HW2

This assessment contains questions that allow partial and negative credit. Dismiss

0 OF 13 QUESTIONS REMAINING

Test Content

Question 1

3 Points

Consider a CSP with variables X,Y with domains {1,2,3,4,5,6} for X and {2,4,6} for Y, and constraints X <Y and X+ Y >8. List the values that will remain in the domain of X after enforcing arc consistency for the arc X →Y

A 1

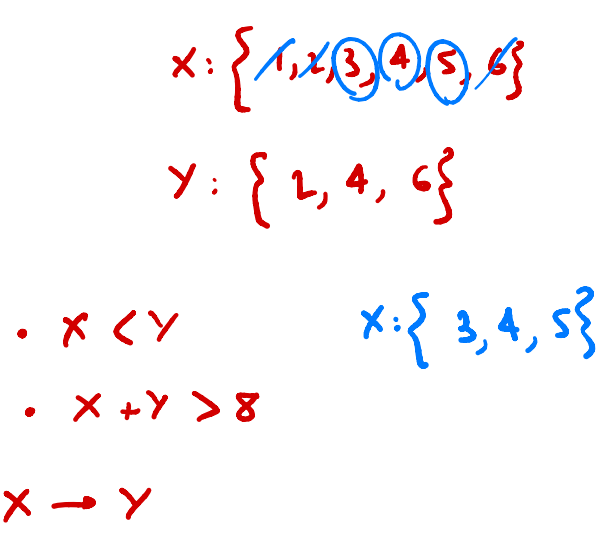
B 2

C 3

D 4

E 5

F 6



AUS is planning to host an event that recognizes the achievements of multiple historical figures. Using our time machine, we have invited the following guests: Ada **L**ovelace, Ghassan **K**anafani, James **B**aldwin, Radwa **A**shour, Alan **T**uring, Steve **J**obs, and Rachel **C**orrie. The event lasts from (1PM until 3PM) and we need to schedule it based on the following speakers and students constraints.

1. Alan **T**uring must talk at the 1 PM slot as he needs to get home early and help win WW2.
2. Ada **L**ovelace cannot speak at 3 PM as she has a meeting with Dr. Imran.
3. James **B**aldwin must speak at 3 as he is booked for 1 and 2 PM.
4. The computer science and engineering students want to attend the talks of Ada **L**ovelace, Alan **T**uring, and Steve **J**obs.
5. The woman empowerment members want to attend the talks of Ada **L**ovelace, Radwa **A**shour, and Rachel **C**orrie.
6. The Palestinian club members want to attend the talks of Ghassan **K**anafani, James **B**aldwin, and Rachel **C**orrie.
7. The literature and arts students want to attend the talks of Ghassan **K**anafani and Radwa **A**shour.

8. Finally, you want to attend the talks of Ada **L**ovelace and James **B**aldwin.

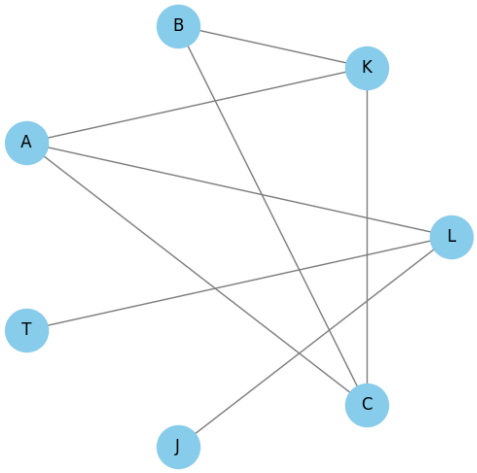
Question 2

6 Points

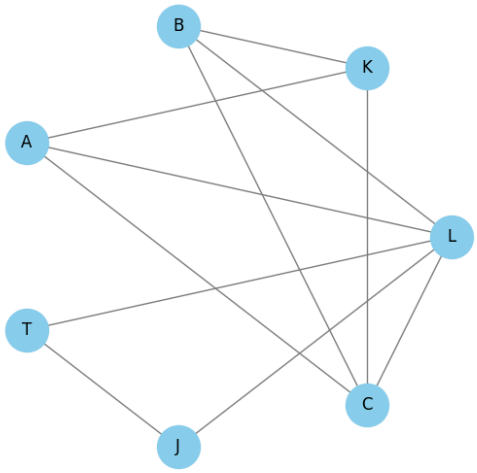
Which of the following Constraints Graphs represents the problem above?

