



Improving the Way We Ask **‘What Do You Do?’**

**An Enabler of Self-Serve for Commercial
Lines Property/Casualty Insurance**

Presented by

Marc-André Desrosiers, MBA, FCAS, Actuarial Expert

Marion Grégoire-Duclos, FCAS, Actuarial Consultant

William Léchelle, Ph.D. Student

2017-08-11



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD



DIRO

Problem Re-Statement



How can a non-expert user efficiently select their activity code out of a taxonomy of > 1000 codes, for insurance purposes?



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD



DIRO

The Team



What's do you do?

www.GentleEnglish.com



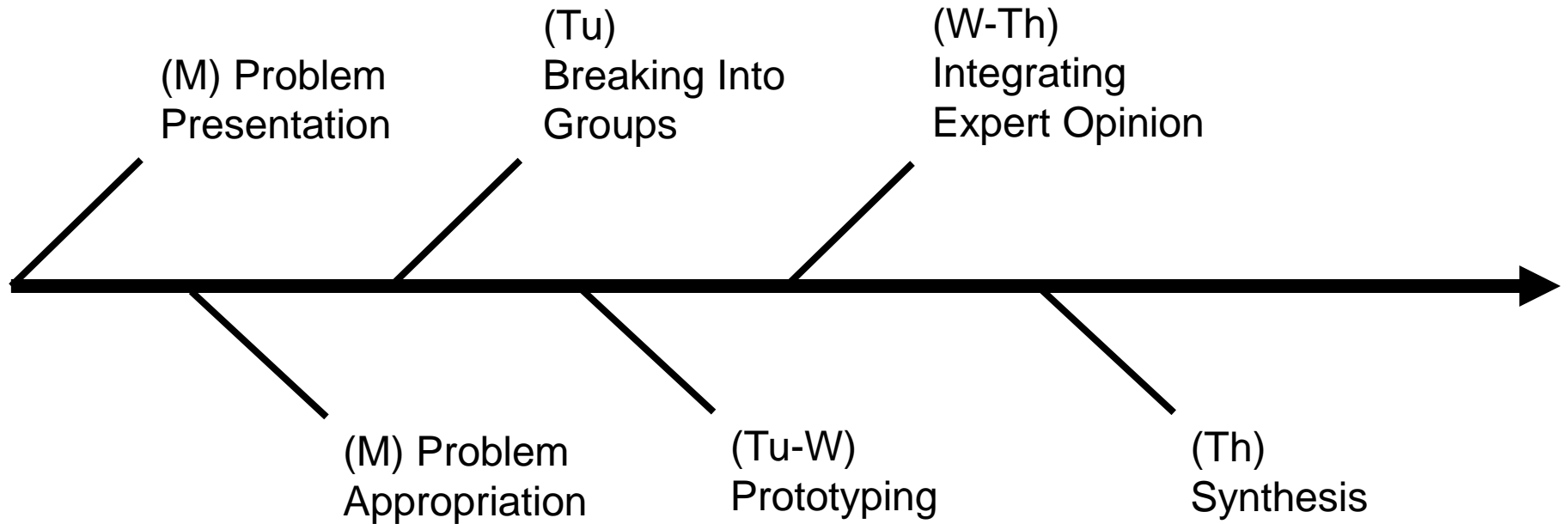
Une place de choix^{MD}
the co-operators[®]
 A Better Place For You[®]

MOVING
COMMERCIAL
 FORWARD



DIRO

The Timeline



An Academic Point-of-View



- No training data
- Business intelligence not tailored to NLP
- User-friendliness is the goal
- No evaluation data



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD



DIRO

www.GreekEnglish.com



Manicurists or nail specialists pamper the nails on people's hands and feet. They clean, shape, strengthen, and extend nails; soothe and protect them with special treatments, paint them, and possibly adorn nails with artwork or stones. In 2008, there were 76,000 manicurists and pedicurists in the United States, according to the government's Bureau of Labor Statistics. The nail care industry reports that the number of people who seek nail salon services is increasing each year, and Americans spend billions on nail care products and services.

www.GenkiEnglish.com



Taskforce Creation

What's do you do?

