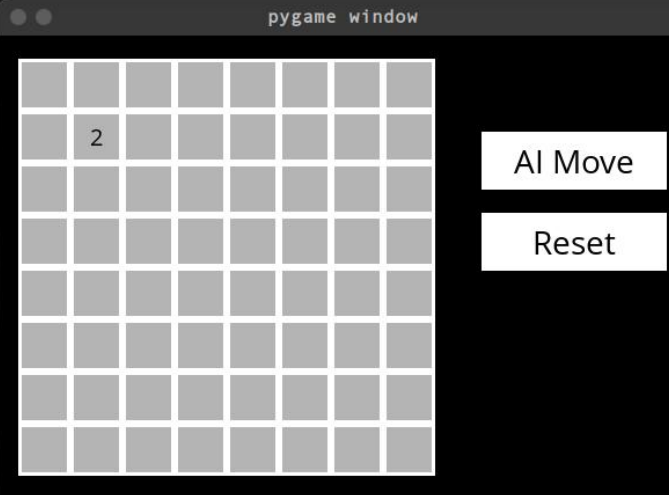


Initial State : Selecting random cell at Index (1,1)

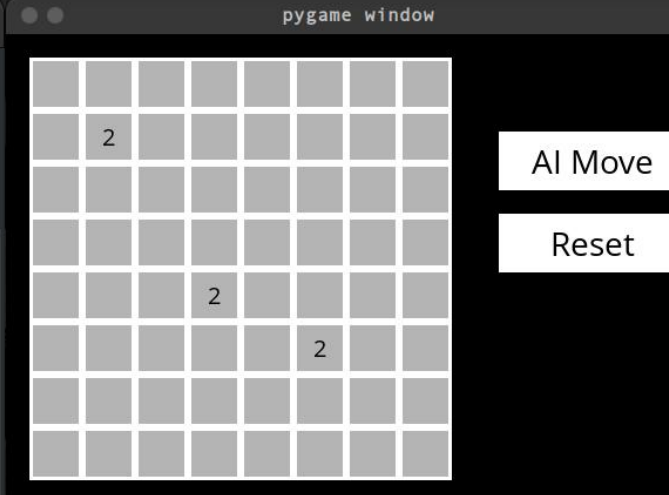
```
vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...  
vaibhav@vaibhav-garje:~/Videos/cs50ai-week1-minesweeper$ python3 runner.py  
pygame 2.1.2 (SDL 2.0.16, Python 3.10.6)  
Hello from the pygame community. https://www.pygame.org/contribute.html  
AI Selecting Random Move With Basic Probability: (1, 1)  
No known safe moves, AI making random move.  
Move on cell: (1, 1) has added sentence to knowledge {(0, 1), (1, 2), (2, 1), (0, 0), (2, 0), (0, 2), (2, 2), (1, 0)} = 2  
Current AI KB length: 1  
Known Mines: set()  
Safe Moves Remaining: set()  
=====
```



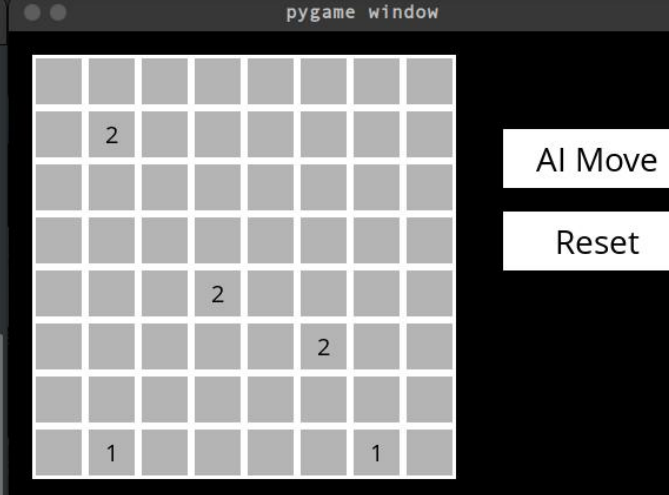
In above we have added to KB that exactly two cells around mine(1,1) has mine on each.

