NTNU

Assignment 2

Introduksjon til Kunstig Intelligens

Aditi Ravi Deshpande

October 20, 2025

Contents

1	Halving game			
	1.1 Results	3		
2	Bucket game			

	2.1	Results	٠
3	Tic-	tac-toe	4
	3.1	Time taken for first move	4
	3.2	Results	4

1 Halving game

1.1 Results

```
> python .\halving_game.py
The number is 5 and it is P1's turn
P1's action: --
The number is 4 and it is P2's turn
P2's action: --
The number is 3 and it is P1's turn
P1's action: /2
The number is 1 and it is P2's turn
P2's action: --
The number is 0 and P1 won
```

Figure 1: Result halving game

2 Bucket game

2.1 Results

```
> python .\bucket_game.py
The state is (0, ['A', 'B', 'C']) and it is P1's turn
P1's action: B
The state is (1, [3, 1]) and it is P2's turn
P2's action: 1
The state is (0, [1]) and P1's utility is 1
```

Figure 2: Result bucket game

3 Tic-tac-toe

3.1 Time taken for first move

```
> python .\tic_tac_toe.py

=== Tic-tac-toe first move timing comparison ===

Minimax first move: (0, 0), time = 9.389368 seconds

Alpha-Beta first move: (0, 0), time = 0.357086 seconds
```

Figure 3: Time taken for first move

3.2 Results

Read from up to down

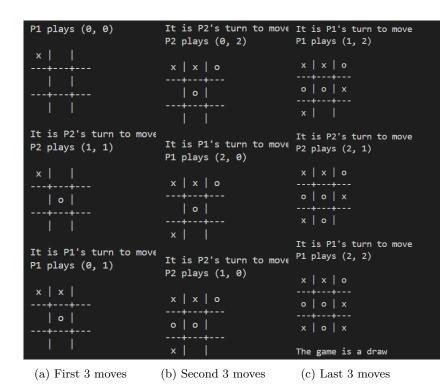


Figure 4: Tic tac toe moves

References