Probabilities: $k_1 < k_2 < k_3 < k_4$

$\frac{3}{8}$ $\frac{3}{8}$ $\frac{1}{8}$ $\frac{1}{8}$

M(Cost Table)

i \ j	0	1	2	3	4
1	0	$\frac{3}{8}$	$\frac{9}{8}$	$\frac{11}{8}$	$\frac{14}{8}$
2		0	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{8}{8}$
3			0	$\frac{1}{8}$	$\frac{3}{8}$
4				0	$\frac{1}{8}$
5					0

R

i \ j	0	1	2	3	4
1	0	1	1 or 2	2	2
2		0	2	2	2
3			0	3	3 or 4
4				0	4
5					0

Keep Optimal root

$$M[i][j] = \min_{i \le k \le j} (M[i][k-1] + M[k+1][j]) + \sum_{m=i}^{j} P_m$$

$$M[1][2] = \min_{1 \le k \le 2} \begin{cases} K=1: & 0 + \overbrace{M[2][2]}^{\frac{3}{8}} \\ K=2: & \underbrace{M[1][1]}_{\frac{3}{8}} + 0 \end{cases} + \underbrace{\sum_{m=1}^{2} P_m}_{\frac{6}{8}} = \frac{9}{8} \rightarrow k=1 \text{ or } k=2$$

$$M[2][3] = \min_{2 \le k \le 3} \begin{cases} K=2 & 0 + \overbrace{M[3][3]}^{\frac{1}{8}} \\ K=3 & \underbrace{M[2][2]}_{\frac{3}{8}} + 0 \end{cases} + \underbrace{\sum_{m=2}^{3} P_m}_{\frac{4}{8}} = \frac{5}{8} \rightarrow k=2$$

$$M[3][4] = \min_{3 \le k \le 4} \begin{cases} K=3 & 0 + \overbrace{M[4][4]}^{\frac{1}{8}} \\ K=4 & \underbrace{M[3][3]}_{\frac{1}{8}} + 0 \end{cases} + \underbrace{\sum_{m=3}^{4} P_m}_{\frac{2}{8}} = \frac{3}{8} \rightarrow k=3 \text{ or } k=4$$

$$M[1][3]=\min_{1\le k\le 3}\begin{cases}\text{K=1:} & \cancel{M[1][0]}^{0}+\overbrace{M[2][3]}^{\frac{5}{8}}\\ \text{K=2:} & M[1][1]+M[3][3]+\underbrace{\sum_{m=1}^{3}P_m}_{\frac{7}{8}}=\frac{11}{8}\\ \text{K=3:} & \underbrace{M[1][2]}_{\frac{9}{8}}+\cancel{M[4][3]}^{0}\end{cases}\rightarrow k=2$$

$$M[2][4]=\min_{2\le k\le 4}\begin{cases}\text{K=2} & \cancel{M[2][1]}^{0}+\overbrace{M[3][4]}^{\frac{3}{8}}\\ \text{K=3} & M[2][2]+M[4][4]+\underbrace{\sum_{m=2}^{4}P_m}_{\frac{5}{8}}=\frac{8}{8}\\ \text{K=4} & \underbrace{M[2][3]}_{\frac{5}{8}}+\cancel{M[5][4]}^{0}\end{cases}\rightarrow k=2$$

$$M[1][4]=\min_{1\le k\le 4}\begin{cases}\text{K=1} & \cancel{M[1][0]}^{0}+\overbrace{M[2][4]}^{\frac{8}{8}}\\ \text{K=2} & M[1][1]+M[3][4]\\ \text{K=3} & M[1][2]+M[4][4]+\underbrace{\sum_{m=1}^{4}P_m}_{\frac{8}{8}}=\frac{14}{8}\\ \text{K=4} & \underbrace{M[1][3]}_{\frac{11}{8}}+\cancel{M[5][4]}^{0}\end{cases}\rightarrow k=2$$

From R Table: