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CS 440

HW 10

* 1. P (BuyJersey = yes) = 7/11 = 0.63, P (BuyJersey = No) = 1 – P(BuyJersey) = 1 – 0.63 = 0.37
  2. P(Weather = clear) = 4/11, P(Weather = cloudy) = 3/11, P (Weather = rainy) = 4/11

P(Weather = clear | BuyJersey = yes) = 3/7

P(Weather = clear | BuyJersey = no) = ¼

P(Weather = cloudy | BuyJersey = yes) = 2/7

P (Weather = cloudy | BuyJersey = No) = ¼

P (Weather = rainy | BuyJersey = Yes) = 2/7

P (Weather = rainy | Buyjersey = No) = 2/4

* 1. P(Uniform = Crimson | BuyJersey = Yes) = 6/7

P(Uniform = Crimson | BuyJersey = No) = 0/4

P (Unifrom = Gray | BuyJersey = Yes ) = 1/7

P (Unifrom = Gray | BuyJersey = No ) = 4/4

* 1. P( Win = yes | BuyJersey = Yes) = 4/7

P (Win = Yes | BuyJersey = No) = ¾

P(Win = No | BuyJersey = Yes) = 3/7

P(Win = No | BuyJersey = No) = 3/4

* 1. P (BuyJersey = yes | Weather = cloudy, Uniform = gray, Win = yes) = 0 = 1/2

P (BuyJersey = no | Weather = cloudy, Uniform = gray, Win = yes) = 0 = 1/2

* 1. Since both P (BuyJersey = yes | Weather = cloudy, Uniform = gray, Win = yes) and P (BuyJersey = no | Weather = cloudy, Uniform = gray, Win = yes) is 50%, both BuyJersey = yes and BuyJersey = no class are possible to be chosen.

|  |  |  |  |
| --- | --- | --- | --- |
| Weather | Uniform | Win | BuyJersey |
| 0 | 0 | 1 | 1 |
| 0 | 0 | 0 | 1 |
| 0 | 1 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 |
| 1 | 1 | 0 | 0 |
| 2 | 0 | 1 | 1 |
| 2 | 0 | 0 | 1 |
| 2 | 1 | 1 | 0 |
| 2 | 1 | 0 | 0 |

* 1. New instance: <Weather = 1, Uniform = 1, Win = 1>

Perceptron: . It would identify the new instance as YES.

* 1. J

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Instance | Correct |  |  |  |  |
| 0 | NAN | 1 | 1 | 1 | 1 |
| 1 | True | 1 | 1 | 1 | 1 |
| 2 | True | 1 | 1 | 1 | 1 |
| 3 | True | 1 | 1 | 1 | 1 |
| 4 | False | 1-0.5=0.5 | 1+0 = 1 | 1-0.5=0.5 | 1 |
| 5 | True | 0.5 | 1 | 0.5 | 1 |
| 6 | True | 0.5 | 1 | 0.5 | 1 |
| 7 | False | 0.5-0.5=0 | 1-0.5=0.5 | 0.5-0.5=0 | 1 |
| 8 | True | 0 | 0.5 | 0 | 1 |
| 9 | True | 0 | 0.5 | 0 | 1 |
| 10 | False | -0.5 | -0.5 | -0.5 | 0.5 |
| 11 | True | -0.5 | -0.5 | -0.5 | 0.5 |

* 1. New perceptron: -0.5\*1-0.5\*1-0.5\*1-0.5\*1-0.5\*1 < 0

New perceptron would identify this new instanced as No