www.GentleEnglish.com

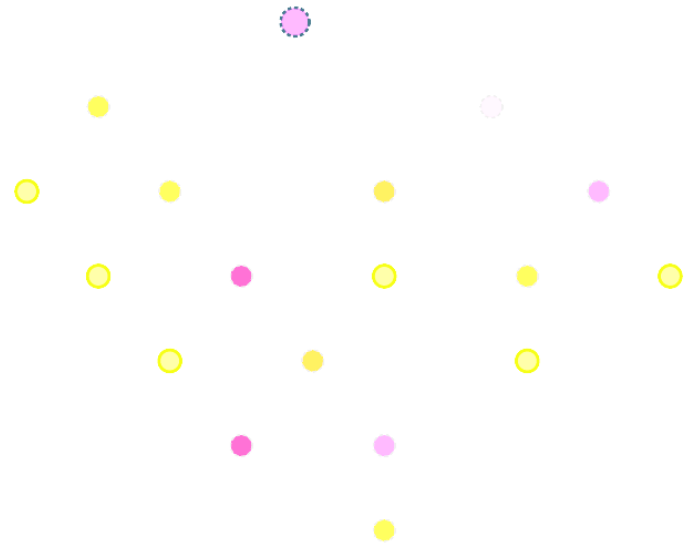


Search Engine



Zakaria, Fabrizio,
David, Samuel

Decision Tree



William, Graeme, Abbas



Une place de choix^{MD}
the co-operators
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD




DIRO

Search Engine



What do you do?



Act. Code	Act. Code Label
7297a00	Beauty parlours - no tanning beds- no laser therapy

Activity labels are augmented with:

- Expert documents
- Relevant **Wikipedia** articles (e.g. “Barber”)
- **10 relevant web pages** found through Bing (e.g. www.beautysalon.com/aboutus.html)



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

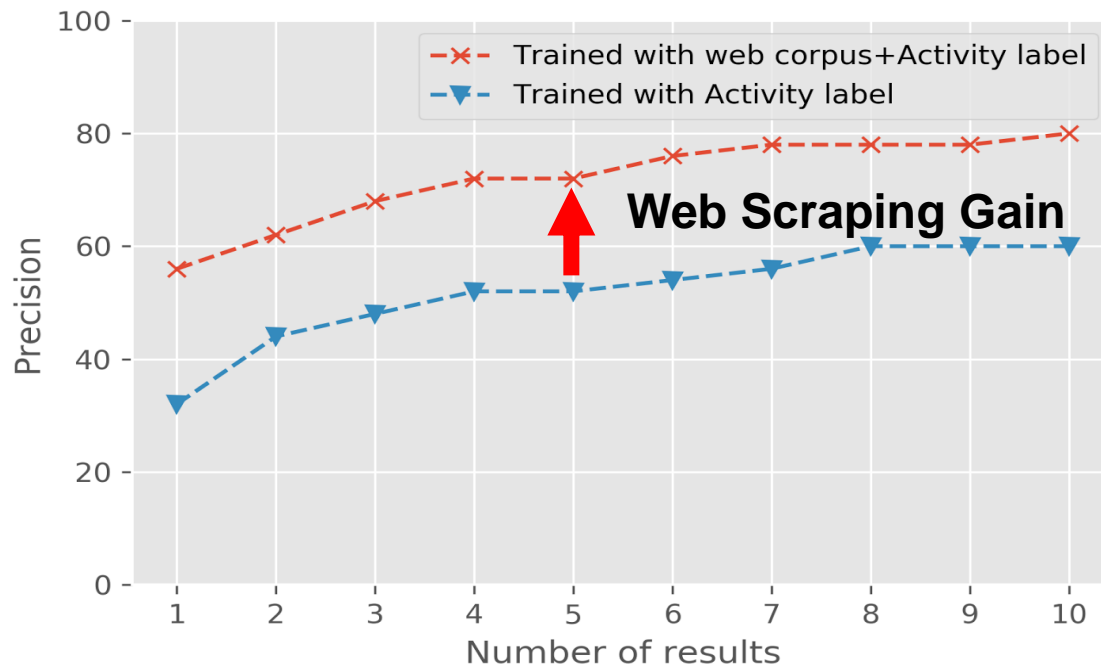


Search Engine

What's do you do?



