MIT SCHOOL OF ENGINEERING

Rajbaug, Loni-Kalbhor, Pune

MIT-ADT UNIVERSITY
PUNE, INDIA
A leap towards World Class Education

Name: Safir Motiwala Class: IT TY Batch: 13

Subject: A. I. Roll No.: 2175052 Exp. No.: 02

Name of the Experiment:

Performed on:

Submitted on:

Marks	Teacher's Signature with date
10	

Q1. For 3x3 game of Tic-tac-toe problem.

Ans.

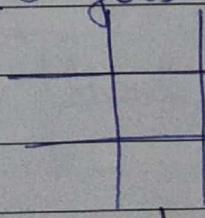
Heuristic function h(n) = chances of X's for Wining - chances of O's for wining.

h(n) = X's possibility to win - O's possibility to win.

h(n) = 0 → draw

h(n) = 1 → win.

X's first move

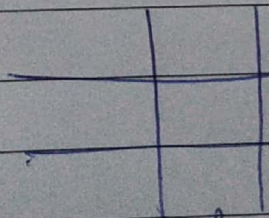


→ X has 8 possible win paths

→ O has 5 possible win paths

h(n) = 8 - 5 = 3

↓ n(n) = |3 - 0| = 3



→ X has 5 possible win paths

→ O has 5 possible win paths

h(n) = |5 - 5| = 0

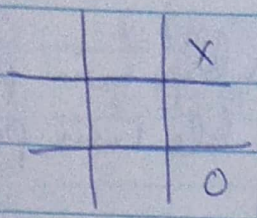
O's first move

Incomplete for Theory ☐ Diagrams ☐ Observation Table ☐

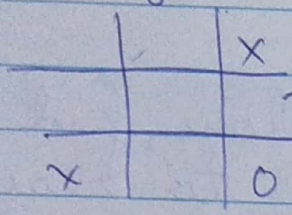
Calculations ☐ Graphs ☐ Results ☐ Conclusion ☐

Understanding Through Q/A ☐ Late Submission ☐ Neatness ☐

Teacher's Signature



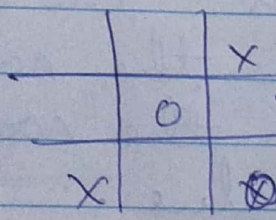
$m(n) = |0-2| = 2$



→ x has 5 possible win paths
→ O has 3 possible win paths
$h(n) = 5-3 = 2.$

X's second move

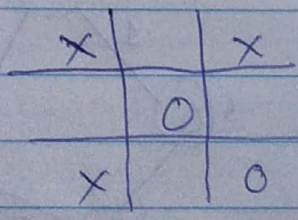
$m(n) = |2-(-1)| = 3$



→ x has 2 possible win paths
→ O has 3 possible win paths
$h(n) = 2-3 = -1.$

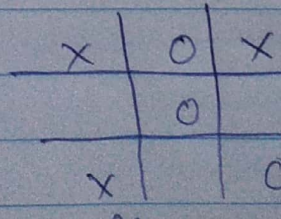
O's second move

$m(n) = |-1-0| = 1$



→ x has 2 possible win paths
→ O has 2 possible win path.
$h(n) = 2-2 = 0.$

X's third move



→ x has 1 possible win path
→ O has 2 possible win path.
$h(n) = 1-2 = -1$

O's third move

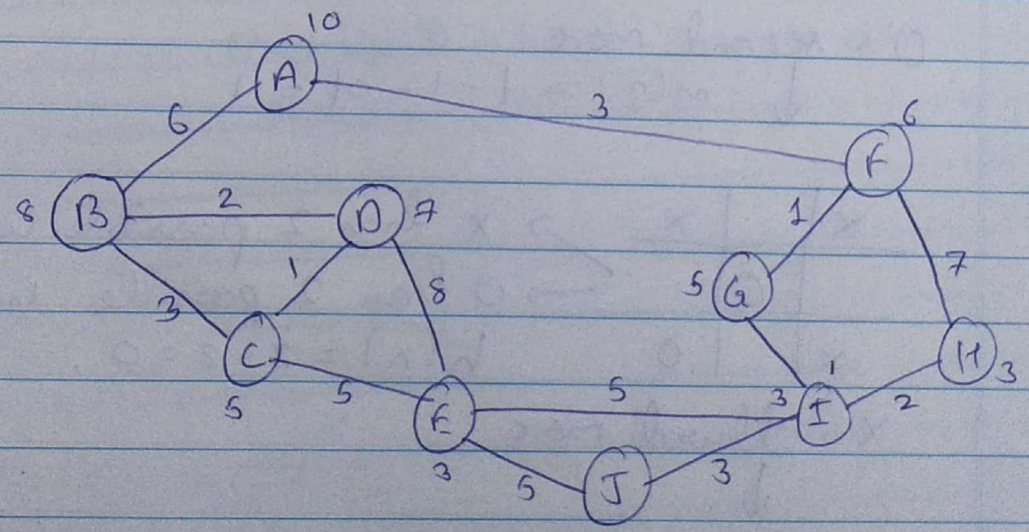
$m(n) = |-1-(-1)| = 2.$

X	O	X
X	O	
X		O

→ X has 1 possible win path
→ O has 0 possible win path
h(n) = 1 - 0 = 1

X's fourth more. Ans. X wins the game.

Q2. In the graph given below, find the most cost effective path to reach from start ~~node~~ state A to final state J. Using A* Algorithm. The number written on the edge represent the distance b/w the nodes. The numbers written on the node represent the heuristic value.



→ f(n) = G(n) + h(n)

for A → A.

① f(A) = 0 + 10
f(A) = 10

② $f(AB)$ $A \rightarrow B$

$f(AB) = 6 + 8 = \boxed{14}$

$A \rightarrow F$

$F(AF) = 3 + 6 = \boxed{9}$

③ $A \rightarrow F \rightarrow G$

$F(AFG) = 4 + 5 = \boxed{9}$

④ $A \rightarrow F \rightarrow G \rightarrow I$

$F(AFGI) = 7 + 1 = \boxed{8}$

$A \rightarrow F \rightarrow G \rightarrow H$

$F(AFGH) = 10 + 3 = \boxed{13}$

⑤ $A \rightarrow F \rightarrow G \rightarrow I \rightarrow J$

$F(AFGIJ) = 10 + 10$

$\boxed{AFGIJ = 10}$

Min cost = 10.

route = AFGIJ