Question Bank with answer

UNIT-03

Machine Learning

What is learning?

Learning covers a wide range of phenomena.At one end of the spectrum

is skill refinement.People get better at many tasks simply by practicing.At

the other end of the spectrum lies knowledge acquisition.Knowledge is

generally acquired through experience.

What are types of learning?

 ROTE learning

 Learning by taking advice

 Learning in problem solving

 Learning from examples

 Explanation based learning

Define Machine learning. [ APR/MAY 2018]

Machine Learning, a branch of artificial intelligence, is about the

construction and study of systems that can learn from data.The core of

machine learning deals with representation and generalization.

Representation of data instances and functions evaluated on these

instances are part of all machine learning systems. Generalization is the

property that the system will perform well on unseen data instances; the

conditions under which this can be guaranteed are a key object of study

in the subfield of computational learning theory

What is Adaptive learning? [NOV/DEC 2017]

Adaptive learning has been partially driven by a realization that tailored

learning cannot be achieved on a large-scale using traditional, non-

adaptive approaches. Adaptive learning systems endeavor to transform

the learner from passive receptor of information to collaborator in the

educational process. Adaptive learning systems' primary application is in

education, but another popular application is business training. They have

been designed as both desktop computer applications and web

applications

What is planning?

Planning refers to the process of computing several steps of a problem

solving procedure before executing any of them.

What are the Fundamental concepts of machine learning?

1. Induction,

2. Generalisation

List out successful applications of machine learning?

 Adaptable software system  Bioinformatics

 Natural language processing  Speech recognition

Pattern recognition

 Intelligent control

 Trend prediction

What is the idea of Concept Learning and Classification?

The idea of concept learning and classification is that given a training set

of positive and negative instances of some concept (which belongs to

some pre-enumerated set of concepts), the task is to generate rules that

classify the training set correctly, and that also ‘recognize’ unseen

instances of that concept, i.e. generalize well. To do this we work with a

set of patterns that describe the concepts, i.e. patterns which state those

properties which are common to all individual instances of each concept.

List the three Core Elements of Adaptive Learning Systems ?

A content model - This refers to the way the specific topic, or content

domain, is structured, with thoroughly detailed learning outcomes and a

definition of tasks that need to be learned.

A learner model -In order to adapt, many adaptive systems make

statistical inferences about the student’s knowledge based on their

performance; they must “model” the learner.

An instructional model - The instructional model determines how a

system selects specific content for a specific student at a specific time

What is Supervised learning ?

The computer is presented with example inputs and their desired outputs,

given by a "teacher", and the goal is to learn a general rule

that maps inputs to outputs.

What is Unsupervised learning?

No labels are given to the learning algorithm, leaving it on its own to

find structure in its input. Unsupervised learning can be a goal in itself

(discovering hidden patterns in data) or a means towards an end (feature

learning).

What is Reinforcement learning?

A computer program interacts with a dynamic environment in which it

must perform a certain goal (such as driving a vehicle), without a teacher

explicitly telling it whether it has come close to its goal. Another example

is learning to play a game by playing against an opponent.

What are Support vector machines?

Support vector machines (SVMs) are a set of related supervised

learning methods used for classification and regression. Given a set of

training examples, each marked as belonging to one of two categories, an

SVM training algorithm builds a model that predicts whether a new

example falls into one category or the other.

What is Clobbering?

A clobberer is a potentially intervening step that destroys the condition

achieved by a causal link.Example Go(Home) clobbers At(Supermarket)

What is Resilience in Planning

After performing a wrong operation, if the system again goes towards the

goal, then it has resilience with respect to that operation.

What is the purpose of learning?

The idea behind learning is that percepts should be used not only for

acting but also for improving the agent’s ability to act in the future.

What are issues in learning element?

i. Component ii. Feedback iii. Representation

What are the types of machine learning?

i. Supervised Learning ii. Unsupervised Learning iii. Reinforcement

Learning

Define Reinforcement Learning.

This Learning is rather than being told what to do by teacher, a

reinforcement learning agent must learn from occasional rewards.

Example If taxi driver does not get a tip at the end of journey, it gives

him a indication that his behaviour is undesirable.

Define Inductive Learning.

An algorithm for supervised learning is given as input the correct value of

the unknown function for particular inputs and it must try to recover the

unknown function.

Define Classification Learning.

Learning a discrete valued function is called is called classification

learning.

What is parity and majority function?

Parity Function : It Returns 1 if and only if an even number of inputs are

1. Majority function : It Returns 1 if more than half of its inputs are 1.

What is training set?

The complete set of examples is called the training set. Example

Restaurant problem Goal predicate “will wait”

Define Information gain.

Information gain from the attribute test is the difference between the

original information requirement and the new requirement. Gain (A) =

I(p/(p+n)), n/ (p+n)) – Remainder(A)

Define Passive learning.

The agent’s policy is fixed and the task is to learn the utilities of states,

this could also involve learning a model of the environment.

Define Active Learning.

The agent must learn what to do. An agent must experience as much as

possible of its environment in order to learn how to behave in it

What is Expert system?

Expert systems are computer programs that are derived from a branch of

computer science research called AI. The programs that achieve expert

level competence in solving problems in task areas by bringing to bear a

body of knowledge about specific tasks are called expert systems or

knowledge base.

What are the most important aspects of expert systems?

The knowledge base

The reasoning or inference engine

What are the characteristics of expert systems?

1. Expert systems use the knowledge rather than data to control the

solution process.

2. The knowledge is encoded and maintained as an entity separate

from the control program.

3. They explain how a particular conclusion was reached.

4. They use symbolic representations for knowledge and perform

their inference through symbolic computation.

5. They often reason with Meta knowledge.

Explain the role of domain expert?

The role of the domain expert is to discover and cumulate the knowledge

of the task domain. The domain knowledge consists of both formal,

textbook knowledge and experimental knowledge.