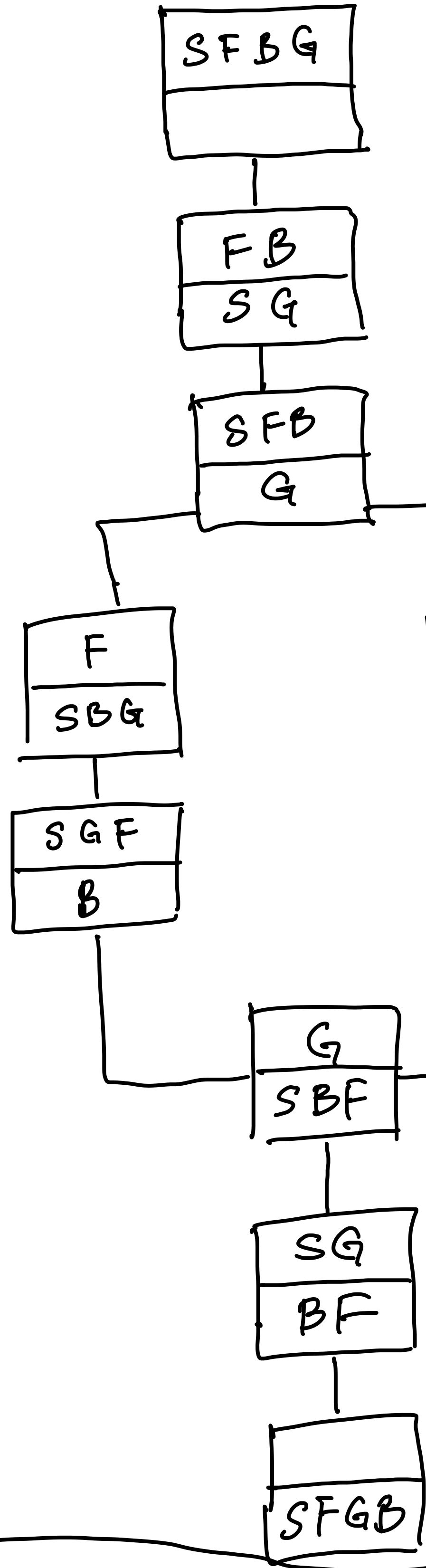
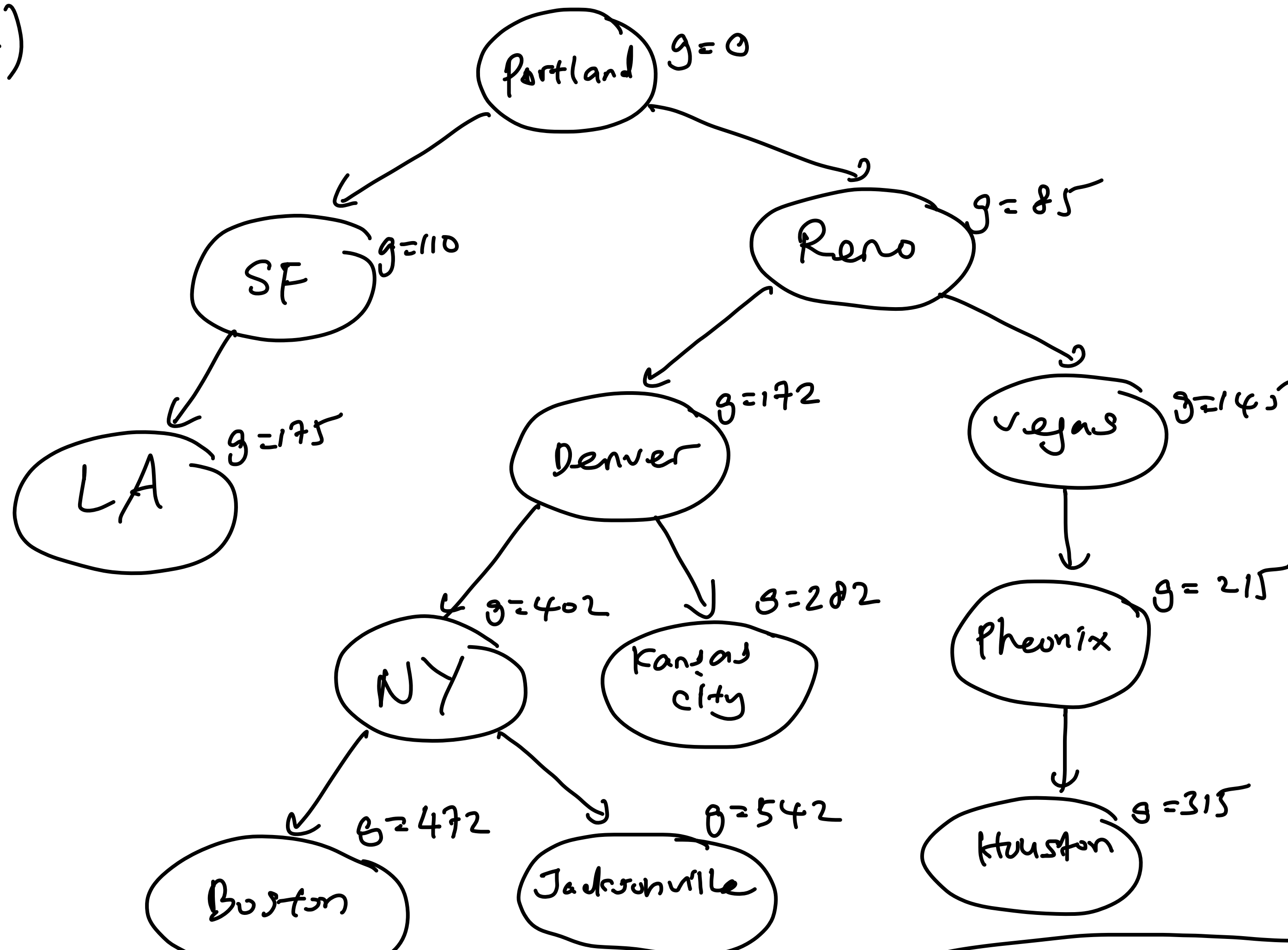
Q1(a)



