Cortex
ANALYTICS SIMULATION

Gamify your Curriculum with Cortex

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Gamify your curriculum with low/no-code predictive analytics
Online | March 31, 2022

ERPsimLab
HEC MONTRÉAL
Serious games to learn enterprise systems and business analytics

Your Speakers Today

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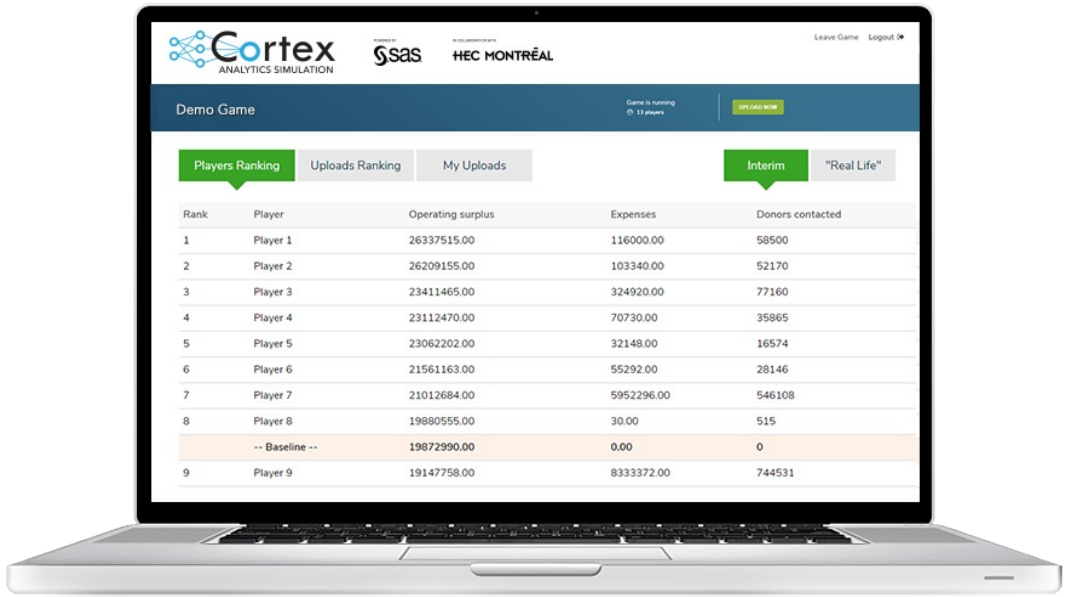
Agenda

1. Introduction
2. What is Cortex?
3. The Scenarios
4. Demo and Get started
5. Teaching with Cortex
6. Q&A

What is Cortex?

Image reference: https://referralcoach.com/bridge-the-referral-gap/

Cortex Analytics Simulation



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

POWERED BY

sas

IN COLLABORATION WITH

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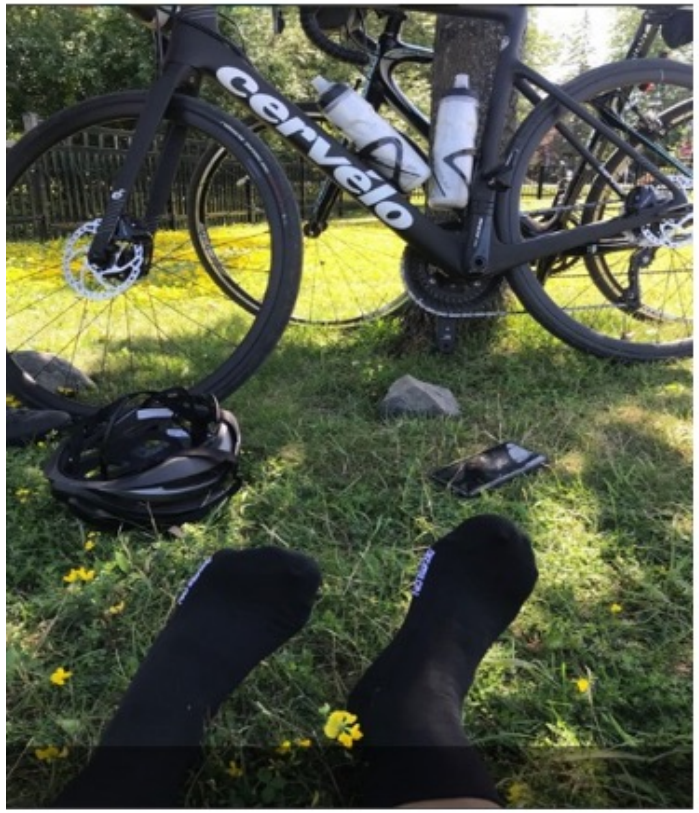
The Benefits of Gamification



