Unit 2

Machine Learning
We have to train the machine learning algorithm for classification.

So what is most important element you need to collect that is data

We need to process the data to check whether the data is valid or not ?
If not then we need to do appropriate changes in data. After that we have to perform the design

What is design and development
Planning is about design
Once you have decided that problem related to classification which particular algorithm applying

Implemetation is development
Testing whether according to planning or requirement?

PERCEPTRON

1. Activation function
2. Y=Wx+c

Input =1 , weight=0
Input=-2,weight=-2 op is 1 given

Ans is 1

Y=1*0+(-2*-2)
4>0 then return 1

We don't need to update the weight value
2. I=0 w=0
   I=-1 w=-2 op is 0 given

Y=2>0 return 1
Here we need to update the weight
Find error
T-y
0-2=-2

COnt1.

W1new=w1+neta.e*x1
=0+1*1*0
=0
Neta is learning rate parameter which is 1

Whether we are working with perceptron then Activation function is required

X1--------w1
X2--------w2------------y
X3-------w3

Suppose we are getting the op as -5 that is not in range .
SO AF will map the value into desirable op

Exercise1

```
Import numpy as np
X=input('Enter shape(round/ecclipse)')
If x=='round':
Shape=1
Else:
Shape=-1
X=input('Enter tesxture(smooth/rash)')
If x=='smooth':
Texture=1
Else:
Texture=-1

X=int(input('enter the weight in pound'))
If x>=1:
Wt=1
Else:
Wt=-1
In_vect=np.array([shape,texture,wt])
Print(in_vect.T)
W=np.array([0,1,0])
```

Ex1

```
B=0
Y=(w*x).sum()+b
Def perceptron(x):
If x>=0
Return 1
Else:
Return -1
Out=perceptron(y)
Print(out)
If out==1:
Print(‘Apple)
Else:
Print(‘orange’)
```

Types of data

Data you can say that it is an important entity and tool in Machine learning

We can say that machine learning is notihng without data

1. Structured
2. Unstructured
3. Big data

1. What is structured data wrt Machine Learning

Data which is in tabular format is called as strcutured
Which consists of rows and columns
Column can be called feature and dimension
Row can called as case
Its for beginners

2. Unstructured

Image and videos and messages or email
It is complex as compare to structured.
It cant be stored in Tabular form

Types of data

Big data is complex to handle.
For advance learners

Convert the data

How to convert the category into numeric

If data is available in form of country and all which is char in nature and then do the classification work or for some other work you want to change the data Into numeric

For ex:
There is product in form of furniture

```
Import pandas as pd
Iris=pd.read_csv('iris.csv')
Iris.head()
```

last column you can see that is species category .

```
Iris['code']=pd.factorize(iris.species)[0]
Iris.head()
Iris.species.value_counts()
Iris.code.value_counts()
```

Convert the data

Another method

```
From sklearn.preprocessing import LabelEncoder
Le=LabelEncoder()
Iris[‘code_le’]=le.fit_transform(iris.species)
Iris.tail()
```

Sklearn is the processsing library