Q1(b) branching factor = 3

Q1(c) 7 river crossings.

Q2(a)



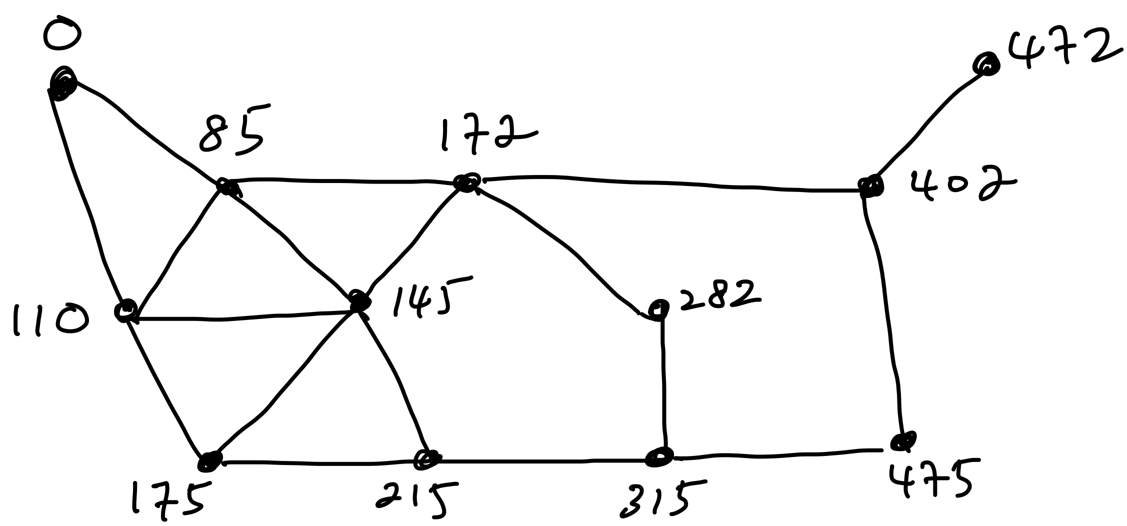
Q2(b)

$$S(c) = \begin{cases} 0 & \text{if } c = c_{start} \\ \min\limits_{c' \in \text{predecessor}(c)} \text{stepcost}(c', c) + S(c) & \text{otherwise} \end{cases}$$

OR

The start distance of a given state is the shortest distance from the start state to the given state.

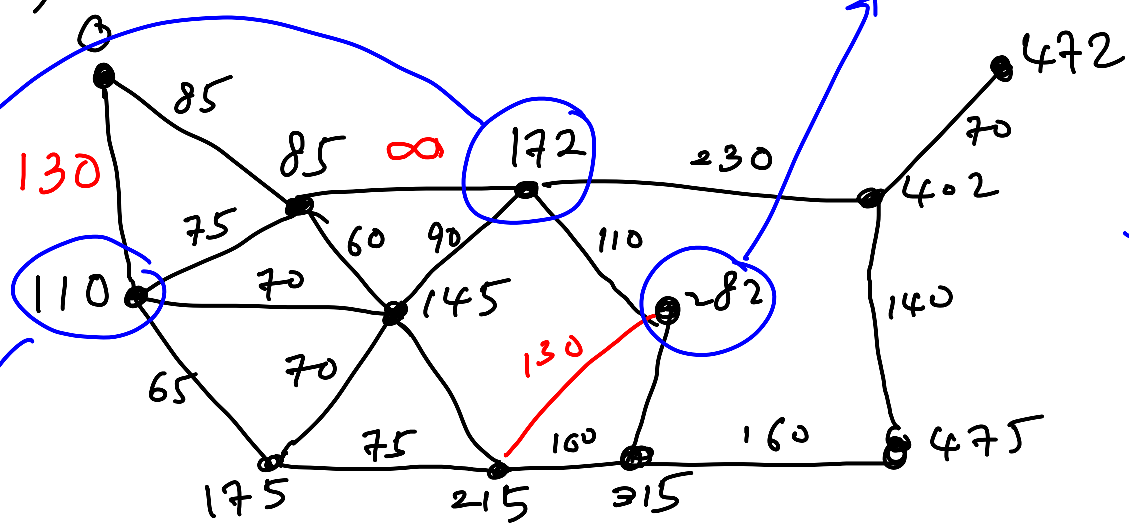
Q2(c)



Q2(d)

Starting from the goal state, follow a path that greedily decreases the start distance.

