AI & ML

Question Bank-Module-2(ML Part)

1. What is concept learning? Briefly explain a concept learning task.
2. Describe the find-s algorithm. Explain its working taking the enjoy sport concept and training instances given below

Eg	Sky	Airtemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Sunny	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Warm	Change	Yes

3. Given below the attributes for the EnjoySport learning task, Calculate the total number of instances X, the syntactically distinct hypothesis space H and the semantically distinct hypothesis H.

Attributes	Values
Sky	Sunny/cloudy/Rainy
Air Temperature	Warm/cold
Humidity	Normal/High
Wind	Strong/weak
Water	Warm/cool
Forecast	Same/change
WaterCurrent	Light/Moderate/Strong

4. What are the drawbacks of FIND-S.

5. Explain version space with respect to candidate elimination algorithm.

6.Describe list-then-eliminate algorithm.

7.Explain CANDIDATE-ELIMINATION learning algorithm

8. Provide the hand trace of the CANDIDATE-ELIMINATION algorithm learning for the below training examples and the hypothesis language. Show specific and general version space after each training example is processed.

Eg	Sky	Airtemp	Humidity	Wind	Water	Forecast	EnjoySport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes

2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Sunny	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Warm	Change	Yes

9. Consider the following sequence of positive and negative training examples describing the concept "pairs of people who live in the same house".

Each training examples describes an ordered pair of people with each person described by their Sex(male/female),Haircolor(black/brown/blonde),Height(tall/medium/short)and Nationality(US/French/German/Indian/Japanese/Portuguese)

+((male brown tall US) (female black short US))
+((male brown short French) (female black short US))
-((female brown tall German) (female black short Indian))
+((male brown tall Irish) (female brown short Irish))

Consider a Hypothesis space defined over these instances in which each hypothesis is represented by a pair of 4-tuples and where each attribute constraint may be a specific value"?" or " ø".

(i) Provide the hand trace of the CANDIDATE-ELIMINATION algorithm learning from the above training examples and the hypothesis language. Show specific and general version space after each training example is processed.

(ii) How many distinct hypothesis from the given hypothesis space are consistent with the single positive training example +((male black short Portuguese) (female blonde tall Indian))

10. Explain inductive bias of candidate elimination algorithm.