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CIS 471: Introduction to Artificial Intelligence

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Homework 2

1. **Campus Layout**

   i. Provide the domains of all variables after unary constraints have been applied.

(1, 1) A, C	**(1, 2)** C, D	**(1, 3)** A, B, C, D
(2, 1) C, D	**(2, 2)** A, C	**(2, 3)** A, B, C, D

   ii. Enforce $A \rightarrow B$

(1, 1) C	**(1, 2)** C, D	**(1, 3)** A, B, C, D
(2, 1) C, D	**(2, 2)** A, C	**(2, 3)** A, B, C, D

   iii. Enforce $C \rightarrow B$

(1, 1)	**(1, 2)** C, D	**(1, 3)** A, B, C, D
(2, 1) D	**(2, 2)** A, C	**(2, 3)** A, B, C, D

   iv. $A \rightarrow C, B \rightarrow C$

   v. Enforce remaining constraints in queue.

(1, 1)	**(1, 2)** C, D	**(1, 3)** A, B, C, D
(2, 1) D	**(2, 2)** A, C	**(2, 3)** A, B, C

   vi. B

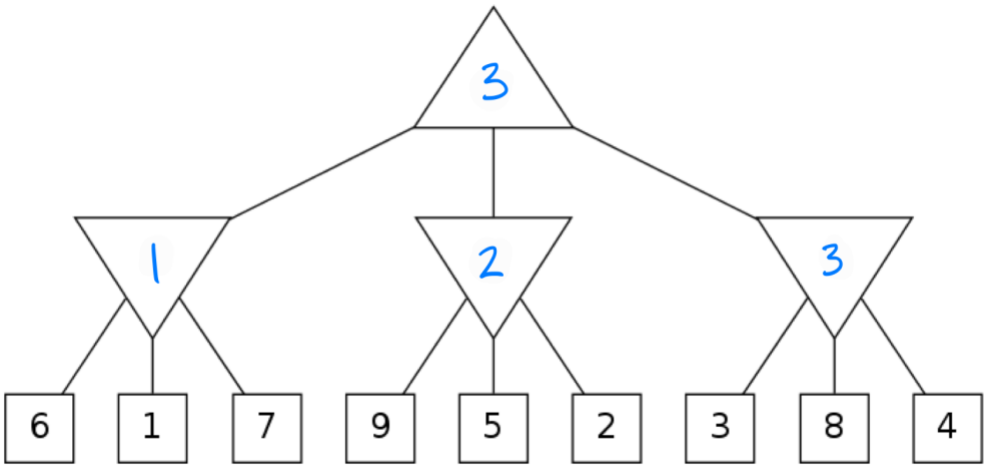
vii. (1, 3)

viii. Provide the domains of all variables after assignment of LCV is applied.

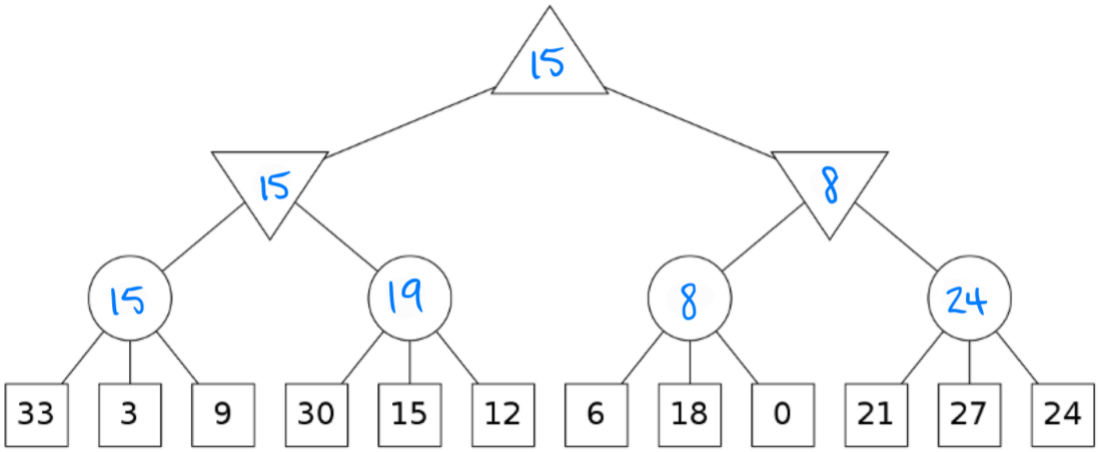
(1, 1)	**(1, 2)**	**(1, 3)**
(2, 1)	**(2, 2)**	**(2, 3)**