“I have a nail salon”



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD



DIRO

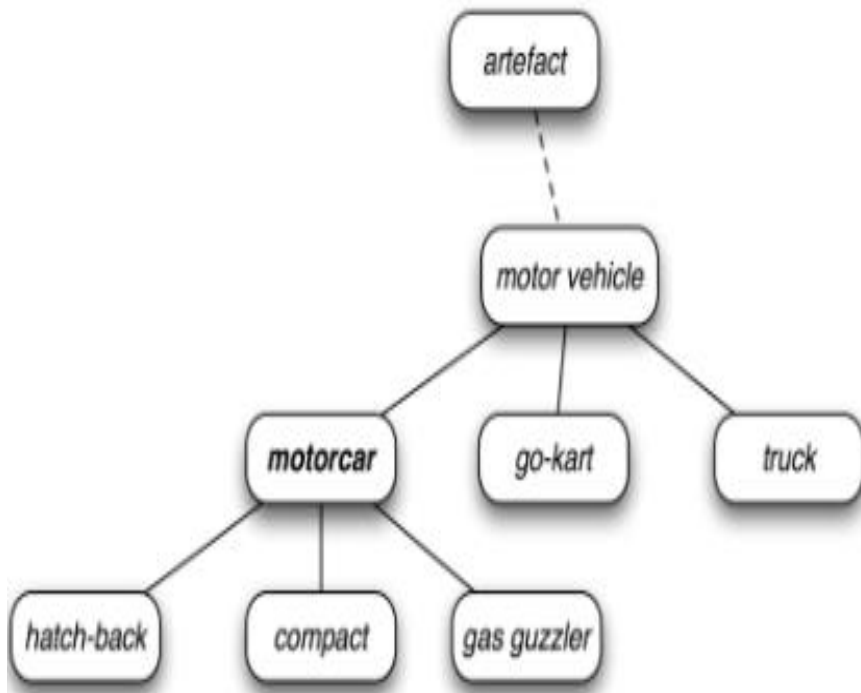
Keyword Generation

What's do you do?

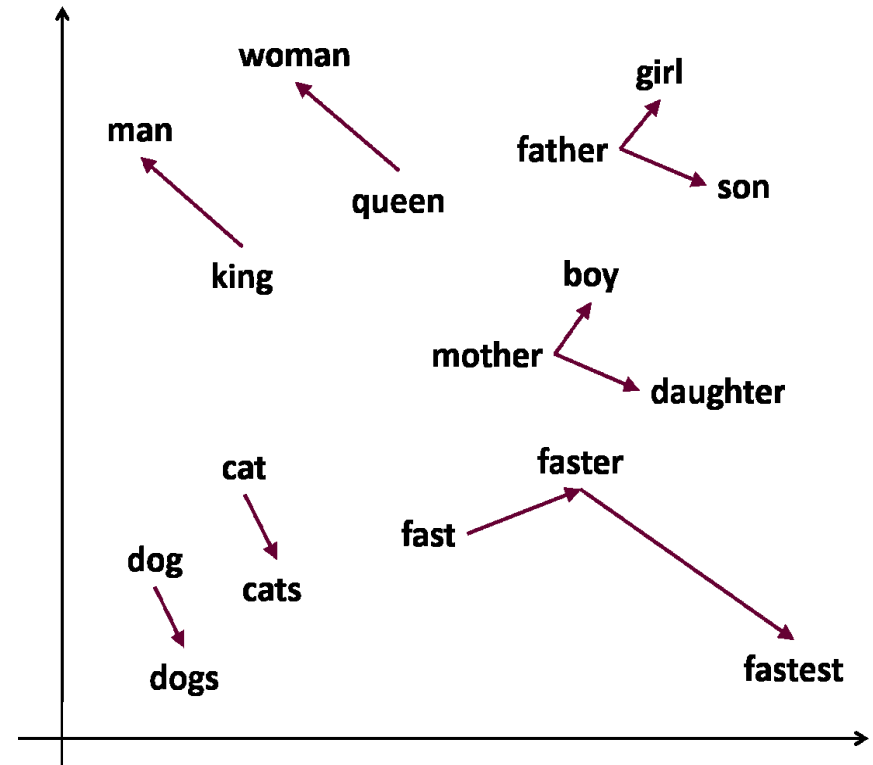
www.GentleEnglish.com



WordNet



Word2Vec



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD



DIRO



Keyword Generation

Activity Code - Description
2011a00 - Cheese Manufacturing

WordNet

Word2Vec

brie
camembert
cheddar
cottage cheese
pot cheese
farm cheese
farmer's cheese
yoghurt
whey
curd
mozzarella
dream up
fabrication
manufacture
manufacturing
formation
shaping
create



cheese
industrial
butter
cheddar
milk
industries
cheeses
factories
automotive
manufacturing
manufacture
manufacturers
cottage cheese
bacon
mozzarella
manufactures
products
machinery



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD



DIRO

www.GenkiEnglish.com

Four cartoon illustrations are shown in a row. From left to right: a blue airplane with the word 'airplane' written below it; a chef in a white hat and apron with the word 'chef' written above; a construction worker in a yellow hard hat and safety vest with the word 'worker' written below; and a teacher in a green shirt and red pants with the word 'teacher' written below.

