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# ASSIGNMENT 1

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MACHINE LEARNING

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# Bird Recognition

Data:



Input:

- Images

Output

- Bird or not a bird.

Attributes:

- Feathers:- “Yes” or “No”
- Claws:- “Yes” or “No”
- Flight:- “Yes” or “No”

Instance Space:

In bird recognition concept:

- Attributes:- Feather, Claws, and Flight.
- Each attribute has two possible values.
- The size of Instance space would be,  $|X| = 2*2*2 = 8$

X	Feathers	Claws	Flight	Bird
X1	Yes	Yes	Yes	-
X2	Yes	Yes	No	-
X3	Yes	No	Yes	-
X4	Yes	No	No	-
X5	No	Yes	Yes	-

X6	No	Yes	No	-
X7	No	No	Yes	-
X8	No	No	No	-

Concept Space:

$$|C| = 2^{|X|}$$

- $|X|$  Represent the size of instance space.
- $|C|$  Represent the size of concept space.

In the bird recognition concept

- $|C| = 2^{|X|} = 2^{|8|} = 256$

X	Feathers	Claws	Flight	Bird
X1	Yes	Yes	Yes	C(1)
X2	Yes	Yes	No	C(2)
X3	Yes	No	Yes	C(3)
X4	Yes	No	No	C(4)
X5	No	Yes	Yes	C(5)
X6	No	Yes	No	C(6)
X7	No	No	Yes	C(7)
X8	No	No	No	C(8)

0	0	0	0
0	0	0	0

1	0	0	0
0	0	0	0

0	0	1	0
0	0	0	0

0	0	0	0
0	1	0	0

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1	1	1	1
1	1	1	1