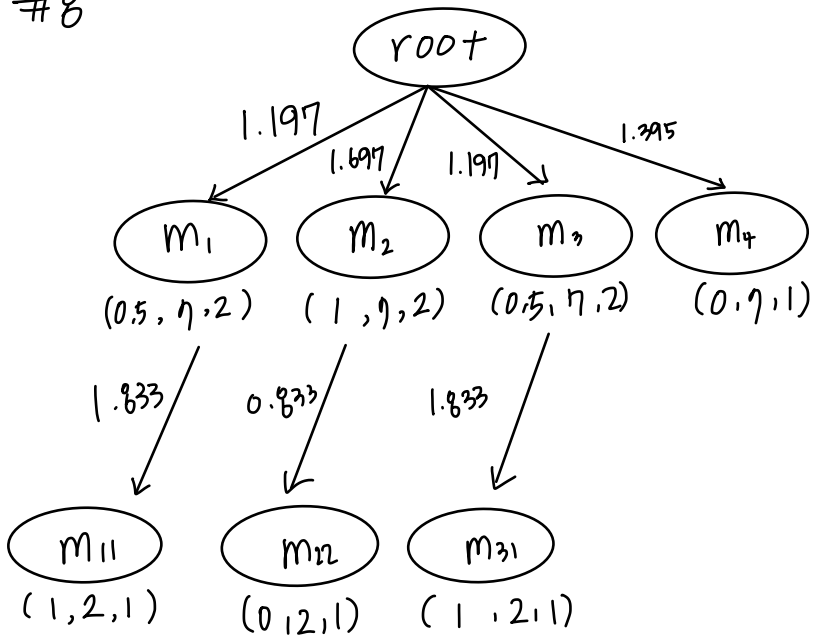
#7 => m_3 선택



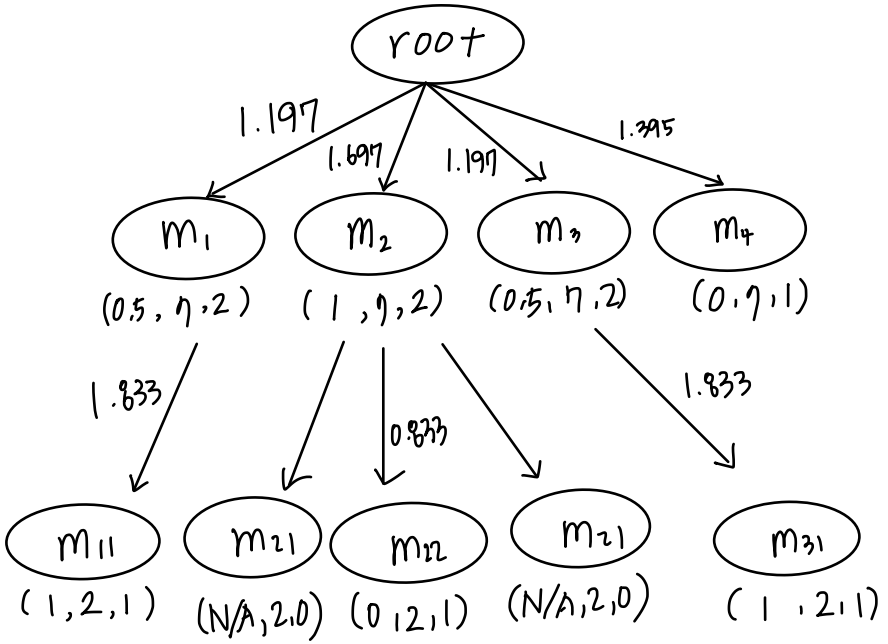
=> m_{31}, m_{32}, m_{33} 의 UCT = ∞ 으로 같으므로 m_{31} 선택