Illustration of five people in various professions: a chef, a student, a firefighter, a doctor, and a police officer.



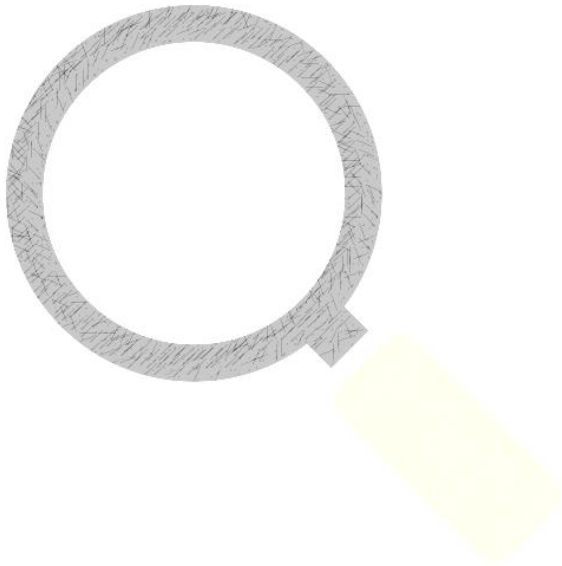
Taskforce Creation

What's do you do?

www.GentleEnglish.com

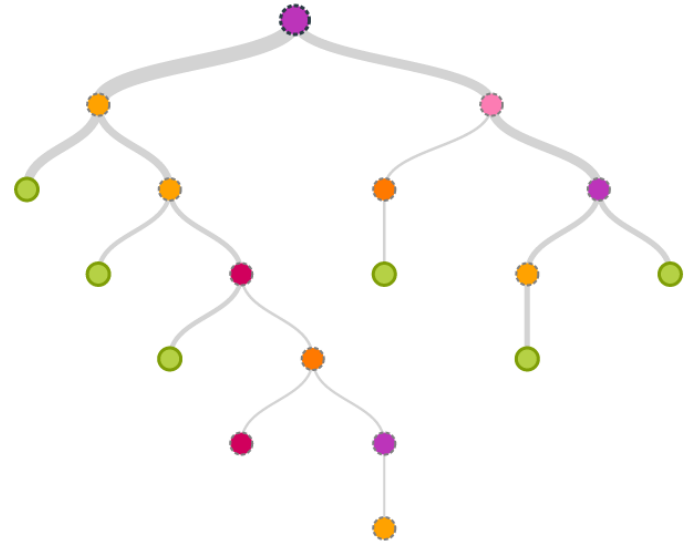


Search Engine



Zakaria, Fabrizio,
David, Samuel

Decision Tree



William, Graeme, Abbas



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]

