



Cortex with SAS Viya

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Get ready to teach Data Science using Cortex with SAS Viya
Online | May 18, 2023

ERPsimLab
HEC MONTRÉAL

Serious games to learn enterprise
systems and business analytics

Agenda

1. Introduction
2. Cortex with SAS Viya
3. Demo
4. Getting Started
5. Q&A

What is Cortex ?

- Cortex is a **simulation platform** that allows participants to use machine learning to make **business decisions** and get **score based** results in return, ranked amongst others in a leaderboard.
- This provides **immediate feedback** to the participants on how they perform compared to their counterparts and to their previous decisions.
- Combined with the power of **SAS Viya** results in turnkey simulation solution to challenge students in finding answers to business questions.
- Cortex can also be used with other data analysis tools (SAS EM, Python).

Cortex Analytics Simulation

Rank	Player	Operating surplus	Expenses	Donors contacted
1	Player 1	26337515.00	116000.00	58500
2	Player 2	26209155.00	103340.00	52170
3	Player 3	23411465.00	324920.00	77160
4	Player 4	23112470.00	70730.00	35865
5	Player 5	23062202.00	32148.00	16574
6	Player 6	21561163.00	55292.00	28146
7	Player 7	21012684.00	5952296.00	546108
8	Player 8	19880555.00	30.00	515
--	Baseline --	19872990.00	0.00	0
9	Player 9	19147758.00	8333372.00	744531

- Turn-key solution, includes case study, dataset, online leaderboard, tutorials
- Teaches predictive modeling concepts in an exciting and hands-on environment
- Virtual or in-class instructor tool

POWERED BY



IN COLLABORATION WITH

HEC MONTRÉAL

Prediction-Based Decision Making

- Targeted Marketing

Cortex Fundraising Scenario

- identifying individuals who are most likely to respond to a marketing action

- Financial Risk

Cortex Credit Risk Scenario

- predicting monetary events (e.g., credit default, loan prepayment)

- Customer Churn

Cortex Customer Retention Scenario

- developing models to identify potential customers who will churn soon

The Scenarios

Scenarios Features

	Fundraising Scenario	Credit Risk Scenario	Retention Scenario
Level	Beginner	Intermediate	Advanced
Datasets	✓	✓	✓
Case study	✓	✓	✓
Instructional Videos	✓	✓	✓
Pre-built Pipelines	✓	✓	✓
Teaching notes	✓		

Fundraising: Turnkey Solution

Fundraising Scenario

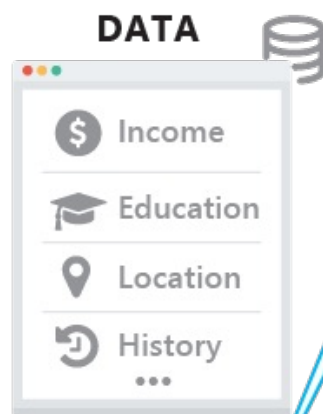
Foundation targeting potential donors

GOAL

Maximize the net raised funds



CALLING COST



DECISIONS



1 million potential donors

Credit Risk: Intermediate Level

Credit Risk Scenario

Financial institution processing car loan applications

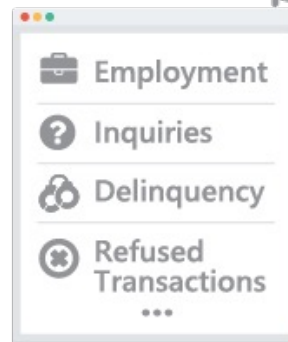
GOAL

Maximize Net Profit
after 2 years



THE PLAYER
(Lender)

DATA



DECISIONS

How many to accept?
Who to accept?
...

1 million potential borrowers



Retention: Advanced Level

Retention Scenario

Telecom company looking to retain customers

GOAL

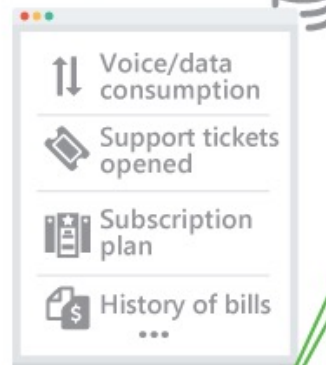
Maximize Net Profit after 2 years



THE PLAYER

Customer Relationship

DATA



DECISIONS



How many families and which ones to invite?