Speaker Constraints Graphs

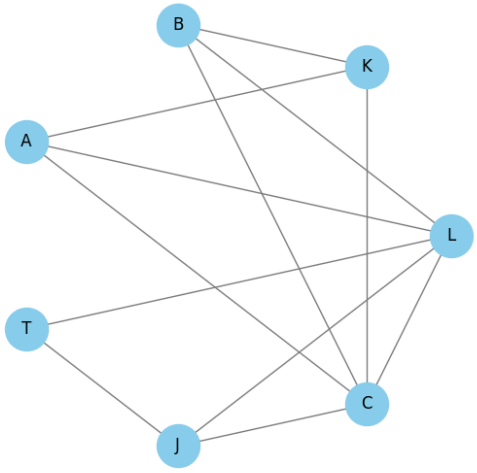
Graph A



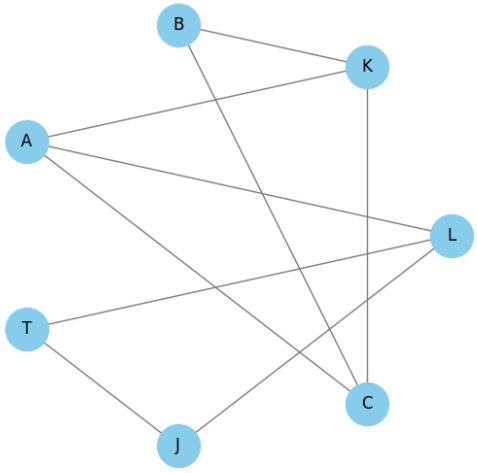
Graph B



Graph C



Graph D



(A) A

(B) B

(C) C

(D) D

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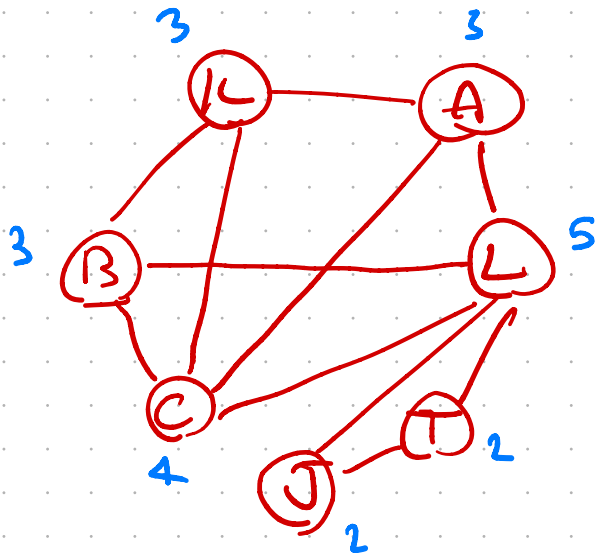


Check the number of things you're connected to.

MRV:

Assign T=1 because he has to be 1pm according to (1)

Assign B=3 because of (3)

Assign R=2

Assign K=2

Assign J=3

Assign C=1

Assign A=3

A	{1,3}	{3}
B	{3}	
C	{1,2}	{1}
J	{2,3}	{3}
IC	{1,2}	{2}
L	{1,2}	{2}
T	{1}	

Question 3

7 Points

Solve the problem above using MRV and degree heuristic and assign a timing for each individual.

Ada **L**ovelace **2** PM
Ghassan **K**anafani **2** PM
James **B**aldwin **3** PM
Radwa **A**shour **3** PM
Alan **T**uring **1** PM
Steve **J**obs **3** PM
Rachel **C**orrie **1** PM

Blank 1 2

Blank 2 2

Blank 3 3

Blank 4 3

Blank 5 1

Blank 6 3

Blank 7 1

Question 4

3 Points

Stella wants to assign tasks for her 3 employees based on their experience and availability.

