OKAGBUE ONYEKA FRANCIS
CMPT 317
11279373
ASSIGNMENT 6
MARCH 7TH 2023

QUESTION 3

Algorithm	Depth Limit	Time (sec)
Minimax	1	0.0024
Minimax	2	0.0122
Minimax	3	0.0788
Minimax	4	0.5675
Minimax	5	3.3394
Minimax	6	23.3670
Minimax	7	119.6476
Minimax	8	751.0954
Minimax	9	3756.8482
Alphabet	1	0.0005
Alphabet	2	0.0022
Alphabet	3	0.0070
Alphabet	4	0.0386
Alphabet	5	0.1391
Alphabet	6	0.1889
Alphabet	7	0.5325
Alphabet	8	1.3520
Alphabet	9	3.9077

Below is a walkthrough of the game when I played as side L → human to play as Mega Man And I used the highest depth limit from my table when playing this game. I used side L and depth limit of 9.

Summary: Dr Wily (player 2) defeated my previous Mega Man and still had the following life points Flash Man: 30, Gamma: 47. Dr wily won the mega man battle Arena.

Dr. Light's Turn: Send a champion!
****

Light Robot Roster:
Mega Man: 30, Spark Man: 30, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons:
****

Awaiting champion...

VS!!!!!

Awaiting champion...
****

Wily Robot Roster:
Bubble Man: 30, Air Man: 30, Quick Man: 30, Heat Man: 30, Wood Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Mega Man)
Your move: Mega Man
Thinking...
...done
Chose move <Bubble Man> with Minimax value 1 after 1.5276 seconds, expanding 34321 nodes

Dr. Light's Turn: Send a champion!
****

Light Robot Roster:
Mega Man: 5, Spark Man: 30, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Bubble Man
****

Mega Man 5

VS!!!!!

Bubble Man 0
****

Wily Robot Roster:
Air Man: 30, Quick Man: 30, Heat Man: 30, Wood Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Mega Man)
Your move: Mega Man
Thinking...

...done
Chose move <Air Man> with Minimax value 1 after 1.1139 seconds, expanding 29361 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Spark Man: 30, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Mega Man 0

VS!!!!!

Air Man 10
****
Wily Robot Roster:
Air Man: 10, Quick Man: 30, Heat Man: 30, Wood Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Spark Man)
Your move: Spark Man
Thinking...
...done
Chose move <Quick Man> with Minimax value 1 after 0.3951 seconds, expanding 11928 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Spark Man 0

VS!!!!!

Quick Man 18
****
Wily Robot Roster:
Quick Man: 18, Heat Man: 30, Wood Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Snake Man)

Your move: Magnet Man
Thinking...
...done
Chose move <Heat Man> with Minimax value 1 after 0.1428 seconds, expanding 4681 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Shadow Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Magnet Man 0

VS!!!!!

Heat Man 24
****
Wily Robot Roster:
Heat Man: 24, Wood Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Snake Man)
Your move: Needle Man
Thinking...
...done
Chose move <Wood Man> with Minimax value 1 after 0.1128 seconds, expanding 3105 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Snake Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Shadow Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Needle Man 0

VS!!!!!

Wood Man 18
****
Wily Robot Roster:
Wood Man: 18, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Snake Man)
Your move: Shadow Man
Thinking...

...done
Chose move <Crash Man> with Minimax value -1 after 0.0259 seconds, expanding 592 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Snake Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Shadow Man 0

VS!!!!!

Crash Man 24
****
Wily Robot Roster:
Metal Man: 30, Flash Man: 30, Crash Man: 24, Gamma: 99

Human turn! Type a move (example: Snake Man)
Your move: Bubble Man
Invalid move format
Your move: Top Man
Thinking...
...done
Chose move <Metal Man> with Minimax value -2 after 0.0031 seconds, expanding 73 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Snake Man: 30, Hard Man: 30, Gemini Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Top Man 0

VS!!!!!

Metal Man 21
****
Wily Robot Roster:
Metal Man: 21, Flash Man: 30, Gamma: 99

Human turn! Type a move (example: Snake Man)
Your move: Snake Man
Thinking...

...done
Chose move <Metal Man> with Minimax value -2 after 0.0012 seconds, expanding 27 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Hard Man: 30, Gemini Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Snake Man 0

VS!!!!!

Metal Man 6
****
Wily Robot Roster:
Metal Man: 6, Flash Man: 30, Gamma: 99

Human turn! Type a move (example: Hard Man)
Your move: Hard Man
Thinking...
...done
Chose move <Gamma> with Minimax value -2 after 0.0004 seconds, expanding 5 nodes

Dr. Light's Turn: Send a champion!
****
Light Robot Roster:
Gemini Man: 30
Mega Man's weapons: Bubble Man, Bubble Man
****
Hard Man 0

VS!!!!!

Gamma 47
****
Wily Robot Roster:
Flash Man: 30, Gamma: 47

Human turn! Type a move (example: Gemini Man)
Your move: Gemini Man
Thinking...
...done
Chose move <Flash Man> with Minimax value -2 after 0.0001 seconds, expanding 1 nodes

Process finished with exit code 0

**Below is a walkthrough of the game when I played as side W → human to play as Dr Wily
And I used the highest depth limit from my table when playing this game. I used side W and a depth limit of 9.**

**Summary: Mega Man (player 1) defeated Dr Wily and still had the following life points:
Mega Man: 26, Spark Man: 14, Snake Man: 30, Needle Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30.**

Thinking...
...done
Chose move <Mega Man> with Minimax value 0 after 3.3543 seconds, expanding 94007 nodes

Dr. Wily's Turn: Send a champion!
****
Light Robot Roster:
Mega Man: 30, Spark Man: 30, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons:
****
Mega Man 30

VS!!!!!