MOVING
COMMERCIAL
FORWARD



DIRO

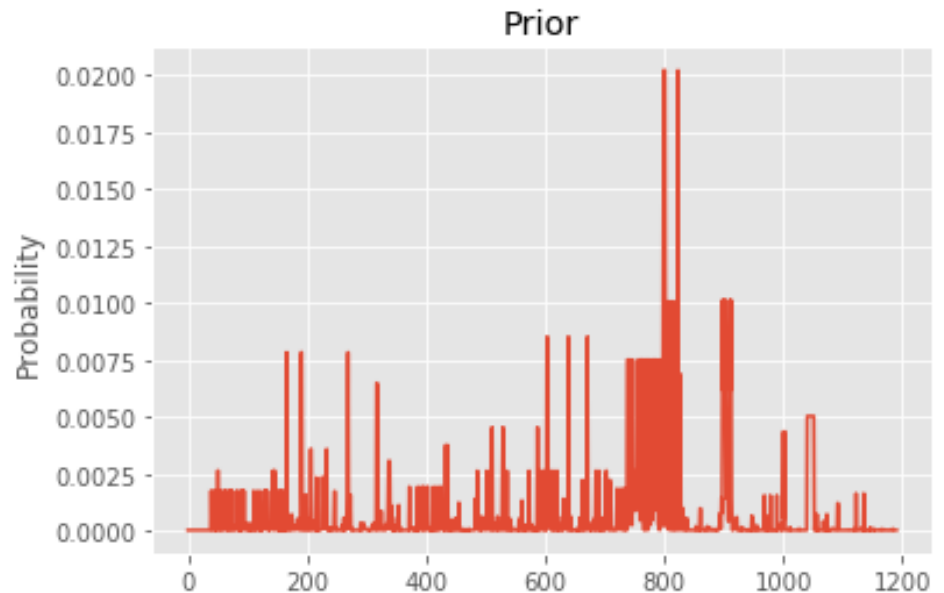
Decision Tree



With a prior distribution of activity codes

1. Ask question that has most entropy
2. Update likelihoods with answer

Until user feels confident with an answer in a shortlist



Une place de choix^{MD}
the co-operators[®]
A Better Place For You[®]



Decision Tree

What's do you do?

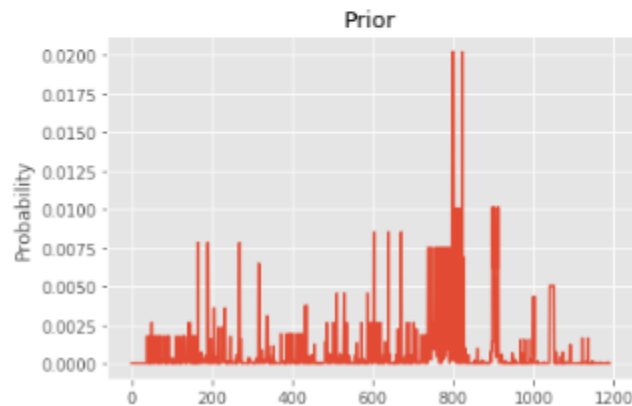
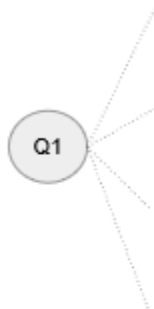
www.GentleEnglish.com



Question

Answer

What is your field?



My top guesses are:

- 2.02% Building, over 6 units/suites
- 2.02% Building, 1 or 2 units/suites
- 2.02% Building, 3 to 6 units/suites
- 2.02% Residential condominium
- 1.01% Fast food restaurant - licensed
- 1.01% Family restaurant - licensed
- 1.01% Pizzeria - licensed, incl deep frying
- 1.01% Pizzeria, no deep frying - licensed
- 1.01% Fine cuisine restaurant - licensed
- 1.01% Condominiums - No mercantile



Une place de choix^{MD}
the co-operators[®]
 A Better Place For You[®]

MOVING
COMMERCIAL
 FORWARD



DIRO



Decision Tree

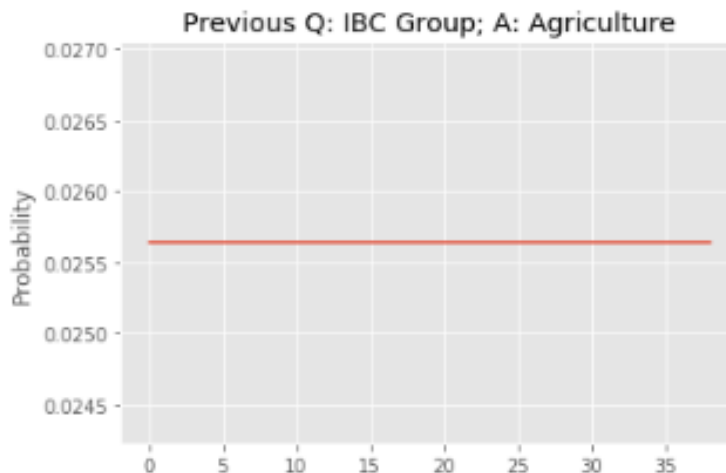
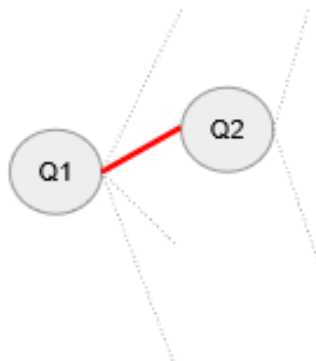
Question

Answer

What is your field?

Agriculture

Does it involve farm?