Employee A, who is available to do task 3 and 4.
Employee B, who is available to do task 2, 3, 4, and 5.
Employee C, who is available to do task 1, 2, 3, 4, 5.

However some of these tasks cannot be done together as some are pre-requisites to the others as below:

$T1 \neq T2$
$T2 \neq T3$
$T3 \neq T4$
$T4 \neq T5$
$T2 \neq T4$
$T3 \neq T5$

$T_1 : C$
$T_2 : B$

Show the domains of the variables after enforcing arc-consistency.

A
$T1 \in \{C\}$
$T2 \in \{B\}$
$T3 \in \{A, C\}$
$T4 \in \{A, C\}$
$T5 \in \{B, C\}$

T_1	{C}
T_2	{B, ~~C~~} {B}
T_3	{A, ~~B~~, C} {A, C}
T_4	{A, ~~B~~, C} {A, C}
T_5	{B, C}

B
$T1 \in \{C\}$
$T2 \in \{B, C\}$
$T3 \in \{A, C\}$
$T4 \in \{A, C\}$
$T5 \in \{B, C\}$

C
$T1 \in \{C\}$
$T2 \in \{B\}$
$T3 \in \{A, C\}$
$T4 \in \{A, C\}$
$T5 \in \{B\}$

D
$T1 \in \{C\}$
$T2 \in \{B\}$
$T3 \in \{A, C\}$
$T4 \in \{A, C\}$
$T5 \in \{C\}$

Question 5

3 Points

What condition makes a game a zero-sum game?

A What is beneficial for one player is equally detrimental to the other player.

B Players cooperate to achieve outcomes favorable to both.

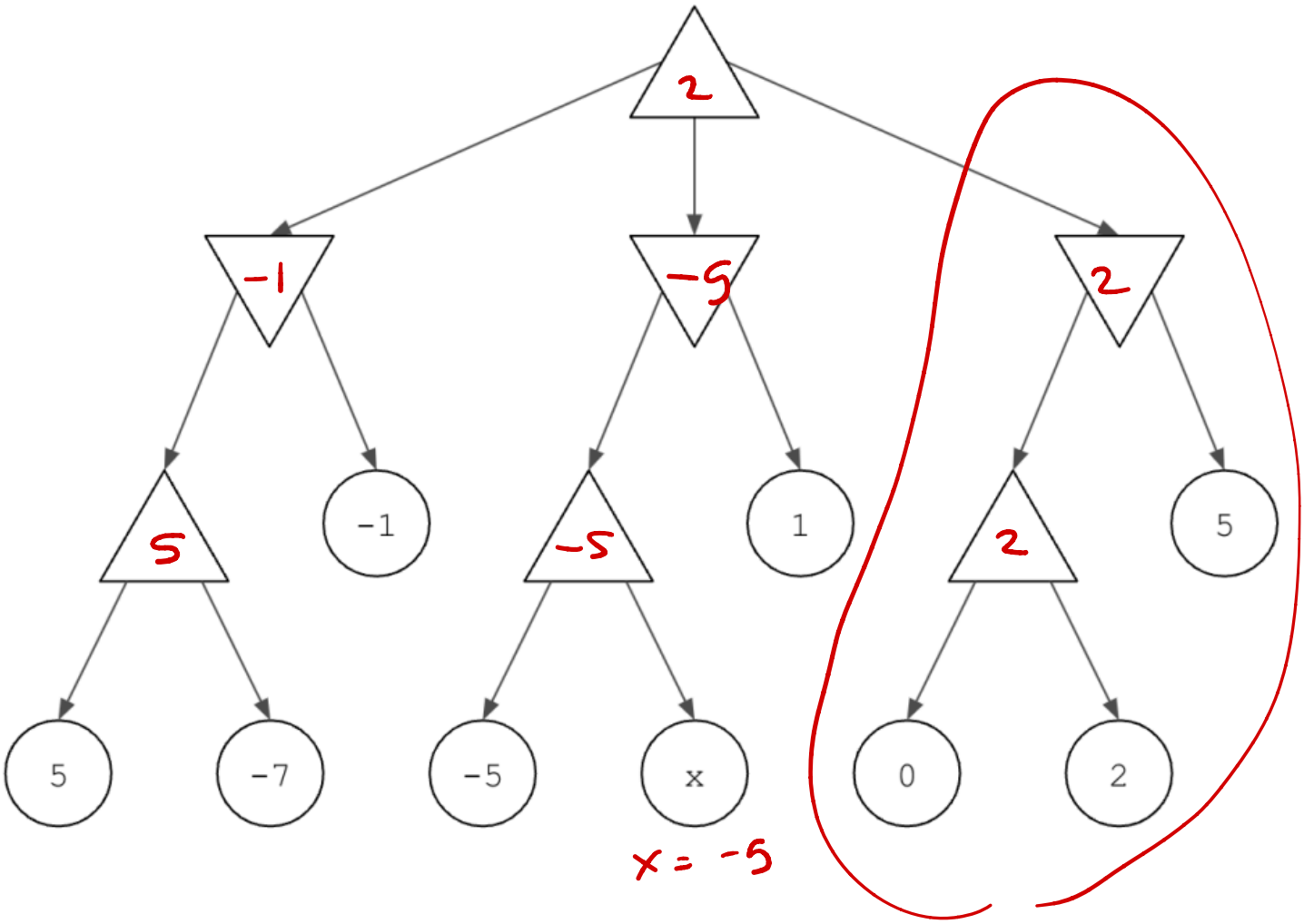
C The game's outcome results in either a win or a loss with no draws.

