|  |
| --- |
| w1=w2=None |
|  | x1list=x2list=None |
|  | expectedOp=None |
|  | t=None |
|  | a=None |
|  |  |
|  | def main(): |
|  | w1, w2 = -0.2, 0.4 |
|  | x1list, x2list = [0,0,1,1], [0,1,0,1] |
|  | expectedOp = [0,1,1,1] |
|  | t = 0 |
|  | a = 0.2 |
|  | epochs = 0 |
|  | actualOp = [] |
|  | print("OR Gate:") |
|  | print("Epoch X1 X2 Expected\_Y Actual\_Y Error w1 w2") |
|  | while expectedOp!=actualOp: |
|  | epochs+=1 |
|  | actualOp = [] |
|  | for i in range(4): |
|  | actualOp.append(1 if w1\*x1list[i]+w2\*x2list[i]>t else 0) |
|  | err = expectedOp[i] - actualOp[i] |
|  | if err: |
|  | w1+= a\*x1list[i]\*err |
|  | w2+= a\*x2list[i]\*err |
|  | print(epochs,' ',x1list[i],'',x2list[i],'',expectedOp[i],'\t ',actualOp[i],' ',err,' ',w1,w2) |
|  |  |
|  | print("------------------------------------------------------------------------") |
|  |  |
|  | w1, w2 = 1.2, 0.6 |
|  | x1list, x2list = [0,0,1,1], [0,1,0,1] |
|  | expectedOp = [0,0,0,1] |
|  | t = 1 |
|  | a = 0.5 |
|  | epochs = 0 |
|  | actualOp = [] |
|  | print("AND Gate:") |
|  | print("Epoch X1 X2 Expected\_Y Actual\_Y Error w1 w2") |
|  | while expectedOp!=actualOp: |
|  | epochs+=1 |
|  | actualOp = [] |
|  | for i in range(4): |
|  | actualOp.append(1 if w1\*x1list[i]+w2\*x2list[i]>t else 0) |
|  | err = expectedOp[i] - actualOp[i] |
|  | if err: |
|  | w1+= a\*x1list[i]\*err |
|  | w2+= a\*x2list[i]\*err |
|  | print(epochs,' ',x1list[i],'',x2list[i],'',expectedOp[i],'\t ',actualOp[i],' ',err,' ',w1,w2) |
|  |  |
|  | print("------------------------------------------------------------------------") |
|  |  |
|  | w1 = -0.04 |
|  | x1list = [0,1] |
|  | expectedOp = [1,0] |
|  | t = -0.1 |
|  | a = 0.5 |
|  | epochs = 0 |
|  | actualOp = [] |
|  | print("NOT Gate:") |
|  | print("Epoch X1 Expected\_Y Actual\_Y Error w1") |
|  | while expectedOp!=actualOp: |
|  | epochs+=1 |
|  | actualOp = [] |
|  | for i in range(2): |
|  | actualOp.append(1 if w1\*x1list[i]>t else 0) |
|  | err = expectedOp[i] - actualOp[i] |
|  | if err: |
|  | w1+=a\*x1list[i]\*err |
|  | print(epochs,' ',x1list[i],'',expectedOp[i],'\t ',actualOp[i],' ',err,' ',w1) |
|  |  |
|  | if \_\_name\_\_=="\_\_main\_\_": |
|  | main() |