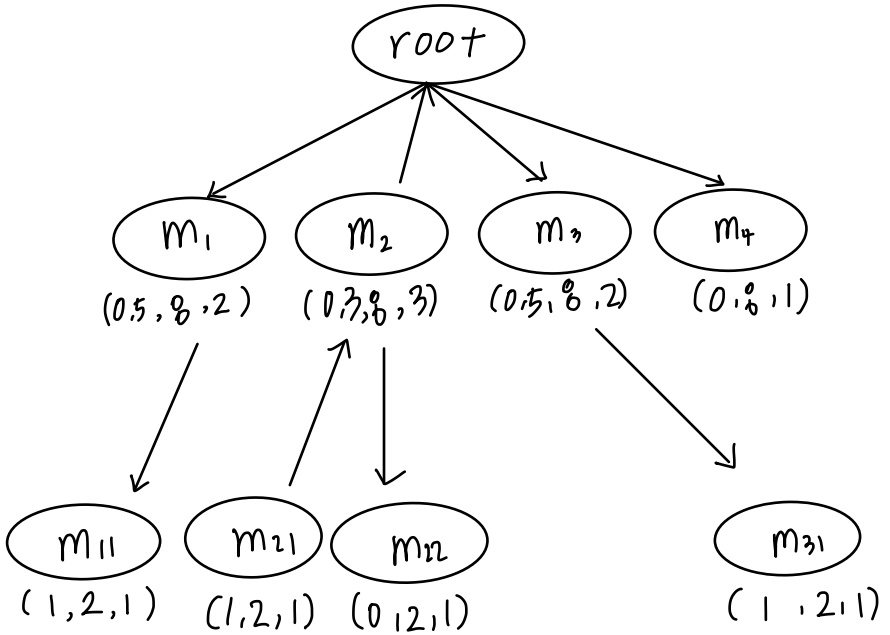


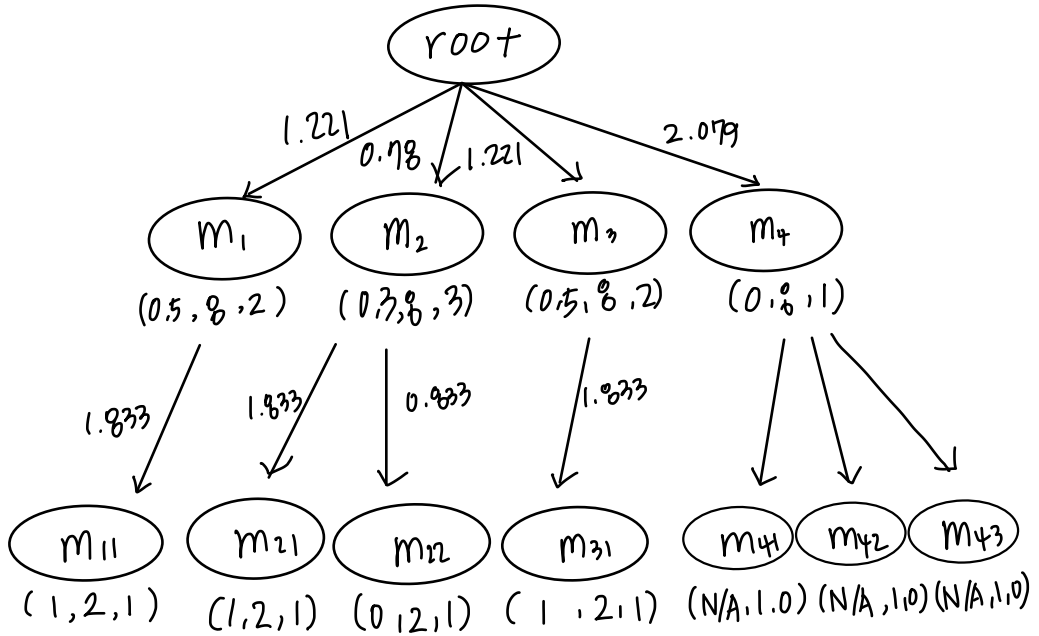
#8



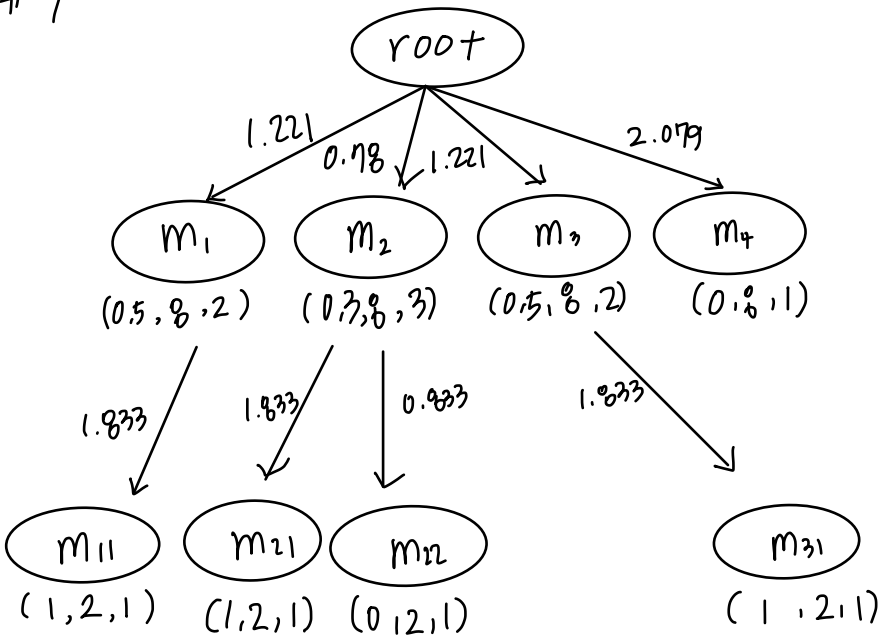
=> UCT 값이 가장 큰 m_2의 자식노드중 m_{21} 선택