Observed Benefits

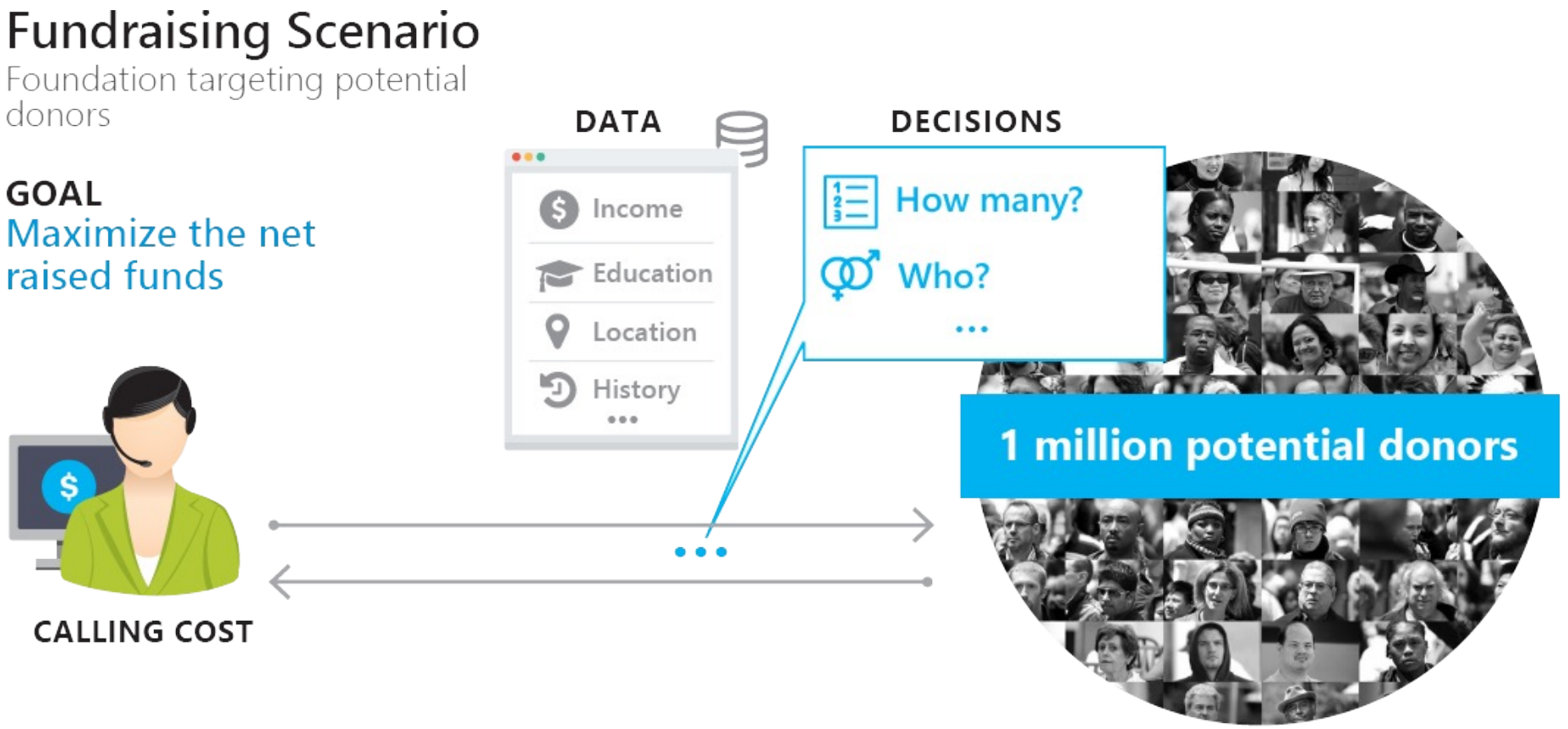
- Increased engagement
- Desire from students to know more
- A surge in the number of hours willingly spent by students for the course
- Risen awareness of students in the feedback session