My top guesses are:

- 2.56% Agriculture, N.O.C.
- 2.56% Mushroom farms
- 2.56% Greenhouses
- 2.56% Hog farms
- 2.56% Horse farms - breeders
- 2.56% Horse farms - No breeding/board.
- 2.56% Horse farms w board - No breeding.
- 2.56% Livestock or cattle dealer
- 2.56% Mixed farms (small exposures)
- 2.56% Nurserymen, florist



Une place de choix^{MD}
the co-operators[®]

A Better Place For You[®]

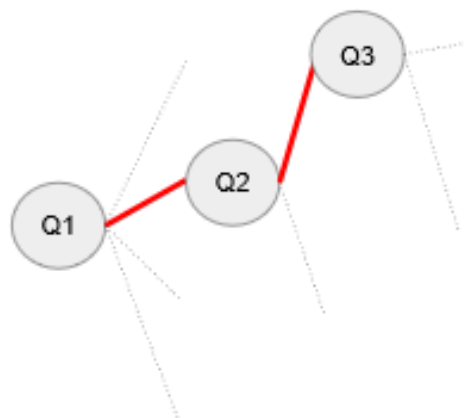
MOVING
COMMERCIAL
FORWARD



DIRO



Decision Tree



Question

What is your field?

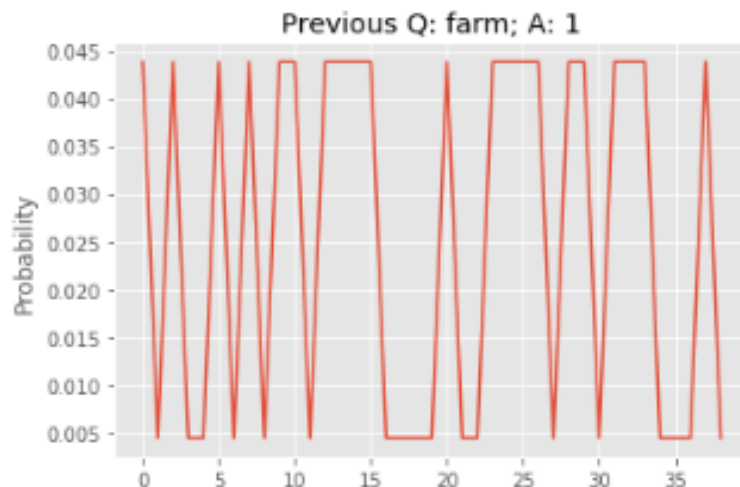
Does it involve farm?

Does it involve custom?

Answer

Agriculture

Yes



My top guesses are:

- 4.39% Agriculture, N.O.C.
- 4.39% Custom Harrowing, Rock Picking
- 4.39% Horse farms - breeders
- 4.39% Hog farms
- 4.39% Mixed farms (small exposures)
- 4.39% Fur farms
- 4.39% Mushroom farms
- 4.39% Other than animal farms - NOC
- 4.39% Peat plants (farming)
- 4.39% Dairy farming



Une place de choix^{MD}
the co-operators[®]
 A Better Place For You[®]

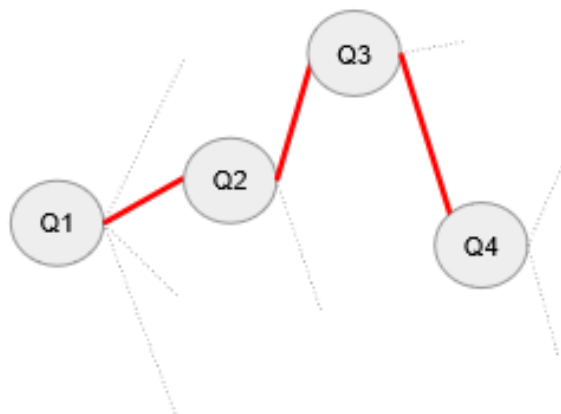
MOVING
COMMERCIAL
 FORWARD



DIRO



Decision Tree



Question

Answer

What is your field?