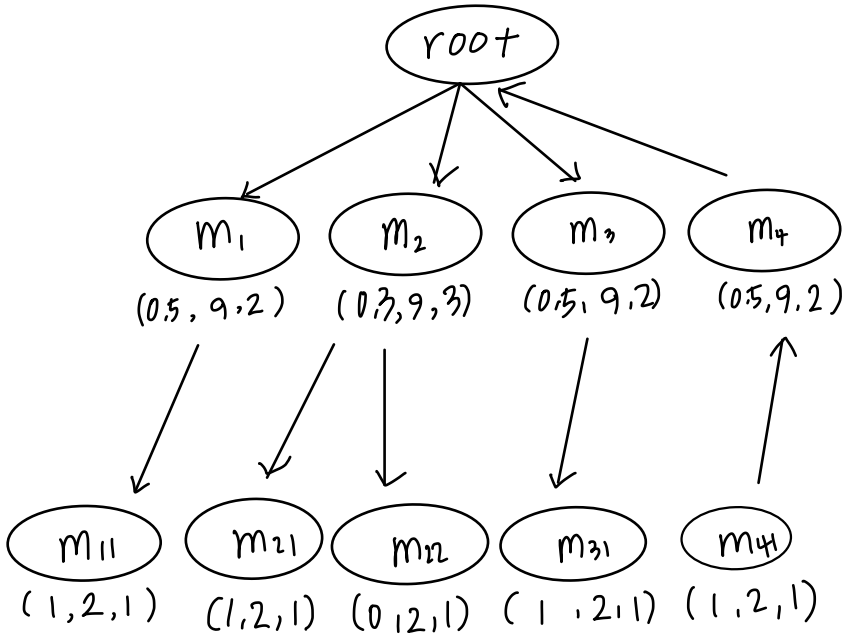



root
m_1
m_2
m_3
m_4
(0.5, 8, 2)
(0.3, 8, 3)
(0.5, 8, 2)
(0.8, 1)
m_{11}
m_{21}
m_{12}
m_{31}
(1, 2, 1)
(1, 2, 1)
(0, 2, 1)
(1, 2, 1)