Using KB we know cell(1,1) has 2 mines around it so selecting another random cell with lowest known mine probability

```
vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...  
=====  
AI Selecting Random Move with lowest mine probability using KB: (5, 5)  
)  
No known safe moves, AI making random move.  
Move on cell: (5, 5) has added sentence to knowledge {(4, 4), (6, 5), (5, 4), (4, 6), (6, 4), (4, 5), (5, 6), (6, 6)} = 2  
Current AI KB length: 2  
Known Mines: set()  
Safe Moves Remaining: set()  
=====  
AI Selecting Random Move with lowest mine probability using KB: (4, 3)  
)  
No known safe moves, AI making random move.  
Move on cell: (4, 3) has added sentence to knowledge {(4, 4), (3, 4), (5, 4), (4, 2), (3, 3), (5, 3), (3, 2), (5, 2)} = 2  
Current AI KB length: 3  
Known Mines: set()  
Safe Moves Remaining: set()  
=====
```



```
vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...  
=====  
AI Selecting Random Move with lowest mine probability using KB: (7, 1)  
)  
No known safe moves, AI making random move.  
Move on cell: (7, 1) has added sentence to knowledge {(6, 2), (6, 1), (7, 0), (7, 2), (6, 0)} = 1  
Current AI KB length: 4  
Known Mines: set()  
Safe Moves Remaining: set()  
=====  
AI Selecting Random Move with lowest mine probability using KB: (7, 6)  
)  
No known safe moves, AI making random move.  
Move on cell: (7, 6) has added sentence to knowledge {(7, 7), (6, 5), (6, 7), (6, 6), (7, 5)} = 1  
Current AI KB length: 5  
Known Mines: set()  
Safe Moves Remaining: set()  
=====
```



Using knowledge base we have identified safe cells and making move.

vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...
=====
AI Selecting Random Move with lowest mine probability using KB: (4, 0)
No known safe moves, AI making random move.
Move on cell: (4, 0) has added sentence to knowledge {(3, 1), (5, 1), (3, 0), (5, 0), (4, 1)} = 0
Current AI KB length: 5
Known Mines: set()
Safe Moves Remaining: {(3, 1), (5, 1), (3, 0), (5, 0), (4, 1)}
=====
Making a Safe Move! Safe moves available: 5
AI making safe move.
Move on cell: (3, 1) has added sentence to knowledge {(2, 1), (2, 0), (4, 2), (2, 2), (3, 2)} = 0
Current AI KB length: 5
Known Mines: set()
Safe Moves Remaining: {(2, 1), (2, 0), (5, 1), (4, 2), (3, 0), (5, 0), (2, 2), (3, 2), (4, 1)}
=====

	2						
	0						
0			2				
					2		
	1					1	

AI Move
Reset

vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...
=====
, (2, 2), (3, 2), (4, 1)}
=====
Making a Safe Move! Safe moves available: 9
AI making safe move.
Move on cell: (4, 1) has added sentence to knowledge {(5, 2)} = 0
Current AI KB length: 5
Known Mines: set()
Safe Moves Remaining: {(2, 1), (2, 0), (5, 1), (4, 2), (3, 0), (5, 0), (2, 2), (3, 2), (5, 2)}
=====
Making a Safe Move! Safe moves available: 9
AI making safe move.
Move on cell: (5, 2) has added sentence to knowledge {(5, 3), (6, 1), (6, 2), (6, 3)} = 1
Current AI KB length: 6
Known Mines: set()
Safe Moves Remaining: {(2, 1), (2, 0), (5, 1), (4, 2), (3, 0), (5, 0), (2, 2), (3, 2)}
=====

