Explanation based Learning

- Explanation based learning has ability to learn from a single training instance. Instead of taking more examples the explanation based learning is emphasized to learn a single, specific example.

- For example, consider the Ludoo game. In a Ludoo game, there are generally four colors of buttons. For a single color there are four different squares.

- Suppose the colors are red, green, blue and yellow. So maximum four members are possible for this game.

- Two members are considered for one side (suppose green and red) and other two are considered for another side (suppose blue and yellow).

- So for any one opponent the other will play his game. A square sized small box marked by symbols one to six is circulated among the four members.

Cont…

- The number one is the lowest number and the number six is the highest for which all the operations are done.

- Always any one from the 1st side will try to attack any one member in the 2nd side and vice versa.

- At any instance of play the players of one side can attack towards the players of another side.

- Likewise, all the buttons may be attacked and rejected one by one and finally one side will win the game.

- Here at a time the players of one side can attack towards the players of another side.

- So for a specific player, the whole game may be affected. Hence we can say that always explanation based learning is concentrated on the inputs like a simple learning program, the idea about the goal state, the idea about the usable concepts and a set of rules that describes relationships between the objects and the actions.

Cont…

- Consider the problem of learning the concept bucket. We want to generalize from a single example of a bucket. At first collect the following informations.

1. **Input Examples:**

   Owner (object, X) ∧ has part (object, Y) ∧ is(object, Deep) ∧ Color (Object, Green)

   ∧ … … (Where Y is any thin material)

2. **Domain Knowledge:**

   is (a, Deep) ∧ has part (a, b) ∧ is a(b, handle) → liftable (a)

   has part (a, b) ∧ is a (b, Bottom) ∧ is (b, flat) → Stable (a)

   has part (a, b) ∧ is a (b, Y) ∧ is (b, Upward − pointing) → Open − vessel (a)

Cont…

3. **Goal:** Bucket

B is a bucket if B is liftable, stable and open-vessel.

4. Description of Concept: These are expressed in purely structural forms like Deep, Flat, rounded etc.

Cont…

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Bucket (Object)

Liftable (object)   Stable (object)   Open vessel (Object)

is (Object, Deep)
has — part (Object, Handle)
is a (Handle)

has part (Object, Y)
is a (Y)
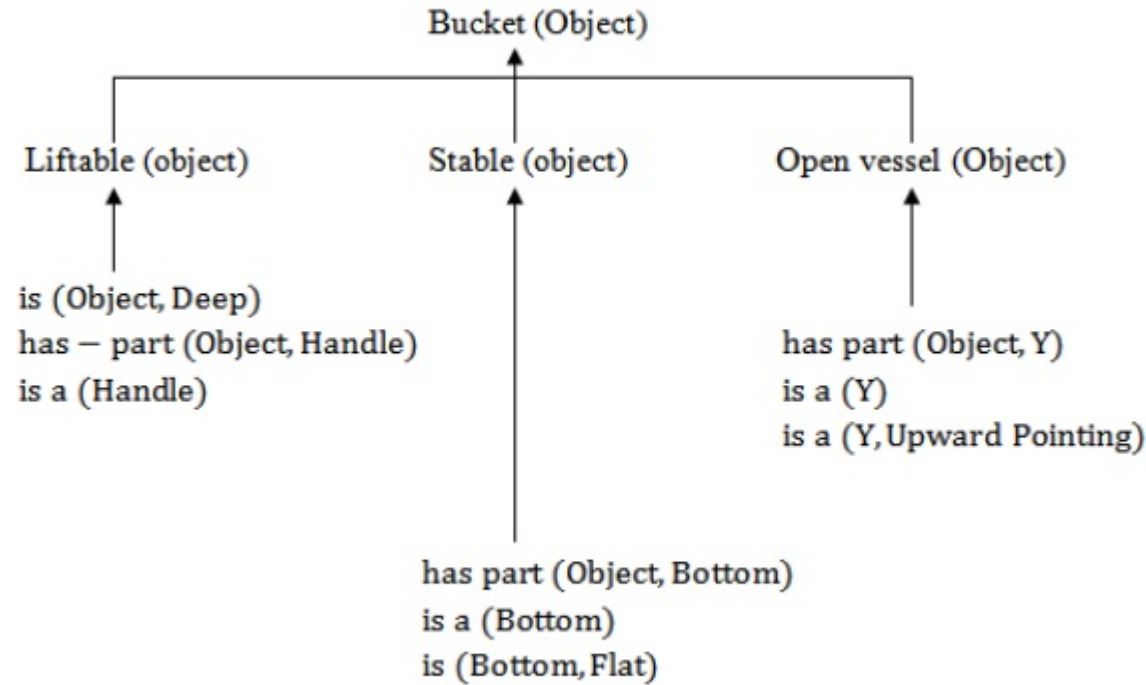is a (Y, Upward Pointing)

has part (Object, Bottom)
is a (Bottom)
is (Bottom, Flat)

Figure An explanation of BUCKET Object