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# Experiment 3

**Aim**: Write a program to implement Perceptron Learning Algorithm for 3 input AND gate.

## Program:

import numpy as np   
import random  
op=[]  
for i in range(0,6):  
 op.append(0)  
and\_gatei = [  
# [(inputs)]  
    [1, 1, 1],  
    [1, 1, 0],  
    [1, 0, 1],  
    [1, 0, 0],  
    [0, 1, 1],  
    [0, 1, 0],  
]

and\_gateo=[1,0,0,0,0,0]

weights=[];  
for i in range (0,3):  
 weights.append(random.randint(-100,100))

n=100 #training the preceptron 100 times      
threshold=100  
learning\_rate=0.1  
for x in range(1,n):  
 for i in range (0,3):  
  for j in range(0,6):  
   op[j]=np.dot(and\_gatei[i], weights)   
   if(op[j]<=threshold):  
    op[j]=0  
   else:  
    op[j]=1  
      
   if(op[j]!=and\_gateo[j]):  
       for l in range (0,3):  
           weights[l]=weights[l]+(and\_gateo[j]-op[j])\*learning\_rate

for i in range (0,3):          
 print(weights[i])  
   
loop=1  
while(loop):   
 m=eval(input('Enter three inputs for and gate:'))  
 print('Output:')  
 eop=np.dot(m, weights)  
 if(eop<=threshold):  
  eop=0  
 else:  
  eop=1  
 print(eop)     
 loop=eval(input('Enter 1 to renter input 0 to exit:'))

## Results:

Since [0,0,0] and [0,0,1] are not included in our training set .Therefore taking [0,0,0] and [0,0,1] we get the correct outputs.