1 million existing subscribers

Fundraising Scenario

Fundraising: Turnkey Solution

Fundraising Scenario

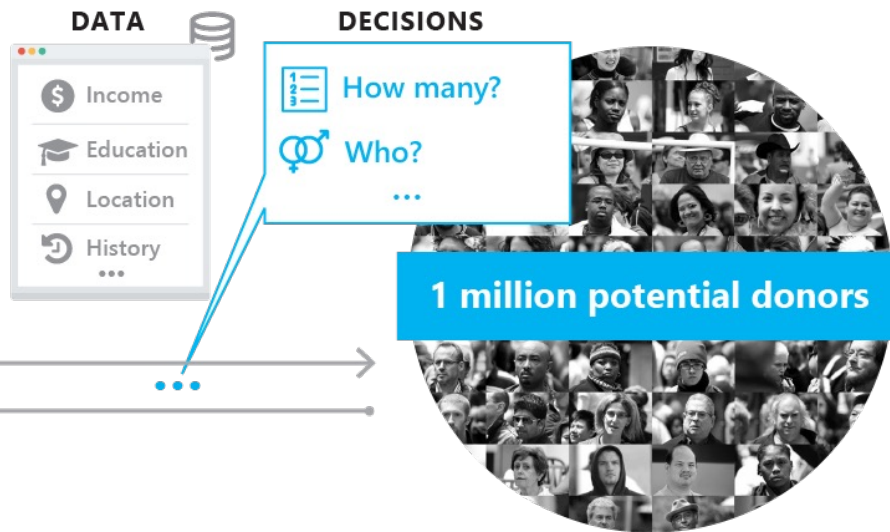
Foundation targeting potential donors

GOAL

Maximize the net raised funds

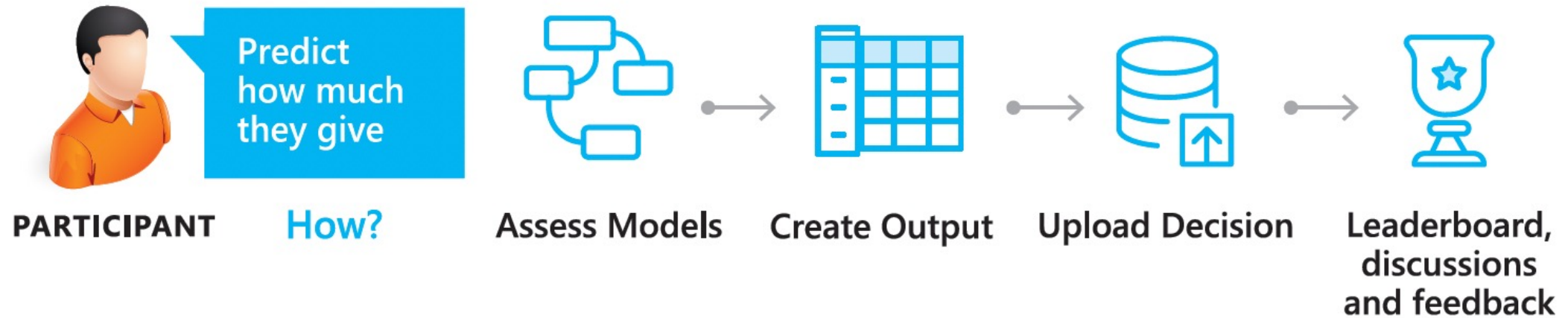


CALLING COST

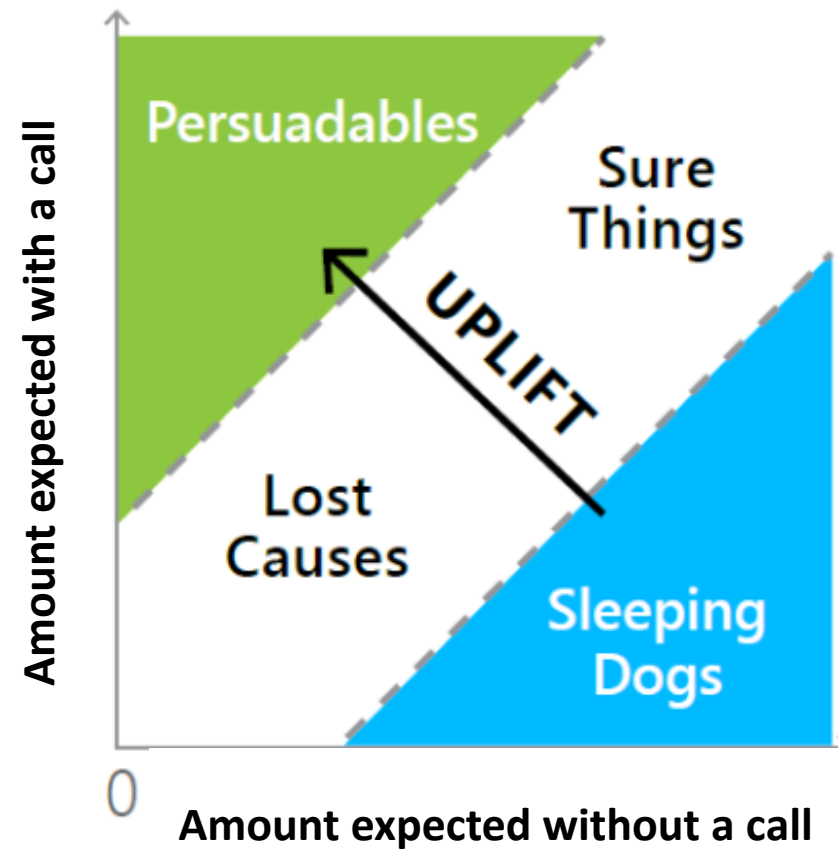


Variable Name	Description
ID	Member number (unique ID)
LastName	Last Name
FirstName	First Name
Woman	Sex (1=woman, 0=man)
Age	Age (years)
Salary	Annual salary in USD
Education	Highest education level
City	Type of neighborhood
SeniorList	Seniority for being on the VIP list
NbActivities	Number of participations to annual meeting
Referrals	Number of referrals
Recency	Number of years since last gift
Frequency	Number of donations
Seniority	Number of years since first donation
TotalGift	Total Donation since a member
MinGift	Minimum donation since a member
MaxGift	Maximum donation since on the VIP list
Contact	Direct sollicitaion this year
GaveLastYear	Did the individual give last year
AmtLastYear	Amount given last year
GaveThisYear	Did the individual give this year
AmtThisYear	Amount given this year