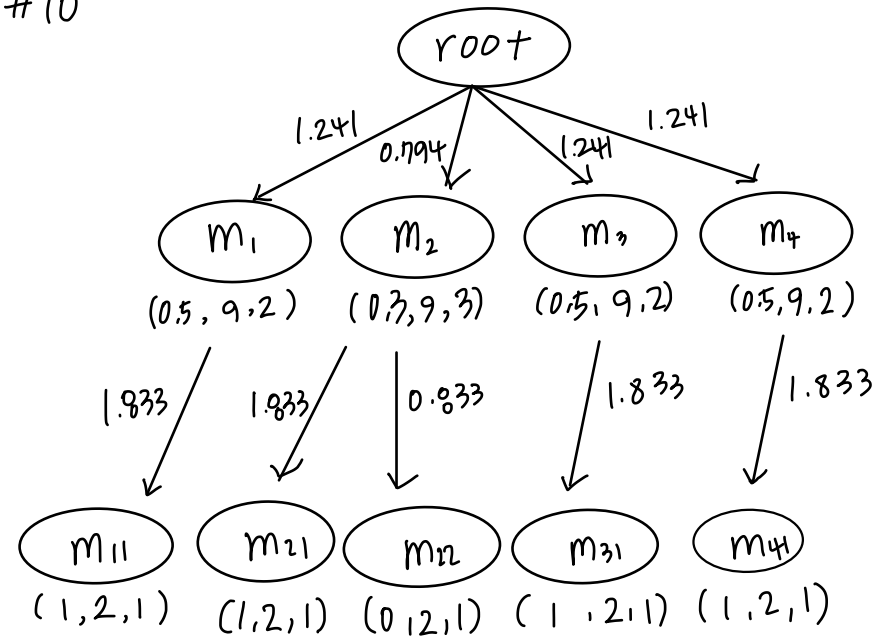

root
1.221
0.78
1.221
2.079
m_1
m_2
m_3
m_4
(0.5, 8, 2)
(0.3, 8, 3)
(0.5, 8, 2)
(0.8, 1)
1.833
1.833
0.833
1.833
m_{11}
m_{21}
m_{12}
m_{31}
m_{41}
m_{42}
m_{43}
(1, 2, 1)
(1, 2, 1)
(0, 2, 1)
(1, 2, 1)
(N/A, 1.0)
(N/A, 1.0)
(N/A, 1.0)

