

#### Lampiran 4 :

Perhitungan  $ES_{(i)}$ ,  $LC_{(i)}$ ,  $ES_{(j)}$ ,  $LC_{(j)}$  secara manual.

$$ES_0 = 0$$

$$ES_1 = ES_0 + D_{0,1} = 0 + 7 = 7$$

$$ES_2 = ES_1 + D_{1,2} = 7 + 5 = 12$$

$$ES_3 = ES_2 + D_{2,3} = 12 + 10 = 22$$

$$ES_4 = ES_3 + D_{3,4} = 22 + 5 = 27$$

$$ES_5 = \max\{ES_4 + D_{4,5}; ES_7 + D_{7,5}\} = \max\{27 + 20; 39 + 0\} = 47$$

$$ES_6 = ES_4 + D_{4,6} = 27 + 5 = 32$$

$$ES_7 = ES_4 + D_{4,7} = 27 + 15 = 42$$

$$ES_8 = ES_5 + D_{5,8} = 47 + 1 = 48$$

$$ES_9 = ES_8 + D_{8,9} = 48 + 35 = 83$$

$$ES_{10} = ES_6 + D_{6,10} = 32 + 60 = 92$$

$$ES_{11} = ES_8 + D_{8,11} = 48 + 30 = 78$$

$$ES_{12} = ES_8 + D_{8,12} = 48 + 10 = 58$$

$$ES_{13} = \max\{ES_9 + D_{9,13}; ES_{10} + D_{10,13}; ES_{11} + D_{11,13}\} \\ = \max\{83 + 50; 92 + 0; 78 + 0\} = 133$$

$$ES_{14} = \max\{ES_{13} + D_{13,14}; ES_{26} + D_{26,14}\} = \{133 + 60; 153 + 2\} = 193$$

$$ES_{15} = ES_{12} + D_{12,15} = 58 + 20 = 78$$

$$ES_{16} = ES_{15} + D_{15,16} = 78 + 15 = 93$$

$$ES_{17} = ES_{16} + D_{16,17} = 93 + 2 = 95$$

$$ES_{18} = ES_{17} + D_{17,18} = 95 + 1 = 96$$

$$ES_{19} = ES_{18} + D_{18,19} = 96 + 1 = 97$$

$$ES_{20} = ES_{19} + D_{19,20} = 97 + 7 = 104$$

$$ES_{21} = ES_{20} + D_{20,21} = 104 + 14 = 118$$

$$ES_{22} = ES_{21} + D_{21,22} = 118 + 2 = 120$$

$$ES_{23} = ES_{22} + D_{22,23} = 120 + 1 = 121$$

$$ES_{24} = ES_{23} + D_{23,24} = 121 + 1 = 122$$

$$ES_{25} = ES_{24} + D_{24,25} = 122 + 21 = 143$$

$$ES_{26} = ES_{25} + D_{25,26} = 143 + 10 = 153$$

$$ES_{27} = ES_{14} + D_{14,27} = 193 + 20 = 213$$

$$ES_{28} = \max\{ES_{14} + D_{14,28}; ES_{27} + D_{27,28}\} = \max\{193 + 18; 213 + 0\} = 213$$

$$ES_{29} = \max\{ES_{14} + D_{14,29}; ES_{28} + D_{28,29}\} = \max\{193 + 15; 213 + 0\} = 213$$

$$ES_{30} = \max\{ES_{14} + D_{14,30}; ES_{29} + D_{29,30}\} = \max\{193 + 10; 213 + 0\} = 213$$

$$ES_{31} = \max\{ES_{14} + D_{14,31}; ES_{30} + D_{30,31}\} = \max\{193 + 8; 213 + 0\} = 213$$

$$ES_{32} = \max\{ES_{14} + D_{14,32}; ES_{31} + D_{31,32}; ES_{33} + D_{33,32}\} \\ = \max\{193 + 5; 213 + 0; 195 + 0\} = 213$$

$$ES_{33} = \max\{ES_{14} + D_{14,33} ; ES_{34} + D_{34,33}\} = \max\{193 + 2; 195 + 0\} = 195$$

$$ES_{34} = ES_{14} + D_{14,34} = 193 + 2 = 195$$

$$ES_{35} = ES_{32} + D_{32,35} = 213 + 1 = 214$$

$$ES_{36} = ES_{35} + D_{35,36} = 214 + 1 = 215$$

$$ES_{37} = ES_{36} + D_{36,37} = 215 + 1 = 216$$

$$ES_{38} = ES_{36} + D_{36,38} = 215 + 1 = 216$$

$$ES_{39} = ES_{38} + D_{38,39} = 216 + 2 = 218$$

$$ES_{40} = \max\{ES_{37} + D_{37,40} ; ES_{39} + D_{39,40}\} = \max\{216 + 1; 218 + 0\} = 218$$

$$ES_{41} = ES_{40} + D_{40,41} = 218 + 1 = 219$$

$$ES_{42} = ES_{41} + D_{41,42} = 219 + 1 = 220$$

$$LC_{42} = ES_{42} = 220$$

$$LC_{41} = LC_{42} - D_{41,42} = 220 - 1 = 219$$

$$LC_{40} = LC_{41} - D_{40,41} = 219 - 1 = 218$$

$$LC_{39} = LC_{40} - D_{39,40} = 218 - 0 = 218$$

$$LC_{38} = LC_{39} - D_{38,39} = 218 - 2 = 216$$

$$LC_{37} = LC_{40} - D_{37,40} = 218 - 1 = 217$$

$$LC_{36} = \min\{LC_{38} - D_{36,38}; LC_{37} - D_{36,37}\} = \min\{216 - 1; 217 - 1\} = 215$$