Round 1: Predict the amount given in the current year



Fundraising Round 2



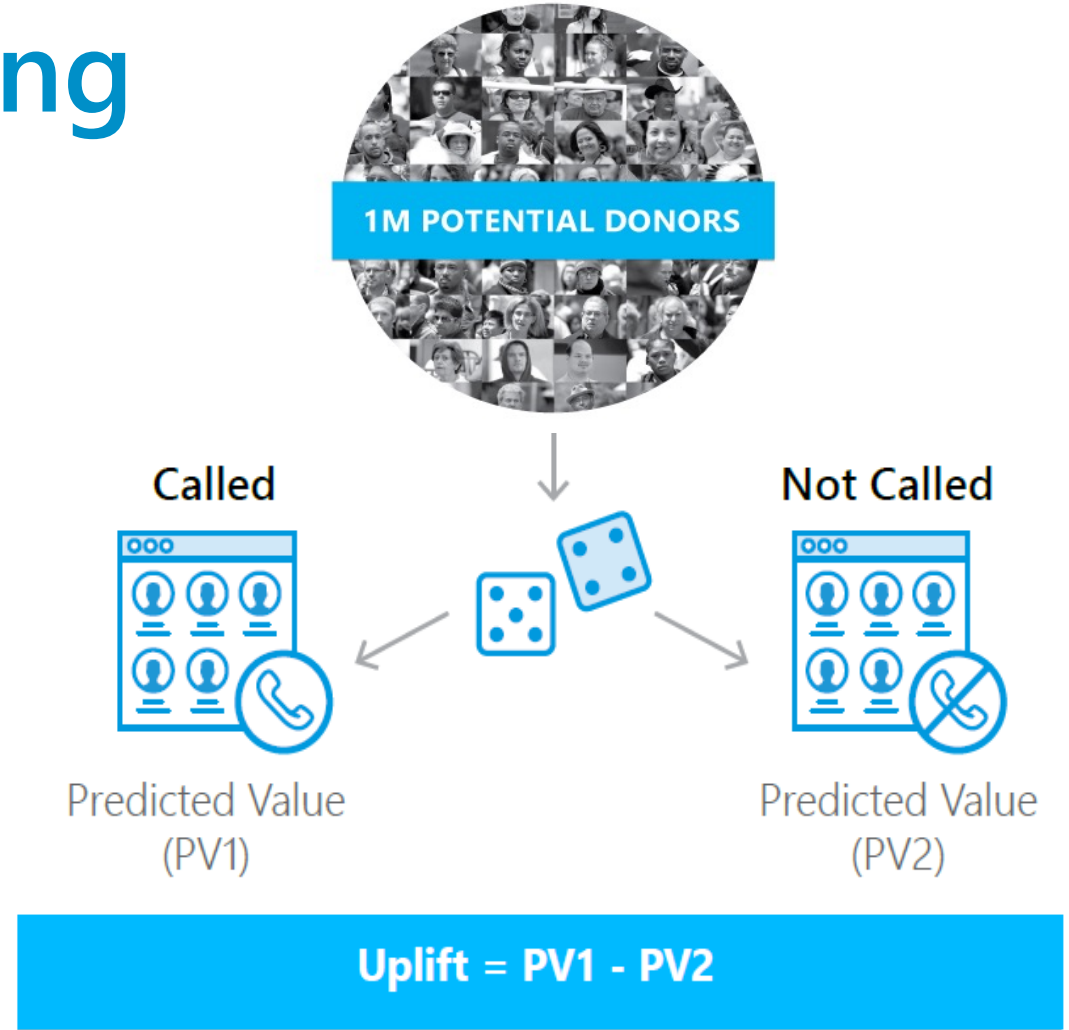
Task: Calculate the incremental value of a call

Round 2: Uplift modeling

There are many approaches to 2-stage modeling, but in most cases these steps are required:

- 1** Predict the value if a person receives a treatment (here called or contacted)