#9

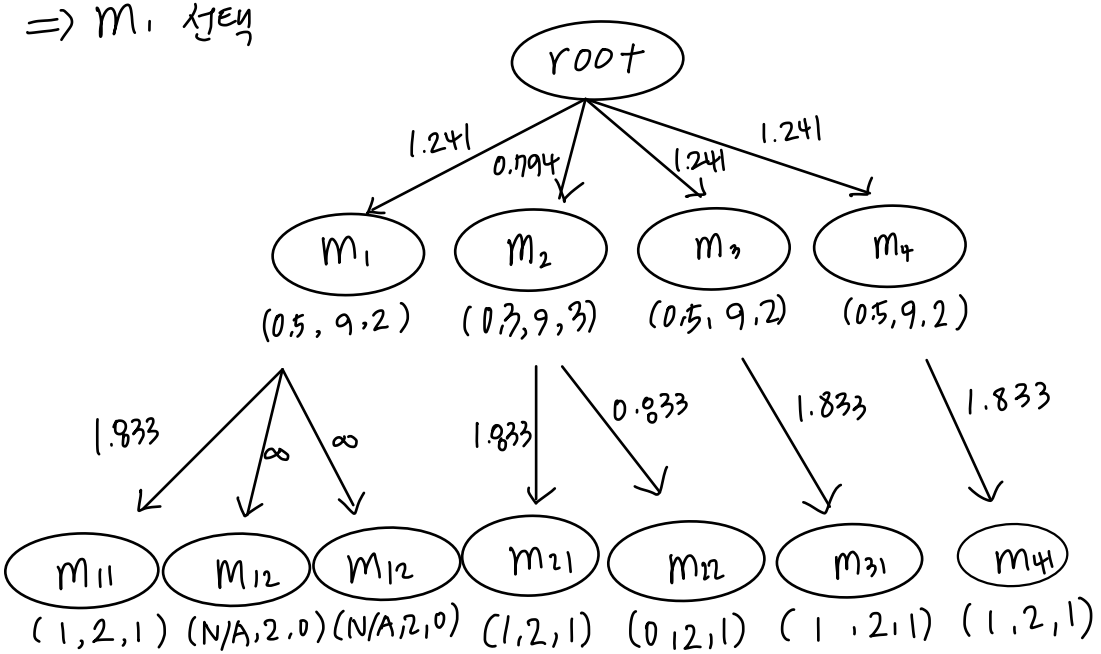

root
1.221
0.78
1.221
2.079
m_1
m_2
m_3
m_4
(0.5, 8, 2)
(0.3, 8, 3)
(0.5, 8, 2)
(0.8, 1)
1.833
1.833
0.833
1.833
m_{11}
m_{21}
m_{12}
m_{31}
(1, 2, 1)
(1, 2, 1)
(0, 2, 1)
(1, 2, 1)

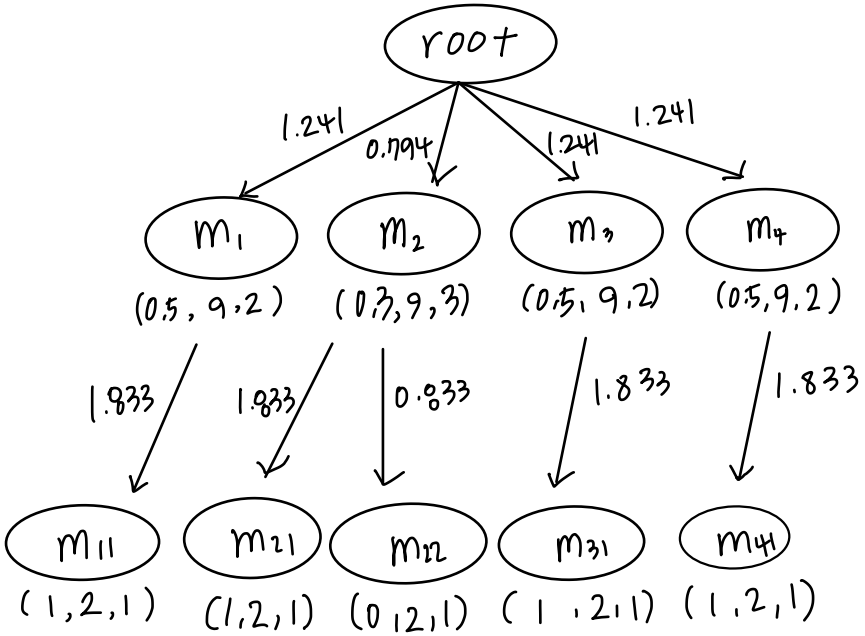

root
m_1
m_2
m_3
m_4
(0.5, 9, 2)
(0.3, 9, 3)
(0.5, 9, 2)
(0.5, 9, 2)
m_{11}
m_{21}
m_{12}
m_{31}
m_{41}
(1, 2, 1)
(1, 2, 1)
(0, 2, 1)
(1, 2, 1)
(1, 2, 1)

