**Machine Learning**

**Ex: 07 Single Layer Peceptron**

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**Code:**

def modify\_w(w,x,error,l):

return(w+l\*error\*x)

#Gate Inputs and Output

x1=[0,0,1,1]

x2=[0,1,0,1]

y=[0,1,1,1]

#And [0,0,0,1]

#OR [0,1,1,1]

#Nand [1,1,1,0]

#Nor [1,0,0,0]

print("x1: "+str(x1))

print("x2: "+str(x2))

print("y: "+str(y))

#Learning rate

l=0.1

#initial weights

w1=2

w2=0

wb=0

print("\nBefore:")

print("w1= "+str(w1))

print("w2= "+str(w2))

print("wb= "+str(wb))

print("\n")

#b values

b=[1,1,1,1]

th=0 #throushhold

# for AND gate th=0

# for OR gate th=-1

# for NAND gate th=-1

# for NOR gate th=0

epoc=100

for i in range(epoc):

yout=[]

for i in range(4):

fx= (x1[i]\*w1)+(x2[i]\*w2)+(b[i]\*wb)

if fx>th:

yout.append(1)

error=y[i]-1

else:

yout.append(0)

error=y[i]

if (error!=0):

w1=modify\_w(w1,x1[i],error,l)

w2=modify\_w(w1,x2[i],error,l)

wb=modify\_w(wb,b[i],error,l)

#testing

ytest=[]

for i in range(4):

fx= (x1[i]\*w1)+(x2[i]\*w2)+(b[i]\*wb)

if fx>th:

ytest.append(1)

else:

ytest.append(0)

if (ytest==yout):

print(ytest==yout)

break

else:

print(ytest==yout)

print("\nAfter:")

print("w1= "+str(w1))

print("w2= "+str(w2))

print("wb= "+str(wb))

print("yout: "+str(yout))

**Output:**