- 2** Predict the value if a person does not receive a treatment (here not called or not contacted)
- 3** Compute the difference between both (i.e. the uplift generated by the treatment or targeted action: here the call)

The Idea is to contact people who yield higher uplift (value) when called.



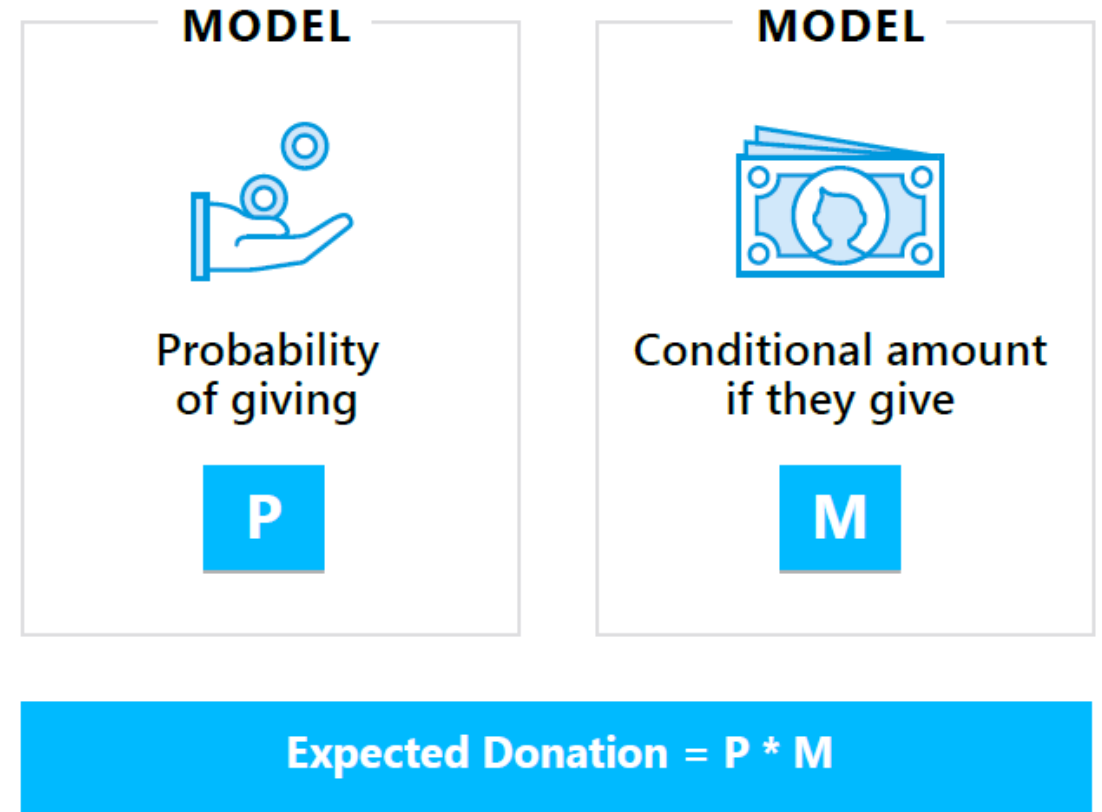
Task: Calculate the incremental value of a call

