Assignment 4

Decision tree

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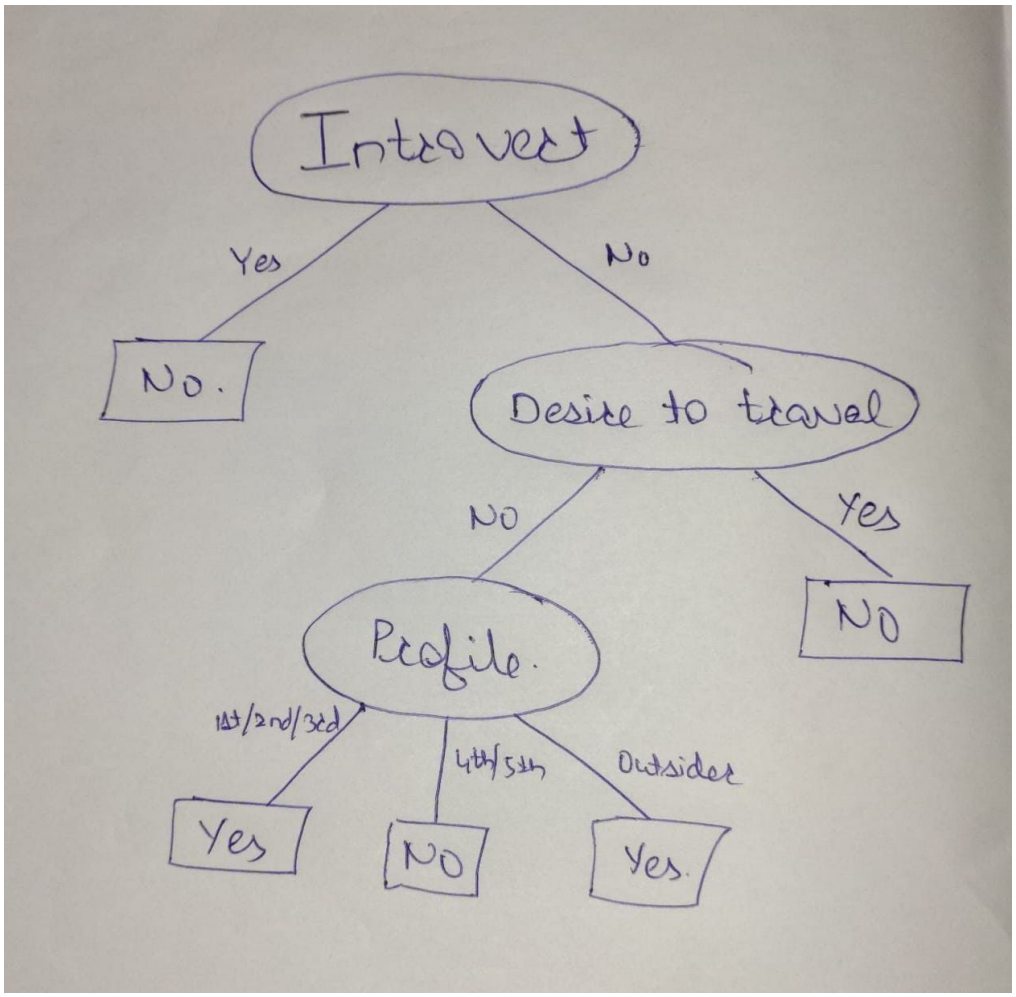
Final decision tree



B(q) = −(q log 2 q + (1 − q) log 2 (1 − q))

Stepwise procedure

Step 1

Net entropy=0.6500224216483541

Depth = 0

Condition = None

field	Entropy	Information gain
0	**((1+3)/(2+10))B(1/(1+3)) + ((0+4)/(2+10))B(0/(0+4)) + ((1+3)/(2+10))B(1/(1+3)) =** 0.5408520829727552	0.10917033867559889
1	**((0+6)/(2+10))B(0/(0+6)) + ((2+4)/(2+10))B(2/(2+4)) =** 0.4591479170272448	0.19087450462110933
2	**((0+6)/)(2+10))B(0/(0+6)) + ((2+4)/(2+10))B(2/(2+4)) =** 0.4591479170272448	0.19087450462110933

Selected field = 1

Step 2

Net entropy = 0

Condition = Yes

Depth = 1

Leaf node label = No

Step 3

Net entropy = 0.9182958340544896

Condition = No

Depth = 1

Field	Entropy	Information gain
0	**((1+1)/(2+4))B(1/(1+1)) + ((0+2)/(2+4))B(0/(0+2)) + ((1+1)/(2+4))B(1/(1+1)) =** 0.6666666666666666	0.2516291673878229
2	**((0+3)/)(2+4))B(0/(0+3)) + ((2+1)/(2+4))B(2/(2+1)) =** 0.4591479170272448	0.4591479170272448

Selected feature = 2

Step 4

Net entropy = 0

Condition = No and Yes

Depth = 2

Leaf node label = No

Now we are just left with one feature

Step 5

Condition = No and No and 1st/2nd/3rd year

Depth = 3

Leaf node label = Yes

Step 6

Condition = No and No and 4th/5th year

Depth = 3

Leaf node label = No

Step 7

Depth = 3

Condition = No and No and outsider

Leaf node label = Yes