The Scenarios

Scenarios Features

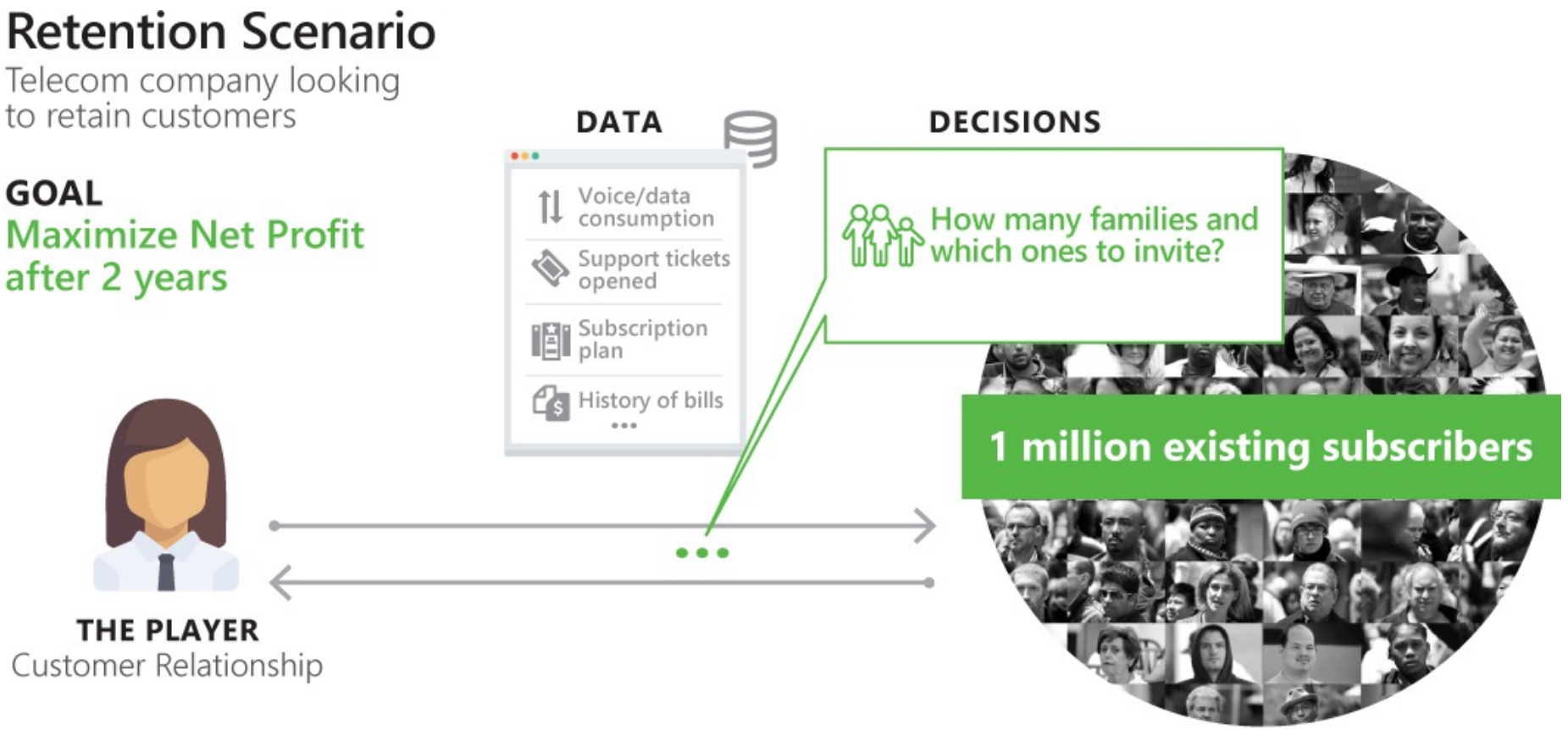
	Fundraising Scenario	Credit Risk Scenario	Retention Scenario
Level	Beginner	Intermediate	Advanced
Datasets	✓	✓	✓
Case study	✓	✓	✓
Instructional Videos	✓	✓	
Pre-built diagrams	✓		
Teaching notes	✓		
Software	EM, Studio, Python	EM	EM

