

```
In [1]: ▶ import numpy as np
import pandas as pd
```

```
In [16]: ▶ df = pd.DataFrame([[0,0,0],
                             [0,1,0],
                             [1,0,1],
                             [1,1,0]], columns = ['A', 'B', 'Output'])
```

```
In [17]: ▶ df
```

```
Out[17]:
```

	A	B	Output
0	0	0	0
1	0	1	0
2	1	0	1
3	1	1	0

```
In [26]: ▶ w = [1,-1]
def AND(x):
    y = np.dot(x,w)
    return bin_step(y, 1)
```

```
In [29]: ▶ def bin_step(y, th):
    return 1 if y>=1 else 0
```

```
In [30]: ▶ print(f' A = 0 and B = 0 then output {AND([0,0])}')
print(f' A = 0 and B = 1 then output {AND([0,1])}')
print(f' A = 1 and B = 0 then output {AND([1,0])}')
print(f' A = 1 and B = 1 then output {AND([1,1])}')
```

```
A = 0 and B = 0 then output 0
A = 0 and B = 1 then output 0
A = 1 and B = 0 then output 1
A = 1 and B = 1 then output 0
```

```
In [31]: ▶ # Play (2 Hrs)   Study(4 Hrs)   Output
#      0                0                0
#      0                1                0
#      1                0                0
#      1                1                1

import numpy as np
import pandas as pd
df = pd.DataFrame([[0,0,0],
                  [0,1,0],
                  [1,0,0],
                  [1,1,1]], columns = ['Play', 'Study', 'Output'])
```

```
In [32]: ▶ df
```

```
Out[32]:
```

	Play	Study	Output
0	0	0	0
1	0	1	0
2	1	0	0
3	1	1	1

```
In [33]: ▶ w = [1,1]
def AND(x):
    y = np.dot(x,w)
    return bin_step(y, 2)
```

```
In [36]: ▶ def bin_step(y, th):  
          return 1 if y>=th else 0
```

```
In [37]: ▶ print(f' Play = 0 and Study = 0 then output {AND([0,0])}')  
          print(f' Play = 0 and study = 1 then output {AND([0,1])}')  
          print(f' Play = 1 and Study = 0 then output {AND([1,0])}')  
          print(f' Play = 1 and Study = 1 then output {AND([1,1])}')
```

```
Play = 0 and Study = 0 then output 0  
Play = 0 and study = 1 then output 0  
Play = 1 and Study = 0 then output 0  
Play = 1 and Study = 1 then output 1
```

```
In [ ]: ▶
```