D Players can share points to achieve mutual goals.

Question 6

5 Points

Solve the following problem using Minimax algorithm. An upper triangle represents a maximizer while a lower triangle represents a minimizer. Report the value obtained at the root node. Assume that $x = -5$



2

Integer, decimal, or E notation allowed

Question 7

3 Points

Is there a way we could change the value of x such that the root node is losing (ends up negative)?

A No, the root node is going to win no matter the value of x

B Yes, if $x < -5$

C Yes, if $x \geq 1$

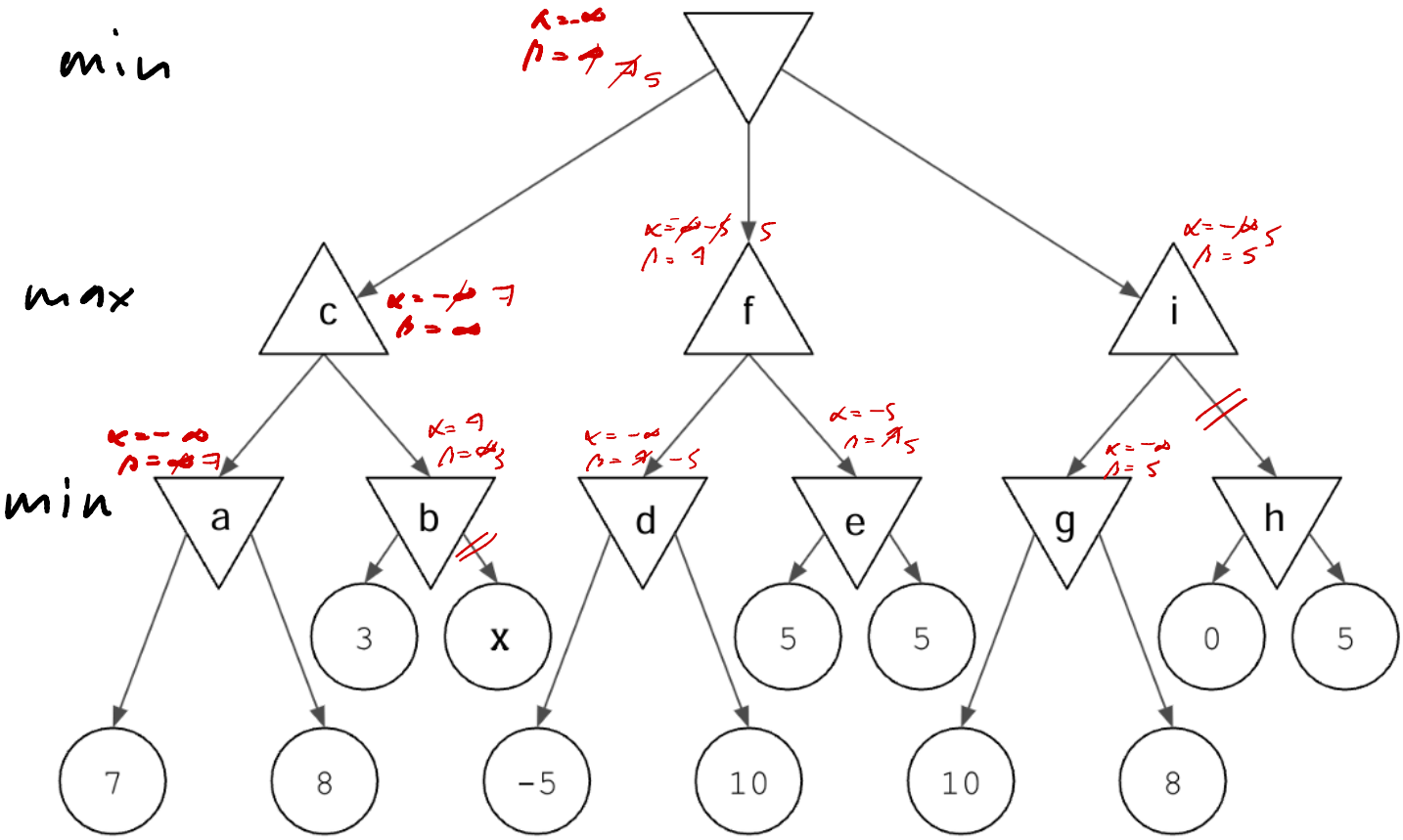
D Yes, if $-5 < x < 1$

No, because max will always choose right because guaranteed positive.

Question 8

3 Points

Use Alpha-Beta Pruning to Solve the following problem. Report the nodes that the algorithm will **NOT** visit. An upper triangle represents a maximizer while a lower triangle represents a minimizer.



- **A** b, x, and h
- **B** x, e, and g
- **C** x and h
- **D** x and i

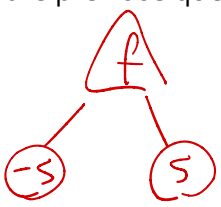
Question 9

3 Points

What is the value obtained at node **f** in the previous question?

5

Integer, decimal, or E notation allowed



Question 10

3 Points

What do the alpha and beta values represent in Alpha-Beta pruning?

A Alpha is the best already explored option for the maximizer; beta is the best for the minimizer.

B Alpha is used only for maximizer moves; beta is only for minimizer moves.

C Alpha represents the average of all explored nodes; beta is the count of leaf nodes.

