

### Problem statement 1 : Gaming

**Two-player Solution-Based Crossword Puzzle:** This crossword puzzle is a two-player game where the points are awarded based on the character count in the word (Cat gets 3 points). The player must choose one of the words given and correctly place it in the grid (For example, 5D is Rabbit, 6A is cat ). If the player places it in the wrong grid, then one point is deducted and the other player has to place it in the grid till the right grid is found. The game continues till all the words are placed correctly. Do not use Random seed and select two best solutions after 10 iterations. Print the final variable-value details.

#	#	#	#	R	#	#	#	#
#	#	#	#	A	#	#	#	#
#	#	#	#	B	#	#	#	#
#	#	#	#	B	#	#	#	#
H	#	#	#	I	#	#	#	#
O	#	C	A	T	#	#	#	#
R	#	A	#	#	#	D	O	G
S	#	M	#	#	#	O	#	#
E	L	E	P	H	A	N	T	#
#	#	L	#	#	#	K	#	#
#	#	#	#	#	#	E	#	#
#	M	O	N	K	E	Y	#	#

### Problem statement 2: Logic

The Pragyan Rover from Chandrayan 3 must make decisions for measuring certain parameters from the moon (c0 or c1) and data comes from 10 sensors (Dataset attached). Use the below decision tree and create Prolog rules to predict which parameter to measure for the given condition. Take the attribute values from the user by giving suitable user prompts and predict the class

a5 = false: c0 (44.0/2.0)

a5 = true

| a8 = false

| | a9 = false

| | | a2 = false: c0 (4.0/1.0)

| | | a2 = true

| | | | a0 = false

| | | | | a4 = false: c1 (2.0)

| | | | | a4 = true: c0 (2.0)

| | | | a0 = true: c1 (5.0)

| | a9 = true: c1 (15.0/1.0)

| a8 = true

| | a1 = false  
| | | a2 = false  
| | | | a0 = false: c1 (4.0/1.0)  
| | | | a0 = true: c0 (3.0)  
| | | a2 = true  
| | | | a4 = false: c1 (5.0)  
| | | | a4 = true: c0 (2.0)  
| | a1 = true: c0 (14.0/2.0)

Dataset: See OurLogic.csv file in folder

**Implement following:**

1. Use Min-Max algorithm and implement the game in PYTHON
2. Derive the rules from the given decision tree and code as Prolog rules.
3. Interactive implementation. Dynamic inputs-based run of the game with step wise board display and error free game ending.
4. Interactive implementation. Dynamic inputs-based run of the logic expert system with step wise options display and error free recommendation & ending.