Awaiting champion...
****
Wily Robot Roster:
Bubble Man: 30, Air Man: 30, Quick Man: 30, Heat Man: 30, Wood Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Bubble Man)
Your move: Air Man
Thinking...
...done
Chose move <Mega Man> with Minimax value 0 after 3.0019 seconds, expanding 99353 nodes

Dr. Wily's Turn: Send a champion!
****
Light Robot Roster:

Mega Man: 25, Spark Man: 30, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Air Man, Air Man
****

Mega Man 25

VS!!!!!

Air Man 0
****
Wily Robot Roster:
Bubble Man: 30, Quick Man: 30, Heat Man: 30, Wood Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Bubble Man)
Your move: Wood Man
Thinking...
...done
Chose move <Mega Man> with Minimax value 1 after 3.7070 seconds, expanding 122861 nodes

Dr. Wily's Turn: Send a champion!
****
Light Robot Roster:
Mega Man: 27, Spark Man: 30, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Air Man, Air Man, Wood Man, Wood Man
****

Mega Man 27

VS!!!!!

Wood Man 0
****
Wily Robot Roster:
Bubble Man: 30, Quick Man: 30, Heat Man: 30, Metal Man: 30, Flash Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Bubble Man)
Your move: Flash Man
Thinking...
...done
Chose move <Spark Man> with Minimax value 3 after 2.1437 seconds, expanding 73258 nodes

Dr. Wily's Turn: Send a champion!
****

Light Robot Roster:

Mega Man: 17, Spark Man: 30, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30

Mega Man's weapons: Air Man, Air Man, Wood Man, Wood Man, Flash Man
****

Spark Man 30

VS!!!!!

Flash Man 0
****

Wily Robot Roster:

Bubble Man: 30, Quick Man: 30, Heat Man: 30, Metal Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Bubble Man)
Your move: Bubble Man
Thinking...
...done
Chose move <Hard Man> with Minimax value 5 after 1.8933 seconds, expanding 68974 nodes

Dr. Wily's Turn: Send a champion!
****

Light Robot Roster:

Mega Man: 17, Spark Man: 14, Snake Man: 30, Needle Man: 30, Hard Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30

Mega Man's weapons: Air Man, Air Man, Wood Man, Wood Man, Flash Man
****

Hard Man 30

VS!!!!!

Bubble Man 0
****

Wily Robot Roster:

Quick Man: 30, Heat Man: 30, Metal Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Quick Man)
Your move: Heat Man
Thinking...
...done
Chose move <Mega Man> with Minimax value 6 after 0.5116 seconds, expanding 17644 nodes

Dr. Wily's Turn: Send a champion!
****

Light Robot Roster:
Mega Man: 22, Spark Man: 14, Snake Man: 30, Needle Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Air Man, Air Man, Wood Man, Wood Man, Flash Man, Heat Man
****

Mega Man 22

VS!!!!!

Heat Man 0
****

Wily Robot Roster:
Quick Man: 30, Metal Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Quick Man)
Your move: Metal Man
Thinking...
...done
Chose move <Mega Man> with Minimax value 6 after 0.4102 seconds, expanding 13827 nodes

Dr. Wily's Turn: Send a champion!
****

Light Robot Roster:
Mega Man: 17, Spark Man: 14, Snake Man: 30, Needle Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Air Man, Air Man, Wood Man, Wood Man, Flash Man, Heat Man, Metal Man, Metal Man
****

Mega Man 17

VS!!!!!

Metal Man 0
****

Wily Robot Roster:
Quick Man: 30, Crash Man: 30, Gamma: 99

Human turn! Type a move (example: Quick Man)
Your move: Crash Man
Thinking...
...done
Chose move <Mega Man> with Minimax value 6 after 0.1900 seconds, expanding 5428 nodes

Dr. Wily's Turn: Send a champion!
****
Light Robot Roster:
Mega Man: 24, Spark Man: 14, Snake Man: 30, Needle Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Air Man, Air Man, Wood Man, Wood Man, Flash Man, Heat Man, Metal Man, Metal Man, Crash Man, Crash Man
****
Mega Man 24

VS!!!!!

Crash Man 0
****
Wily Robot Roster:
Quick Man: 30, Gamma: 99

Human turn! Type a move (example: Quick Man)
Your move: Quick Man
Thinking...
...done
Chose move <Top Man> with Minimax value 8 after 0.0357 seconds, expanding 605 nodes

Dr. Wily's Turn: Send a champion!
****
Light Robot Roster:
Mega Man: 26, Spark Man: 14, Snake Man: 30, Needle Man: 30, Top Man: 30, Gemini Man: 30, Magnet Man: 30, Shadow Man: 30
Mega Man's weapons: Air Man, Air Man, Wood Man, Wood Man, Flash Man, Heat Man, Metal Man, Metal Man, Crash Man, Crash Man, Quick Man
****
Top Man 30

VS!!!!!

Quick Man 0
****
Wily Robot Roster:
Gamma: 99

Human turn! Type a move (example: Gamma)
Your move: Gamma
Thinking...

...done
Chose move <Mega Man> with Minimax value 8 after 0.0004 seconds, expanding 1 nodes

Process finished with exit code 0