Decision Tree Exercise

Exercise 1. INITIATING – DECISION MAKING (6 POINTS)

PROBLEM

Your pizza business is earning net revenues of €120 per year.Current overhead is €50 per year.
You have some savings to be used for expansion of your business.
You have the choice between either putting up a new shop of your pizza business in a city further away or, more simply, setting up a small shop, a point of sale, in a nearby town.
If you set up a new shop there are the following probabilities for the economy in the far city:

- does well: 37%
- remains the same: 29%
- does bad: 34%

Correspondingly the net revenues will be:

- does well:
  - the shop has a probability of being a hit of 71% and your business net revenues will be €400
  - the shop otherwise will be comparable to your existing and your business net revenues will be €240
- remains the same: additional net revenues of €85
- does bad: additional net revenues of €25

If you set up a small shop nearby there are equal probabilities that the economy will do well, bad or will remain the same.

- If you take the latter decisions net revenues will be:
- does well: increase your business net revenues by 70%
- remains the same:
  - 62% probability of your business net revenues of €166
  - 38% probability of your business net revenues of €146
- does bad: increase your business net revenues by 30%

The additional overhead of running the new shop is €30 per year, while running the small point of sale will increase your business overhead by 30%.
If you decide to do nothing consider the following chances: 70% your business will be as usual and 30% probability that your turnover and net sales will decrease by 40%. On the other hand you'll leave your business savings in a saving account that will earn you €15 by year, decreasing your business overhead.

What will you decide?

SOLUTION

By excel

Prepare a workbook like the example 8.3.1_decision_tree.xlsx

you should obtain a computation like this:

