**SOFT COMPUTING**

**ENDTERM PRACTICAL**

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**AIM:Write a program to implement AND/OR/AND-NOT Logic Function using MP-Neuron.**

**CODE:**

#AND

import numpy as np

x=np.array([[1,1],[1,0],[0,1],[0,0]])

t=np.array([[1],[0],[0],[0]])

w=np.array([[0],[0]])

theta=1

yin=np.zeros(shape=(4,1))

y=np.zeros(shape=(4,1))

yin=np.dot(x,w)

i=0

found=0

while(found==0):

        i=0

        yin=np.dot(x,w)

      #print(yin)

        while(i<4):

            if yin[i]>=theta:

                y[i]=1

                i=i+1

            else:

              y[i]=0

              i=i+1

        if (y==t).all():

          print("MODEL IS TRAINED ")

          print("\nOutput : \n",y)

          print("\nweights : ",w,"\n")

          print("theta : ",theta)

          found=1

        else:

            print("MODEL IS NOT TRAINED")

            w=np.zeros(shape=(0,0))

            theta=int(input("Enter New Theta : "))

            for k in range(int(2)):

              w1=int(input("Enter Weight : "))

              w=np.append(w,w1)

**OUTPUT:**

MODEL IS NOT TRAINED

Enter New Theta : 1

Enter Weight : 1

Enter Weight : -1

MODEL IS TRAINED

Output :

[[0.]

[1.]

[0.]

[0.]]

weights : [ 1. -1.]

theta : 1

#OR

import numpy as np

x=np.array([[1,1],[1,0],[0,1],[0,0]])

t=np.array([[1],[1],[1],[0]])

w=np.array([[0],[0]])

theta=1

yin=np.zeros(shape=(4,1))

y=np.zeros(shape=(4,1))

yin=np.dot(x,w)

i=0

found=0

while(found==0):

    i=0

    yin=np.dot(x,w)

    while(i<4):

        if yin[i]>=theta:

            y[i]=1

            i=i+1

        else:

            y[i]=0

            i=i+1

    #print("y",y)

    #print("t",t)

    if(y==t).all():

        print("MODEL IS TRAINED ")

        print("\nOutput : \n",y)

        print("\nweights : ",w,"\n")

        print("theta : ",theta)

        found=1

    else:

        print("MODEL IS NOT TRAINED")

        w=np.zeros(shape=(0,0))

        theta=int(input("Enter New Theta : "))

        for k in range(int(2)):

            w1=int(input("Enter Weight : "))

            w=np.append(w,w1)

**OUTPUT:**

MODEL IS NOT TRAINED

Enter New Theta : 1

Enter Weight : 1

Enter Weight : 1

MODEL IS TRAINED

Output :

[[1.]

[1.]

[1.]

[0.]]

weights : [1. 1.]

theta : 1

#AND-NOT

import numpy as np

x=np.array([[1,1],[1,0],[0,1],[0,0]])

t=np.array([[0],[1],[0],[0]])

w=np.array([[0],[0]])

theta=1

yin=np.zeros(shape=(4,1))

y=np.zeros(shape=(4,1))

yin=np.dot(x,w)

i=0

found=0

while(found==0):

    i=0

    yin=np.dot(x,w)

      #print(yin)

    while(i<4):

        if yin[i]>=theta:

            y[i]=1

            i=i+1

        else:

            y[i]=0

            i=i+1

    #print("y",y)

    #print("t",t)

    if (y==t).all():

        print("MODEL IS TRAINED ")

        print("\nOutput : \n",y)

        print("\nweights : ",w,"\n")

        print("theta : ",theta)

        found=1

    else:

        print("MODEL IS NOT TRAINED")

        w=np.zeros(shape=(0,0))

        theta=int(input("Enter New Theta : "))

        for k in range(int(2)):

            w1=int(input("Enter Weight : "))

            w=np.append(w,w1)

**OUTPUT:**

MODEL IS NOT TRAINED

Enter New Theta : 1

Enter Weight : 1

Enter Weight : -1

MODEL IS TRAINED

Output :

[[0.]

[1.]

[0.]

[0.]]

weights : [ 1. -1.]

theta : 1