**1. What is the concept of human learning? Please give two examples.**

- Human learning is a process of acquiring knowledge. Our behavior, skills, values and ethics are acquired when we process information through our minds and learn. Anything leaning from observation or sense is called as human learning.

Examples are – driving where we need to learn, memorizing a particular memory etc.

**2. What is machine learning, and how does it work? What are the key responsibilities of machine learning?**

- Machine learning stands for a process where machine tries to find out the relationship between variables or features which includes the learning parameter in it. The output is combination of prediction which is given to machine as input in the form of data. It is a way for computer programs to improve their performance on a task over time given more data.

**3. Define the terms "penalty" and "reward" in the context of reinforcement learning.**

- In reinforcement learning , the agent is been trained on the basis of the penalty and rewards. Ie it the agent performs or moves as per the training then it been rewarded if it fails to do so then it is been punished. The main purpose is to minimize wrong moves and maximize the right ones

**4. Explain the term "learning as a search"?**

- Searching through a large space of hypotheses implicitly defined by the hypothesis representation.

The hypothesis representation defines the space of hypotheses the program can ever represent and

therefore can ever learn. For example, Sky has 3 possible values and Temp,Humidity,Wind,Water,

and Forecast each have 2 possible values.

**5. Provide an example of the abstraction method.**

- Python itself doesn’t provide abstraction method in it but it can be used by decorators to create the class and method.

@abstractmethod decorator to define an abstract method or if we don't provide the definition to the method, it automatically becomes the abstract method.

Example:-

from abc import ABC, abstractmethod

class Car(ABC):

def mileage(self):

pass

class Tesla(Car):

def mileage(self):

print("The mileage is 30kmph")

class Suzuki(Car):

def mileage(self):

print("The mileage is 25kmph ")

class Duster(Car):

def mileage(self):

print("The mileage is 24kmph ")

class Renault(Car):

def mileage(self):

print("The mileage is 27kmph ")

# Lets create object here to retrieve the ouput

t= Tesla ()

t.mileage()

r = Renault()

r.mileage()

s = Suzuki()

s.mileage()

d = Duster()

d.mileage()

**6. What is the concept of generalization? What function does it play in the machine learning process?**

**-** Generalization refers to a concept where we check how good our model is behaiving on the test data or new data. As we know, the model is been built on training data ie existing data and it gives better output on the training data but checking its ability on the new data set is nothing but generalizaiton. The main function of this process is it identifies the model behaviour and main intuition behind over fitting.

**7.What is classification, exactly? What are the main distinctions between classification and regression?**

- Classification is a part of machine learning algorithm where the output is been classified between two classes. For example :- the number of people differentiating between genders male and female or classifying output with 0 or 1. The main distinction between classification and regression is in regression our prediction is continuous value such as price, income, age, etc and in classification classify the distinct values such as Real or False, Male or Female.

**8. What is regression, and how does it work? Give an example of a real-world problem that was solved using regression.**

- Regression is a machine learning algorithm technique which is used when the target variables or feature values are in continuous format. In this technique , the algorithm find outs the relationship between the independent and dependent variables and on the basis that the best fit line is calculated including less error the model is been built on which the prediction is been done. House price prediction, stock price prediction are few real world examples of regression.

**9. Describe the clustering mechanism in detail.**

- Clustering is a type of unsupervised machine learning technique in which the output is not in a labelled format. In clustering, basically the clusters are been created on the basis of data points. We create a group of clusters which are similar to the data points in the same groups are more similar to other data points in the same group and dissimilar to the data points in other groups. One of the technique used is K-means clustering in which on the basis of K value the distance is been calculated and clusters are formed.