

## Problems – Decision trees

### Problem 1

- a) Build a decision tree through the ID3 method, using the following training set:

$x_1$	$x_2$	$x_3$	$y$
A	A	A	0
B	B	B	0
B	B	A	0
B	A	B	1
B	B	B	1
A	B	B	1
B	A	B	1
B	B	B	0

- b) Prune the tree that you obtained, using the following pruning set:

$x_1$	$x_2$	$x_3$	$y$
A	A	A	0
B	B	B	1
B	B	A	0
B	A	B	1
B	B	B	1
A	B	B	1
B	B	B	0

### Problem 2

- a) Build a decision tree using the following training set. Consider the misclassification probability as impurity criterion.

$x_1$	$x_2$	$x_3$	$y$	$x_1$	$x_2$	$x_3$	$y$
0	0	0	0	0	1	1	2
0	0	1	0	0	1	1	2
0	1	0	0	1	0	0	0
0	1	0	0	1	1	1	1
0	1	1	1	1	1	1	1