Agriculture

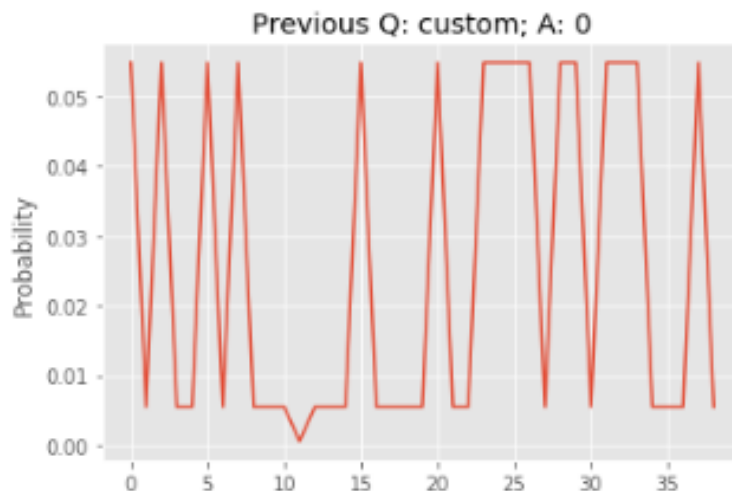
Does it involve farm?

Yes

Does it involve custom?

No

Does it involve horse?



My top guesses are:

- 5.49% Agriculture, N.O.C.
- 5.49% Peat plants (farming)
- 5.49% Fur farms
- 5.49% Horse farms - breeders
- 5.49% Horse farms - No breeding/board.
- 5.49% Horse farms w board - No breeding.
- 5.49% Dairy farming
- 5.49% Mixed farms (small exposures)
- 5.49% Mushroom farms
- 5.49% Other than animal farms - NOC



Une place de choix^{MD}
the co-operators
 A Better Place For You[®]

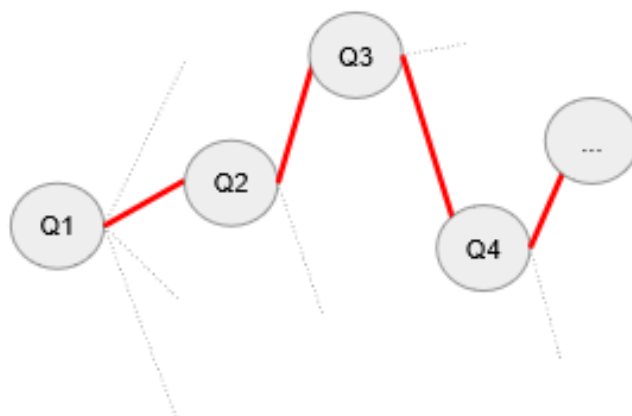
MOVING
COMMERCIAL
 FORWARD



DIRO



Decision Tree



Question

What is your field?

Does it involve farm?

Does it involve custom?

Does it involve horse?

...

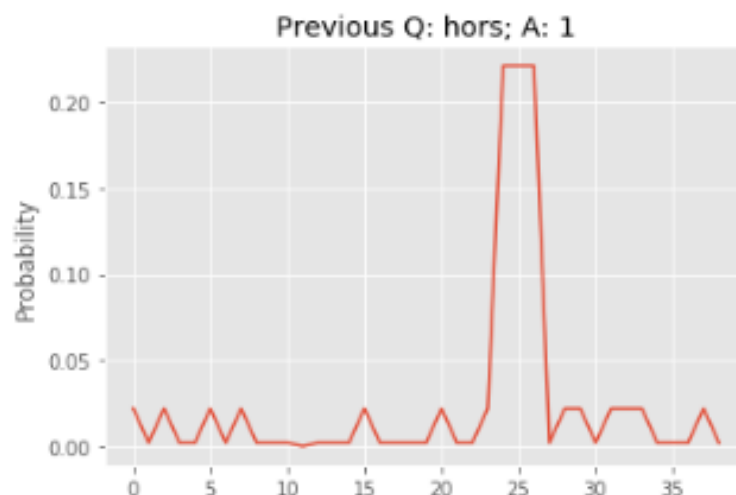
Answer

Agriculture

Yes

No

Yes



My top guesses are:

- 22.12% Horse farms - breeders
- 22.12% Horse farms - No breeding/board
- 22.12% Horse farms w board - No breeding
- 2.21% Agriculture, N.O.C.
- 2.21% Peat plants (farming)
- 2.21% Fur farms
- 2.21% Dairy farming
- 2.21% Mixed farms (small exposures)
- 2.21% Mushroom farms
- 2.21% Other than animal farms - NOC
- ...



Une place de choix^{MD}
the co-operators[®]
 A Better Place For You[®]

MOVING
COMMERCIAL
 FORWARD