Q2(e)



Answer: San Francisco and Denver

g-value = 110

rhs-value = min(0+130, 85+75, 145+70, 175+65)

= 130

110 ≠ 130 ⇒ locally inconsistent.

g-value = 172

rhs-value = min($\underbrace{85+\infty}_{\text{or just ignore}}$, 145+90, 282+110, 402+230)

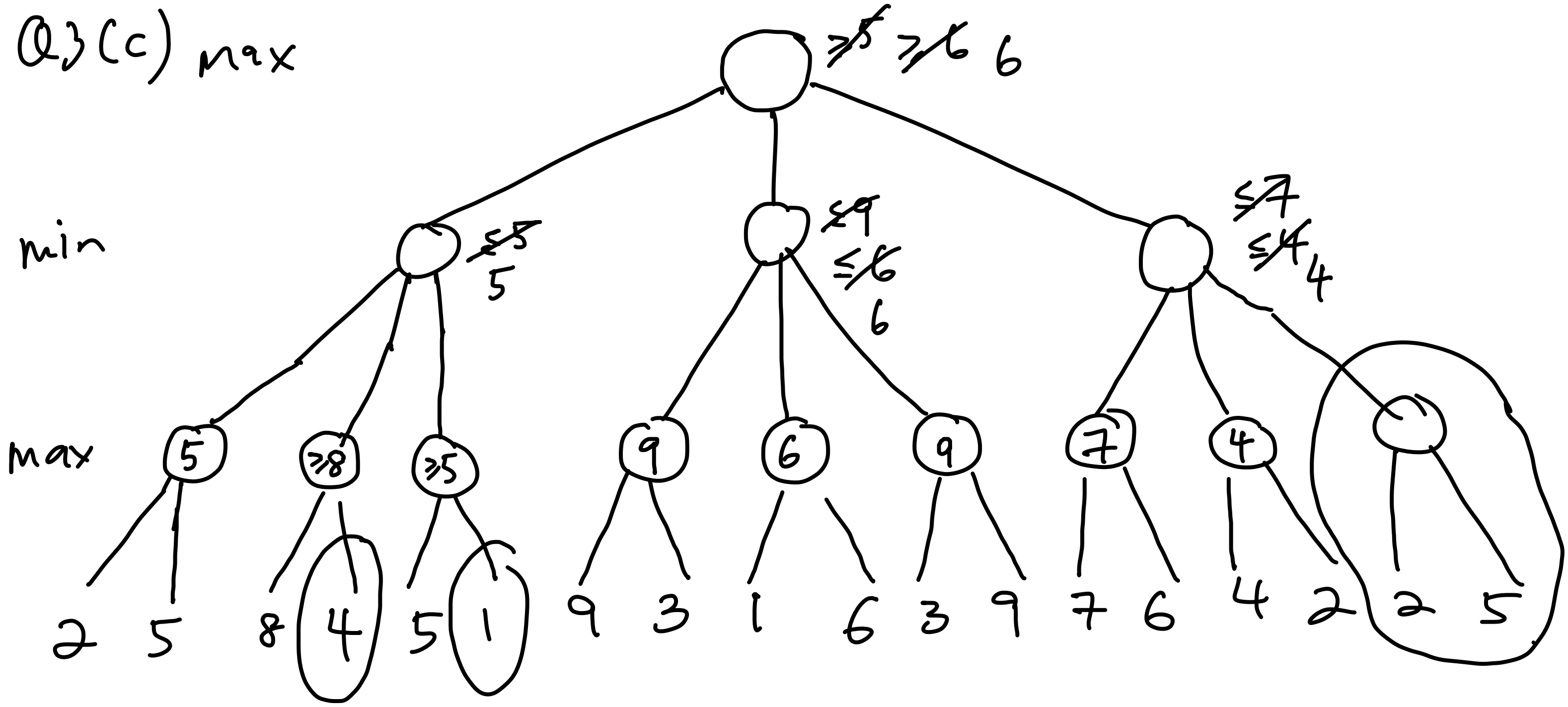
= 235

172 ≠ 235 ⇒ locally inconsistent

Q3(a) The board state is known to both players.

Q3(b) Cannot make repetitive moves that return to the same board state.

Q3(c)



Q3(d) Function 1 and function 4.

These functions are monotonically increasing.

or

these functions do not change the ordering of the utility values.

Q3(e) Since the level before the leaf is Max's turn, reorder each branch at the leaf level decreasingly based on utility values.