Brianna Shade

CS545: Machine Learning

2/16/14

Project 3: Naïve Bayes Classification

* 1. P(Att1=1|+1) = 4/6 P(Att1=0|+1) = 2/6 P(Att1=1|-1) = 3/6 P(Att1=0|-1) = 3/6

P(Att2=1|+1) = 4/6 P(Att2=0|+1) = 2/6 P(Att2=1|-1) = 2/6 P(Att2=0|-1) = 4/6

P(Att3=1|+1) = 3/6 P(Att3=0|+1) = 3/6 P(Att3=1|-1) = 3/6 P(Att3=0|-1) = 3/6

P(Att1=1|+1) = 4/6 P(Att1=0|+1) = 2/6 P(Att1=1|-1) = 1/6 P(Att1=0|-1) = 5/6

* 1. +1: (4/8)(4/6)(4/6)(3/6)(2/6) = .5 \* .67 \* .67 \* .5 \* .33 = 0.037

-1: (4/8)(3/6)(2/6)(3/6)(5/6) = .5 \* .5 \* .33 \* .5 \* .83 = 0.0347

Classification: +1

|  |  |
| --- | --- |
| Rep | .7 |
| Dem | .3 |

|  |  |  |
| --- | --- | --- |
|  | “Right” | “Left” |
| Rep | .1 | .9 |
| Dem | .9 | .1 |

|  |  |  |
| --- | --- | --- |
|  | True | False |
| “Right” | .8 | .2 |
| “Left” | .5 | .5 |

* 1. P(Dem|”Left”) = (P(“Left”|Dem) \* P(Dem))/P(“Left”)

P(“Left”|Dem) = .1

P(Dem) = .3

P(“Left”) = (P(“Left”|Rep) \* P(Rep)) + (P(“Left”|Dem) \* P(Dem)) = (.9 \* .7)+(.1 \* .3) = .63 + .03 = .69

(.1 \* .3)/.69 = .03/.69 = .0435 = 4.35%

* 1. P(Dem|Five-star, “Right”) = (P(Five-star|”Right”) \* P(“Right”))/P(Five-star)

P(Five-star|”Right”) = .8

P(“Right”) = (P(“Right”|Rep) \* P(Rep)) + (P(“Right”|Dem) \* P(Dem)) = (.1 \* .7)+(.9 \* .3) = .07 + .27 = .34

P(Five-star) = (P(Five-star|”Right”) \* P(“Right”)) + (P(Five-star|”Left”) \* P(“Left”)) = (.8 \* .34) + (.5 \* .69) = .272 + .345 = .617 = 61.7%

OVERVIEW

RESULTS

OBSERVATIONS

CONCLUSION