Round 2: Two-stage modeling

One way to improve your predictions is to adopt a two-stage modeling approach

To do so:

- 1** Fit a model to determine the probability **P** that an individual will give
- 2** Keeping only the data of those who gave, fit a model for **M** (the amount gave)
- 3** Use both models to make predictions on the population
- 4** Compute **P*M** to determine the 'expected donation' of each individual



Demo

Getting Started

Get Started with Cortex

Discover what Cortex has to offer, learn how to play the game, know how to manage the game for your students and get ideas on how to incorporate Cortex into your curriculum.

Register at
ersim.hec.ca/cortex/training

Online Course



Session with our team



Complete the online course
in self-study mode

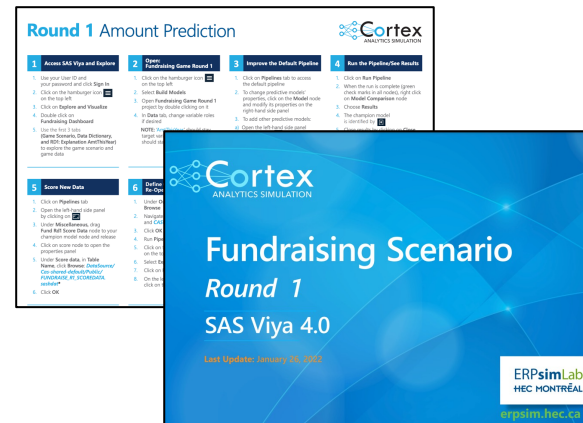
Register for a one-on-one
session with our team.
We'll answer all your questions!

Receive your certified instructor
digital badge and start using
Cortex right away!

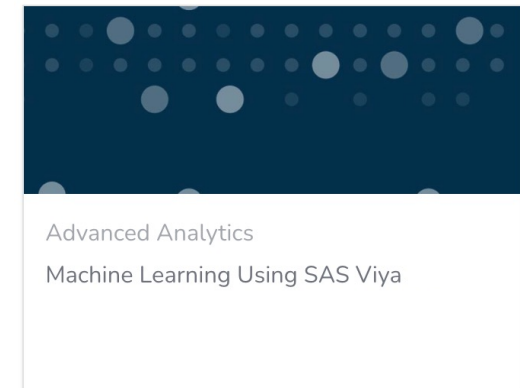
Instructional Assets and Support



Virtual Learning Environment



Instructional Documents



Extended Learning



Technical and Pedagogical Support

Price and Purchase Options

Free For Eligible Faculty Members

Cortex with SAS Viya

\$35 USD

per student*

Get the game materials and use
Cortex with SAS Viya for Learners

*multiple licenses option available

Questions

Thank You!

Website: erpsim.hec.ca/cortex

Email: cortex@hec.ca

A Complete Solution

Gamified Platform

Three scenarios where participants will design models and generate results that will be submitted for scoring, providing immediate feedback.

Instructional Assets

Ensure that students have a quick start and minimize the preparation time required by the professor.

Specialized Support

We accompany you by providing technical and pedagogical support for a seamless journey!

Why SAS?

2021 Magic Quadrant ☰



Why SAS?

Fortune 500 (2020) 91 of the top 100 companies use SAS