2. **Minimax and Expectimax**

i. Minimax



ii. Expectimax

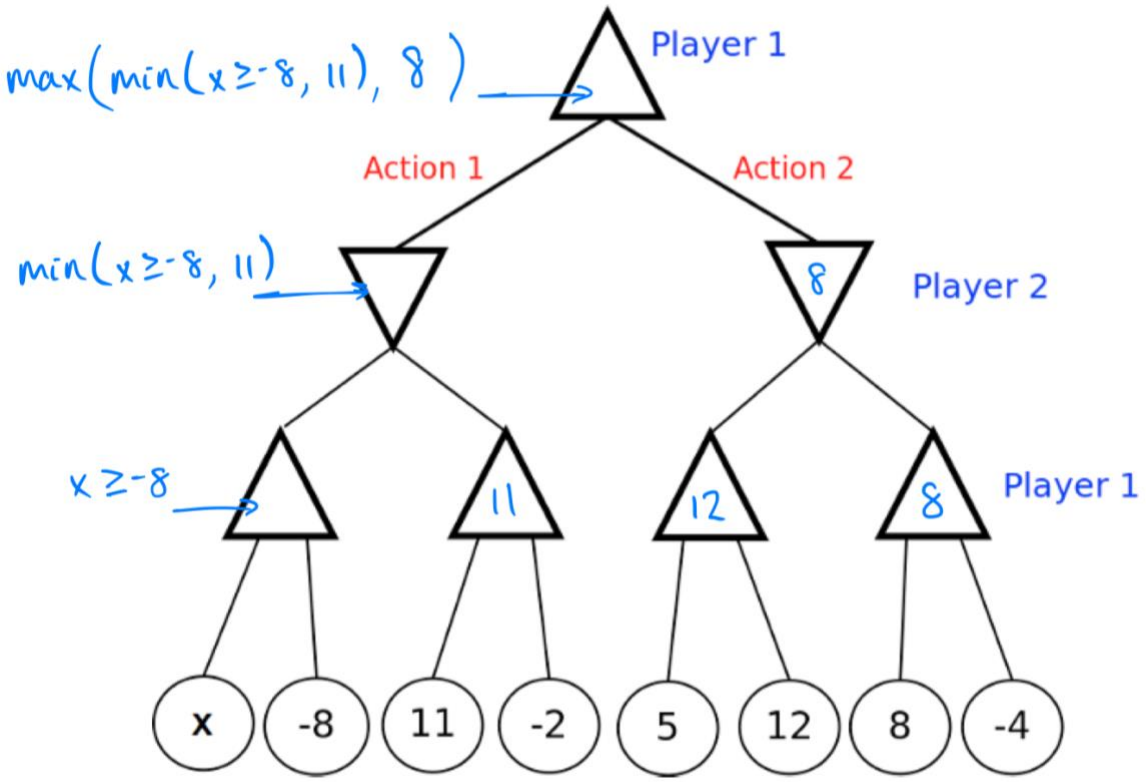


3. **Unknown Leaf Value**

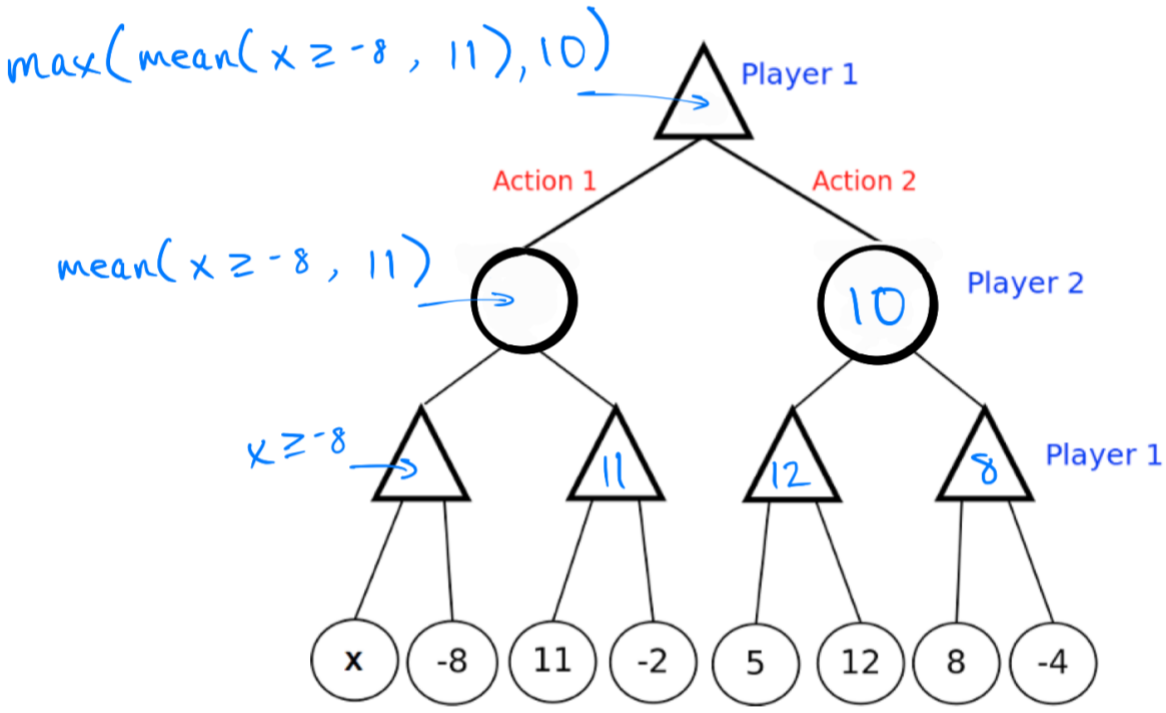
i. x > 8

ii. x > 9

iii. Player 2 (minimax):



Player 2 (expectimax):

