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

* **Human learning is a process of acquiring knowledge.**
* **ex when we see a dog and attach the term 'dog', we learn that the word dog refers to a particular animal.**

2. What different forms of human learning are there? Are there any machine learning equivalents?

* **classical conditioning,**
* **operant conditioning,**
* **and observational learning.**

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

* **learn and adapt without following explicit instructions, by using algorithms and statistical models to analyse and draw inferences from patterns in data.**
* **Study and transform data science prototypes.**
* **Design machine learning systems.**
* **Research and implement appropriate ML algorithms and tools.**
* **Develop machine learning applications according to requirements.**
* **Select appropriate datasets and data representation methods.**
* **Run machine learning tests and experiments**

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

**Penalty is what is given if the model fails in the prediction**

**Reward is what is given after the model performs well and predict correct**

5. Explain the term "learning as a search"?

6. What are the various goals of machine learning? What is the relationship between these and human learning?

* **Understand the patterns**
* **Increase maximum accuracy**
* **Don’t under go in overfitting ,underfitting**
* **to understand the nature of (human and other forms of) learn- ing, and to build learning capability in computers.**
* **Machine wants more and more data to understand the pattern while human can understand quckley**
* **Accuracy of the human is always correct**

7. Illustrate the various elements of machine learning using a real-life illustration.

* **Voice recognition**
* **Spam filter**
* **Image recognition**
* **Medical diagnosis**

8. Provide an example of the abstraction method.

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

* **your model's ability to adapt properly to new, previously unseen data, drawn from the same distribution as the one used to create the model.**

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

|  |  |
| --- | --- |
| **Regression Algorithm** | **Classification Algorithm** |
| * **In Regression, the output variable must be of continuous nature or real value.** | * **In Classification, the output variable must be a discrete value.** |
| * **The task of the regression algorithm is to map the input value (x) with the continuous output variable(y).** | * **The task of the classification algorithm is to map the input value(x) with the discrete output variable(y).** |
| * **Regression Algorithms are used with continuous data.** | * **Classification Algorithms are used with discrete data.** |
| * **In Regression, we try to find the best fit line, which can predict the output more accurately.** | * **In Classification, we try to find the decision boundary, which can divide the dataset into different classes.** |
| * **Regression algorithms can be used to solve the regression problems such as Weather Prediction, House price prediction, etc.** | * **Classification Algorithms can be used to solve classification problems such as Identification of spam emails, Speech Recognition, Identification of cancer cells, etc.** |
| * **The regression Algorithm can be further divided into Linear and Non-linear Regression.** | * **The Classification algorithms can be divided into Binary Classifier and Multi-class Classifier.** |

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

In Regression, the output variable must be of continuous nature or real value

12. Describe the clustering mechanism in detail.

* **Clustering is the task of dividing the population or data points into a number of groups such that 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**

13. Make brief observations on two of the following topics:

i. Machine learning algorithms are used

ii. Studying under supervision

iii. Studying without supervision

iv. Reinforcement learning is a form of learning based on positive reinforcement.