	2						
	0						
0	0		2				
		1			2		
	1					1	

AI Move
Reset

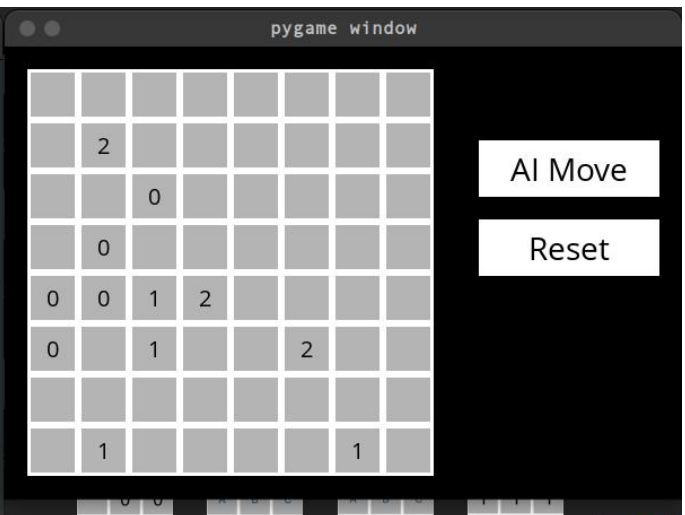
vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...
=====
Making a Safe Move! Safe moves available: 8
AI making safe move.
Move on cell: (4, 2) has added sentence to knowledge {(5, 3), (3, 3)} = 1
New Inferred Knowledge: {(4, 4), (5, 4), (3, 4)} = 1 from {(5, 3), (3, 3)} = 1 and {(4, 4), (3, 4), (5, 4), (3, 3), (5, 3)} = 2
Current AI KB length: 8
Known Mines: set()
Safe Moves Remaining: {(2, 1), (2, 0), (5, 1), (3, 0), (5, 0), (2, 2), (3, 2)}
=====
Making a Safe Move! Safe moves available: 7
AI making safe move.
Move on cell: (5, 0) has added sentence to knowledge {(6, 1), (6, 0)} = 0
Current AI KB length: 8
Known Mines: set()
Safe Moves Remaining: {(6, 0), (2, 1), (6, 1), (2, 0), (5, 1), (3, 0), (2, 2), (3, 2)}
=====

	2						
	0						
0	0	1	2				
0		1			2		
	1					1	

AI Move
Reset

Using knowledge base a mine has been identified at (5,3) and flagged.

```
vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...  
Move on cell: (5, 0) has added sentence to knowledge {(6, 1), (6, 0)}  
= 0  
Current AI KB length: 8  
Known Mines: set()  
Safe Moves Remaining: {(6, 0), (2, 1), (6, 1), (2, 0), (5, 1), (3, 0),  
(2, 2), (3, 2)}  
=====  
Making a Safe Move! Safe moves available: 8  
AI making safe move.  
Move on cell: (2, 2) has added sentence to knowledge {(2, 3), (1, 2),  
(1, 3), (3, 3)} = 0  
New Inferred Knowledge: {(6, 2), (6, 3)} = 0 from {(5, 3)} = 1 and  
{(5, 3), (6, 2), (6, 3)} = 1  
Mine Identified! - {(5, 3)}  
Current AI KB length: 6  
Known Mines: {(5, 3)}  
Safe Moves Remaining: {(6, 2), (1, 2), (2, 1), (6, 1), (2, 0), (5, 1),  
(3, 0), (2, 3), (3, 3), (6, 0), (3, 2), (6, 3), (1, 3)}  
=====
```



All Mines Have been Identified [End] of the game.

```
vaibhav@vaibhav-garje: ~/Videos/cs50ai-week1-mines...  
(5, 3)}  
Safe Moves Remaining: {(1, 6), (0, 0)}  
=====  
Making a Safe Move! Safe moves available: 2  
AI making safe move.  
Move on cell: (0, 0) has added sentence to knowledge set() = 0  
Current AI KB length: 0  
Known Mines: {(0, 1), (6, 5), (3, 7), (5, 4), (1, 0), (7, 2), (0, 5),  
(5, 3)}  
Safe Moves Remaining: {(1, 6)}  
=====  
Making a Safe Move! Safe moves available: 1  
AI making safe move.  
Move on cell: (1, 6) has added sentence to knowledge set() = 0  
Current AI KB length: 0  
Known Mines: {(0, 1), (6, 5), (3, 7), (5, 4), (1, 0), (7, 2), (0, 5),  
(5, 3)}  
Safe Moves Remaining: set()  
=====  
No moves left to make.
```

