Experiment No. : Date :

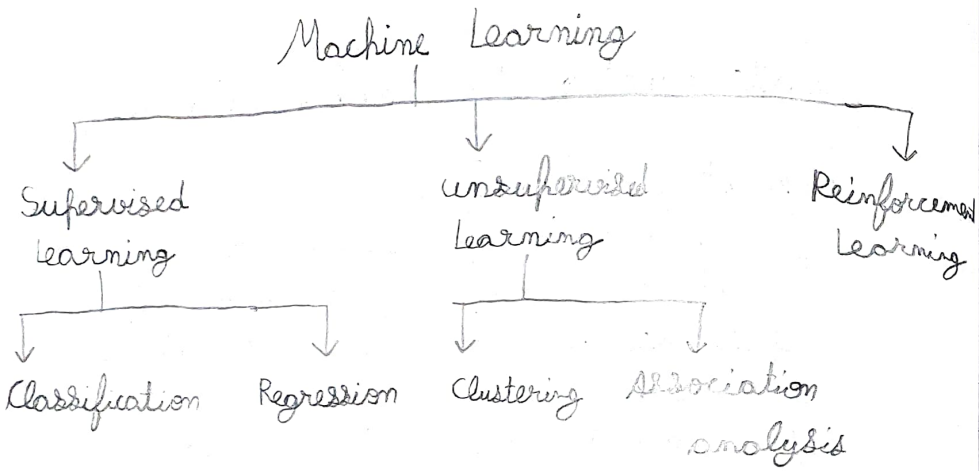
Introduction to Machine learning

definition Machine learning is study of computer architectural algorithms that can improve automatically through enperience and by the use of data

It enables computers to learn from patterns and make decision from data without being explicity programmed

→ A programer builds a math module that map input to output and fed model with pair of (Input + enpected output) to train the model

→ System improves its performance by learning from enperience and adjusting based on data it encounters



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Types of Machine learning

(i) Supervised learning
(ii) Unsupervised learning
(iii) Reinforcement learning

(i) Supervised learning This type of learning is used when you know how to classify a given data or in other words classes or label are available

(ii) Unsupervised learning This type of learning is used when there is no idea about class or label of a particular data the model has to find pattern in data.

(iii) Reinforcement learning This type of learning is used when there is no idea about the class or label of particular data

* Some of python libraries used in ML
(1) Pandas (2) Numpy (3) Matplotlib
(4) Scikit learn (5) Tensorflow

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Python Libraries

(i) Pandas Used for data manipulation and analysis, it offers data structure like dataframes to handle structured data

(ii) Numpy Essential for numerical computing it provides support for large multi-dimensional arrays and matrices.

(iii) Matplotlib A 2D plotting library, it allows visualization of data and model result wide range of interactive plots

(iv) Scikit-learn A versatile tool for machine learning it includes tools for prefrocessing classification, regresion and clustering

(v) Tensorflow A powerful open source framework for deep learning, it facilates building and trsing of neural network

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Aim : write a program to create a data set with 14 entries using python in .csv format

Source code

```
import pandas as pd
import numpy as np

import csv

fields = ['time', 'weather', 'temprature',
'company', 'humidity', 'wind', 'enjoysports']

rows = [
['morning', 'sunny', 'warm', 'yes', 'mild', 'strong', 'yes'],
['evening', 'rainy', 'cold', 'no', 'mild', 'normal', 'no'],
['morning', 'sunny', 'moderate', 'yes', 'normal', 'normal', 'yes'],
['evening', 'sunny', 'cold', 'yes', 'high', 'strong', 'yes']
]

filename = "data.csv"

with open('data.csv', 'w', newline='') as file:
```

	time	weather	temprature	cofong	humidity	wind	Enjoy
0	morning	Sunny	warm	yes	mild	Strong	
1	Evening	rainy	cold	no	mild	normal	yes
2	morning	Sunny	moderate	yes	normal	normal	no
3	Evening	Sunny	Cold	yes	High	Strog	yes
							yes

```
[ ['morning' 'Sunny' 'warm' 'yes' 'mild' 'strog']
  ['Evening' 'rainy' 'cold' 'no' 'mild' 'normal']
  ['morning' 'Sunny' 'moderate' 'yes' 'normal' 'normal']
  ['Evening' 'Sunny' 'Cold' 'yes' 'High' 'Strog'] ]
```

```
['yes' 'no' 'yes' 'yes']
```

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```
Cswriter = csv.writer(file)
Cswriter.writerow(fields)
Cswriter.writerow(rows)

data = pd.read_csv('data.csv')
print(data)

Concept = np.array(data.iloc[:, 0:-1])
print(concept)

target = np.array(data.iloc[:, -1])
print(target)
```

Result Data set was create sucessfully

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// Algorithm

(1) Initialize h to most specific hypothesis
h = {'ϕ', 'ϕ', ... 'ϕ'}

(2) For +ve example
for each attribute in example
if attribute value = hypothesis value
do nothing
else
replace it hypothesis value with
most generalized constraint (?)

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Aim Implement and demonstrate the Find-S algorithm for finding most specific hypotesis based on a given set of training data samples Read the training data from .CSV file

Source code

```
import pandas as pd
import numpy as np

import CSV

data = pd.read('Find s.CSV')

concept = np.array(data.iloc[:,0:-1])
print("concepts value are\n", concepts)

target = np.array(data.iloc[:, -1])
print("target values are\n", targ)

def train(con, tar):
    for i, val in enumerate(tar):
if val.lower() == 'yes':
```

concepts value are

```
[['Sunny' 'warm' 'normal' 'Strong' 'warm' 'same']
 ['Sunny' 'warm' 'high' 'Strong' 'warm' 'same']
 ['rainy' 'cold' 'high' 'strong' 'warm' 'change']
 ['Sunny' 'warm' 'high' 'Strong' 'cool' 'change']]
```

target values are

```
['yes' 'yes' 'no' 'yes']
```

The final hypothesis :

```
['Sunny' 'warm' '?' 'Strong' '?' '?']
```


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```
        specific_h = con[i].copy()
        break
for j, val in enumerate(con):
    if tar[i].lower() == 'yes':
        for x in range(len(specific_h)):
            if val[x] != specific_h[x]:
                specific_h[x] = '?'
            else:
                pass
    return specific_h

print("The final Hypothesis is:", train(concepts, target))
```

Result Fine S algorithm was implemented for given data set