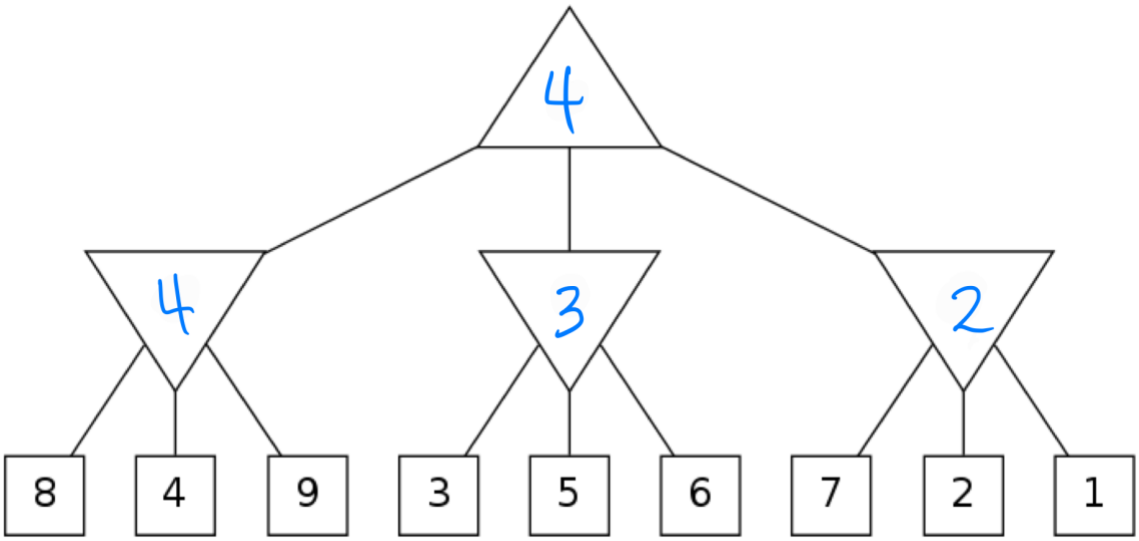


No values of *x* will result in minimax value > expectimax value.

iv. No

4. **Alpha-Beta Pruning**

   i. Enter the values of the labeled nodes.



   ii. Select the leaf nodes that don't get visited due to pruning.