$$LC_{35} = LC_{36} - D_{35,36} = 215 - 1 = 214$$

$$LC_{34} = LC_{33} - D_{34,33} = 213 - 0 = 213$$

$$LC_{33} = LC_{32} - D_{33,32} = 213 - 0 = 213$$

$$LC_{32} = LC_{35} - D_{32,35} = 214 - 1 = 213$$

$$LC_{31} = LC_{32} - D_{31,32} = 213 - 0 = 213$$

$$LC_{30} = LC_{31} - D_{30,31} = 213 - 0 = 213$$

$$LC_{29} = LC_{30} - D_{29,30} = 213 - 0 = 213$$

$$LC_{28} = LC_{29} - D_{28,29} = 213 - 0 = 213$$

$$LC_{27} = LC_{28} - D_{27,28} = 213 - 0 = 213$$

$$LC_{26} = LC_{14} - D_{14,26} = 193 - 2 = 191$$

$$LC_{25} = LC_{26} - D_{25,26} = 191 - 10 = 181$$

$$LC_{24} = LC_{25} - D_{24,25} = 181 - 21 = 160$$

$$LC_{23} = LC_{24} - D_{23,24} = 160 - 1 = 159$$

$$LC_{22} = LC_{23} - D_{22,23} = 159 - 1 = 158$$

$$LC_{21} = LC_{22} - D_{21,22} = 158 - 2 = 156$$

$$LC_{20} = LC_{21} - D_{20,21} = 156 - 14 = 142$$

$$LC_{19} = LC_{20} - D_{19,20} = 142 - 7 = 135$$

$$LC_{18} = LC_{19} - D_{18,19} = 135 - 1 = 134$$

$$LC_{17} = LC_{18} - D_{17,18} = 134 - 1 = 133$$

$$LC_{16} = LC_{17} - D_{16,17} = 133 - 2 = 131$$

$$LC_{15} = LC_{16} - D_{15,16} = 131 - 15 = 116$$

$$LC_{14} = \min \{LC_{27} - D_{14,27}; LC_{28} - D_{14,28}; LC_{29} - D_{14,29}; LC_{30} - D_{14,30}; \\ LC_{31} - D_{14,31}; LC_{32} - D_{14,32}; LC_{33} - D_{14,33}; LC_{34} - D_{14,34}\} \\ = \min \{213 - 20; 213 - 18; 213 - 15; 213 - 10; 213 - 8; 213 - 5; \\ 213 - 2; 213 - 2\} = 193$$

$$LC_{13} = LC_{14} - D_{13,14} = 193 - 60 = 133$$

$$LC_{12} = LC_{15} - D_{12,15} = 116 - 20 = 96$$

$$LC_{11} = LC_{13} - D_{11,13} = 133 - 0 = 133$$

$$LC_{10} = LC_{13} - D_{10,13} = 133 - 0 = 133$$

$$LC_9 = LC_{13} - D_{9,13} = 133 - 50 = 83$$

$$LC_8 = \min \{LC_9 - D_{8,9}; LC_{11} - D_{8,11}; LC_{12} - D_{8,12}\} \\ = \min \{83 - 35; 133 - 28; 96 - 8\} = 48$$

$$LC_7 = LC_5 - D_{5,7} = 47 - 0 = 47$$

$$LC_6 = LC_{10} - D_{6,10} = 133 - 60 = 73$$

$$LC_5 = LC_8 - D_{5,8} = 48 - 1 = 47$$

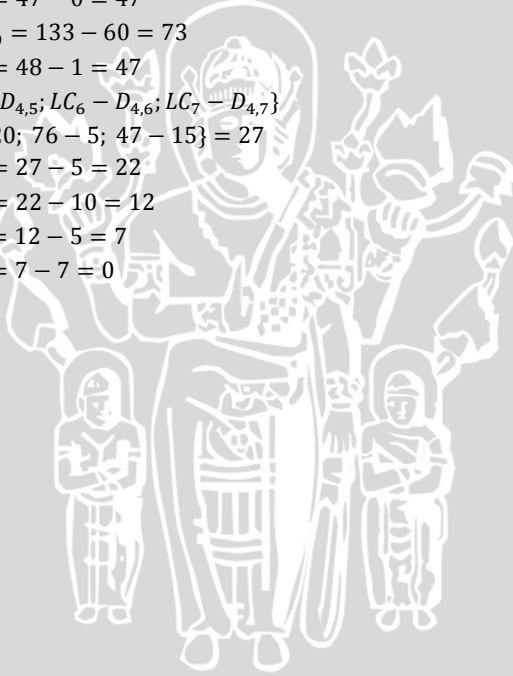
$$LC_4 = \min \{LC_5 - D_{4,5}; LC_6 - D_{4,6}; LC_7 - D_{4,7}\} \\ = \min \{47 - 20; 76 - 5; 47 - 15\} = 27$$

$$LC_3 = LC_4 - D_{3,4} = 27 - 5 = 22$$

$$LC_2 = LC_3 - D_{2,3} = 22 - 10 = 12$$

$$LC_1 = LC_2 - D_{1,2} = 12 - 5 = 7$$

$$LC_0 = LC_1 - D_{0,1} = 7 - 7 = 0$$



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