#10

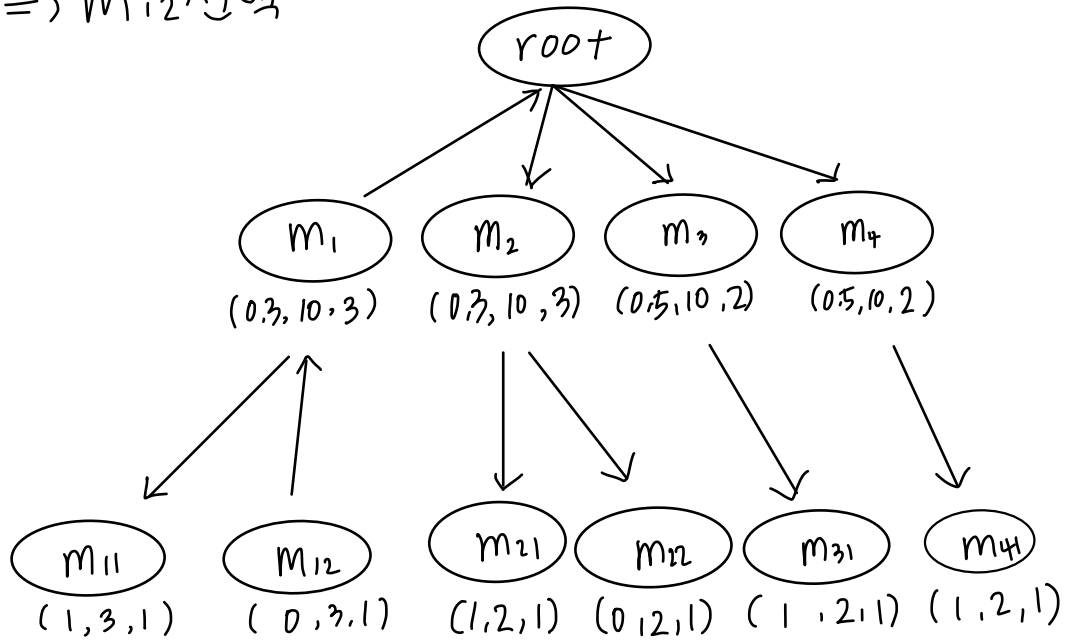


⇒ m_1 선택

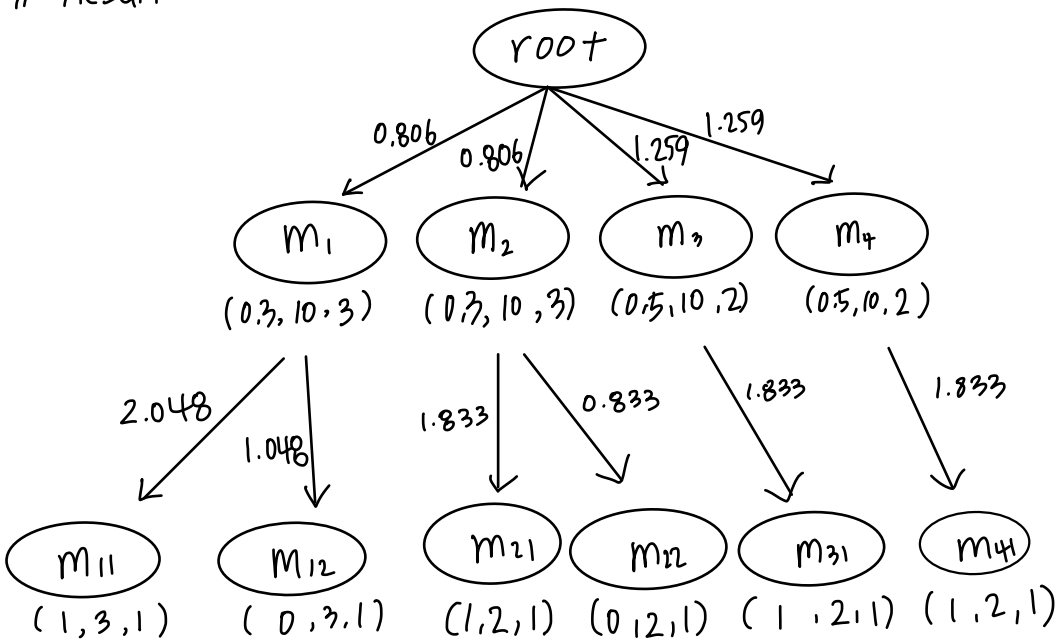




⇒ m_{12} 선택



Result


root
0.806
0.806
1.259
1.259
m_1
m_2
m_3
m_4
(0.3, 10, 3)
(0.3, 10, 3)
(0.5, 10, 2)
(0.5, 10, 2)
2.048
1.048
1.833
0.833
1.833
1.833
m_{11}
m_{12}
m_{21}
m_{22}
m_{31}
m_{41}
(1, 3, 1)
(0, 3, 1)
(1, 2, 1)
(0, 2, 1)
(1, 2, 1)
(1, 2, 1)