

Q.1) When the depth is 1, the decision tree finds the best split on column 4 (numbering the column starts from 1). When the depth is 2, and if the first split is at column 4, we select column 6 for splitting the data again. Else, we find column 5 if column 4 is false.

If column 4 is false and column 5 true, the tree predicts B  
If column 4 is false and column 5 false, the tree predicts B  
If column 4 is true and column 6 true, the tree predicts B  
If column 4 is true and column 6 false, the tree predicts A

Output from Console:

Depth - 1, Best split - 4

Depth - 2, Best split - 5 & 6

Column 4 true and column 6 true: B with count = 9

Column 4 true and column 6 false: A with count = 40

Column 4 false and column 5 false: B with count = 26

Column 4 false and column 5 true: B with count = 90

Q.2)

a) Error rate of the first stump: 0.18

b) Hypothesis weight of the first stump: 1.5163474893

c) Initial weights for each example:  $1/200$

d) New weights for each example that was incorrectly classified:  
0.005

New weights for each example that was correctly  
classified: 0.01097