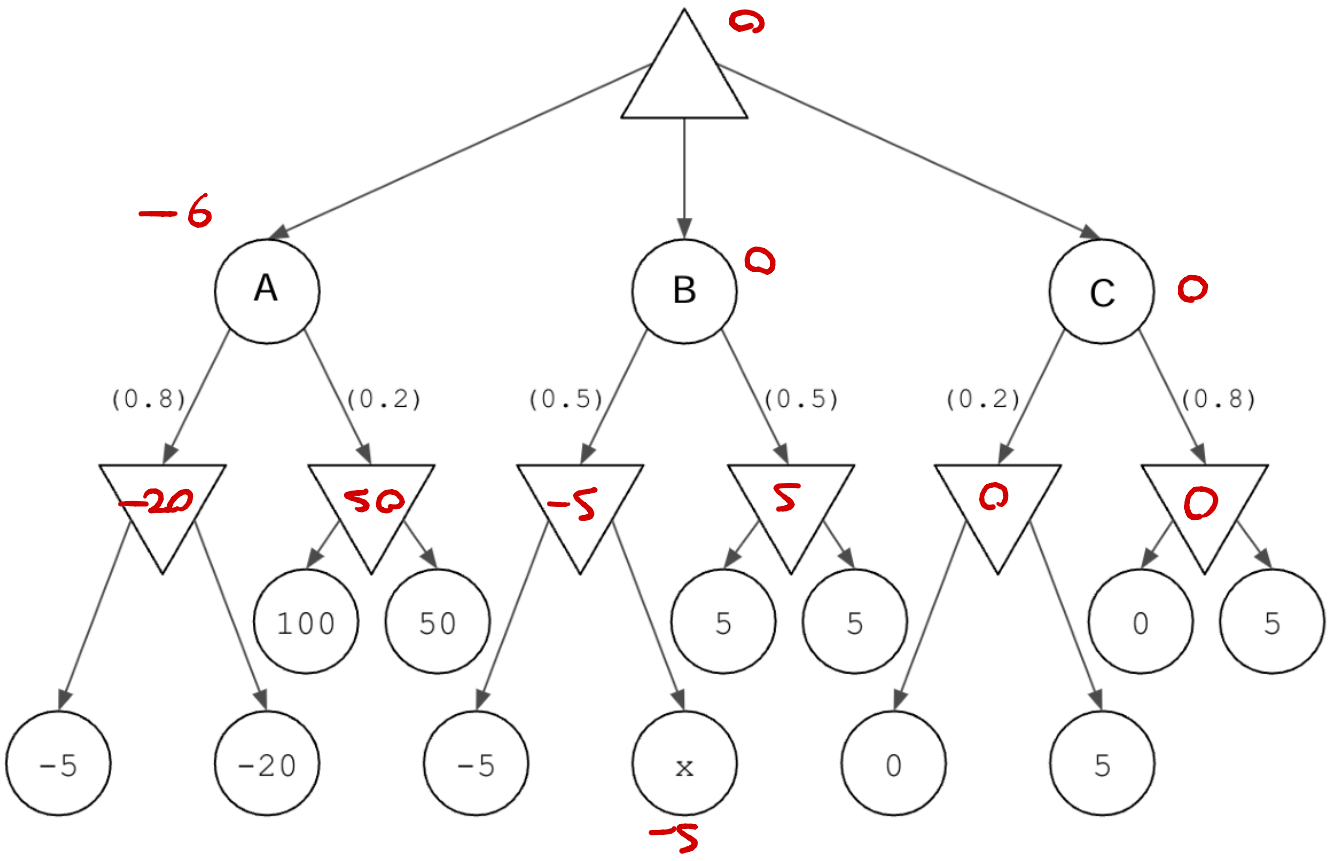
D Alpha is the maximum utility; beta is the minimum utility regardless of the player.

Question 11

8 Points

Use Expectimax algorithm to solve the following problem. The values between brackets represent the probability at the respective link. An upper triangle represents a maximizer while a lower triangle represents a minimizer. Assume that $x = -5$. Report the values at A, B, C, and the outcome of the game (the value at the root node).

A = **-6**, B = **0**, C = **0**, outcome = **0**



Blank 1 -6

Blank 2 0

Blank 3 0

Blank 4 0

Question 12

3 Points

What improvement does Expectimax offer over the traditional Minimax approach in AI games?

A It considers the expected utility based on the probability of various outcomes.

B It uses a simpler scoring system without probabilities.

C It eliminates the need for evaluating terminal states.

D It allows a single player to simulate multiple opponents at once.

Question 13

3 Points

What does a cut-off test replace in the Minimax algorithm for approximation?

A All nodes are evaluated until the terminal states are reached.

B The need for tree traversal is removed entirely.

C The total number of players is reduced to one.

D The terminal state test is replaced with a heuristic evaluation function.

Additional content

Drag and drop files here or click to add text.

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