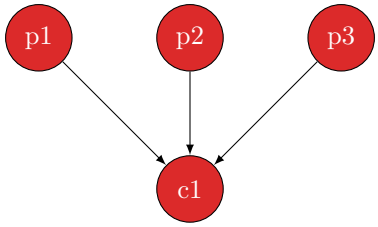
1 Network



Rysunek 1: Test network

All nodes are binary.

1.1 Test 1

All parents at

state	p
true	0.5
false	0.5

Results (10k sample):

```
0 0 0 0 |  611 | 0.0611%
0 0 0 1 |  658 | 0.0658%
0 0 1 0 |  656 | 0.0656%
0 0 1 1 |  616 | 0.0616%
0 1 0 0 |  615 | 0.0615%
0 1 0 1 |  599 | 0.0599%
0 1 1 0 |  676 | 0.0676%
0 1 1 1 |  625 | 0.0625%
1 0 0 0 |  623 | 0.0623%
1 0 0 1 |  650 | 0.0650%
1 0 1 0 |  621 | 0.0621%
1 0 1 1 |  653 | 0.0653%
1 1 0 0 |  583 | 0.0583%
1 1 0 1 |  606 | 0.0606%
1 1 1 0 |  608 | 0.0608%
1 1 1 1 |  600 | 0.0600%
```

1.2 Test 2

Every parent at:

state	p
true	0.1
false	0.9

Results (10k sample):

```
0 0 0 0 | 3667 | 0.3667%
0 0 0 1 | 3577 | 0.3577%
0 0 1 0 |  404 | 0.0404%
0 0 1 1 |  422 | 0.0422%
0 1 0 0 |  406 | 0.0406%
0 1 0 1 |  405 | 0.0405%
0 1 1 0 |   45 | 0.0045%
0 1 1 1 |   35 | 0.0035%
1 0 0 0 |  436 | 0.0436%
1 0 0 1 |  410 | 0.0410%
1 0 1 0 |   37 | 0.0037%
1 0 1 1 |   49 | 0.0049%
1 1 0 0 |   49 | 0.0049%
1 1 0 1 |   47 | 0.0047%
1 1 1 0 |    6 | 0.0006%
1 1 1 1 |    5 | 0.0005%
```

1.3 Test 3

Every parent at:

state	p
true	0.9
false	0.1

Results (10k sample):

```
0 0 0 0 |    8 | 0.0008%
0 0 0 1 |    4 | 0.0004%
0 0 1 0 |   48 | 0.0048%
0 0 1 1 |   42 | 0.0042%
0 1 0 0 |   46 | 0.0046%
0 1 0 1 |   38 | 0.0038%
0 1 1 0 |  365 | 0.0365%
0 1 1 1 |  395 | 0.0395%
1 0 0 0 |   46 | 0.0046%
1 0 0 1 |   32 | 0.0032%
```

```
1 0 1 0 |  376 | 0.0376%
1 0 1 1 |  424 | 0.0424%
1 1 0 0 |  390 | 0.0390%
1 1 0 1 |  390 | 0.0390%
1 1 1 0 | 3722 | 0.3722%
1 1 1 1 | 3674 | 0.3674%
```

- Leak parameter in Test 3 comes with a high error (0.667% vs ideal 0.5%), which is later taken into exponent.
- Leak denominator (p('0 0 0 0') + p('0 0 0 1')) equals to $(p_{1,false})\dot{(}p_{2,false})\dot{(}p_{3,false})$ % of all records

p1 false	p2 false	p3 false	leak denominator (% of all records)
0.9	0.9	0.9	0.729
0.7	0.8	0.9	0.504
0.7	0.7	0.7	0.342
0.5	0.5	0.5	0.125
0.5	0.5	0.1	0.025
0.2	0.2	0.2	0.008
0.1	0.1	0.1	0.001
0.3	0.01	0.3	0.0009
0.7	0.01	0.5	0.0035

- It gets worse as the number of parents increases

number of parents	false prob for each parent	leak denominator (% of all records)
7	0.8	0.209
7	0.7	0.082
7	0.6	0.028
7	0.5	0.008
7	0.4	0.0016
9	0.8	0.1342
9	0.7	0.0403
9	0.6	0.01
9	0.5	0.001
15	0.6	0.0004
17	0.6	0.0001
17	0.6	0.0001
20	0.75	0.003

1.4 Different leak errors for prior prob. as in Test 3 (10K sample)

test	val	error
1	0.4	0.1
2	0.4	0.1
3	0.4	0.1
4	0.4	0.1
5	0.8	0.3
6	0.667	0.167
7	0.5	0.0
8	0.333	0.167
9	0.166	0.334

1.5 Different leak errors for prior prob. as in Test 3 (2K sample)

test	val	error
1	0.0*	0.5
2	0.667	0.167
3	0.0*	0.5
4	0.0*	0.5
5	0.0*	0.5
6	0.0*	0.5
7	0.0*	0.5

* - division by zero or 1/1

1.6 Different leak errors for prior prob. as in Test 3 (1K sample)

test	val	error
1	0.5	0.0
2	0.0*	0.5
3	0.33..	0.166..
4	1.0*	0.5
5	0.666..	0.1666

* - division by zero or 1/1

- Denominator for LEAK in previous networks consisted of 25% of whole record file.