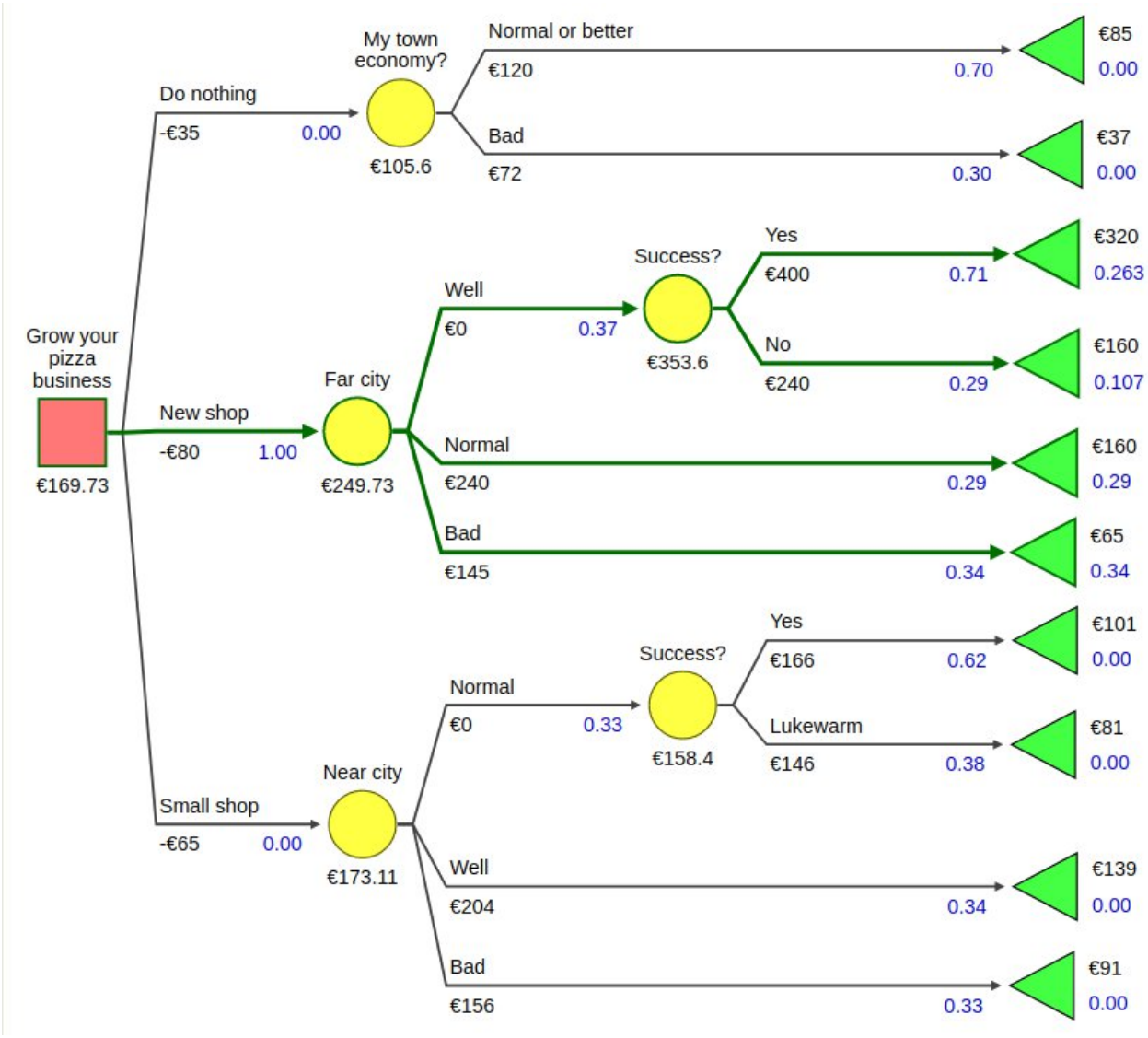
N	Label	Expected	Branch	Payoff	Expected	N	Label	Expected	Branch	Payoff	Probab.	N		Expected					
D	Growth of the pizza business	***€ 170***	**Do nothing**	-€ 35	***€ 71***	C	Current business	***€ 106***	**Business as usual**	€ 120	70%	T		***€ 84***					
									Bad	€ 72	30%	T		***€ 22***					
			Branch	Payoff	Expected	N	Label	Expected	Branch	Payoff	Probab.	N	Label	Expected	Branch	Payoff	Probab.	N	Expected
			New shop	-€ 80	***€ 170***	C	Far city economy	***€ 250***	**Well**	€ 0	37%	T	Immediate success?	***€ 131***	**Yes**	€ 400	71%	T	***€ 284***
															No	€ 240	29%	T	***€ 70***
									Branch	Payoff	Probab.	N		Expected					
									Normal	€ 240	29%	T		***€ 70***					
									Bad	€ 145	34%	T		***€ 49***					
			Branch	Payoff	Expected	N	Label	Expected	Branch	Payoff	Probab.	N	Label	Expected	Branch	Payoff	Probab.	N	Expected
			Small shop	-€ 65	***€ 108***	C	Near city economy	***€ 173***	**Normal**	€ 0	33%	T	Immediate success?	***€ 53***	**Yes**	€ 166	62%	T	***€ 103***
															No	€ 146	38%	T	***€ 55***
									Branch	Payoff	Probab.	N		Expected					
									Well	€ 204	33%	T		***€ 68***					
									Bad	€ 156	33%	T		***€ 52***					

By Silver Decisions

Goto http://silverdecisions.pl/.

Run a new decision tree.

The result should be:


Grow your pizza business
€169.73
Do nothing
-€35
0.00
My town economy?
€105.6
Normal or better
€120
0.70
€85
0.00
Bad
€72
0.30
€37
0.00
New shop
-€80
1.00
Far city
€249.73
Well
€0
0.37
Success?
€353.6
Yes
€400
0.71
€320
0.263
No
€240
0.29
€160
0.107
Normal
€240
0.29
€160
0.29
Bad
€145
0.34
€65
0.34
Small shop
-€65
0.00
Near city
€173.11
Normal
€0
0.33
Success?
€158.4
Yes
€166
0.62
€101
0.00
Lukewarm
€146
0.38
€81
0.00
Well
€204
0.34
€139
0.00
Bad
€156
0.33
€91
0.00