Fundraising: Turnkey Solution



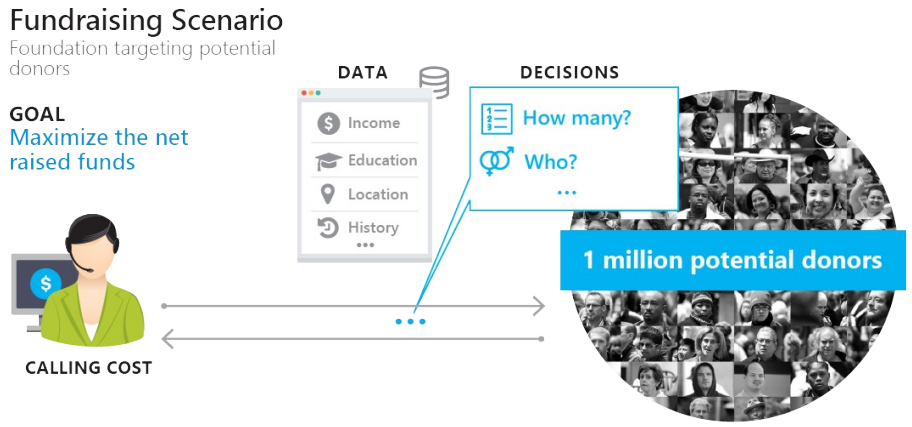
Credit Risk: Intermediate Level

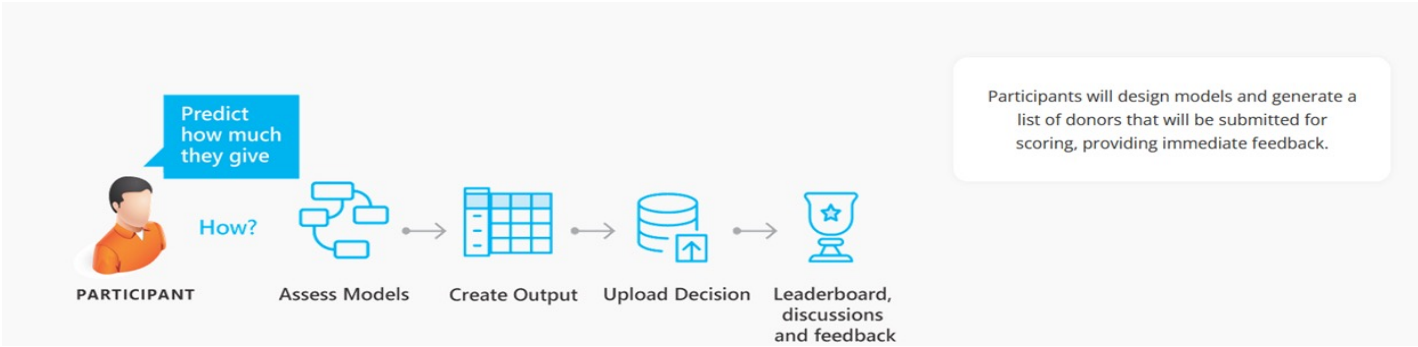
Retention: Advanced Level



A Closer Look at the Fundraising Scenario

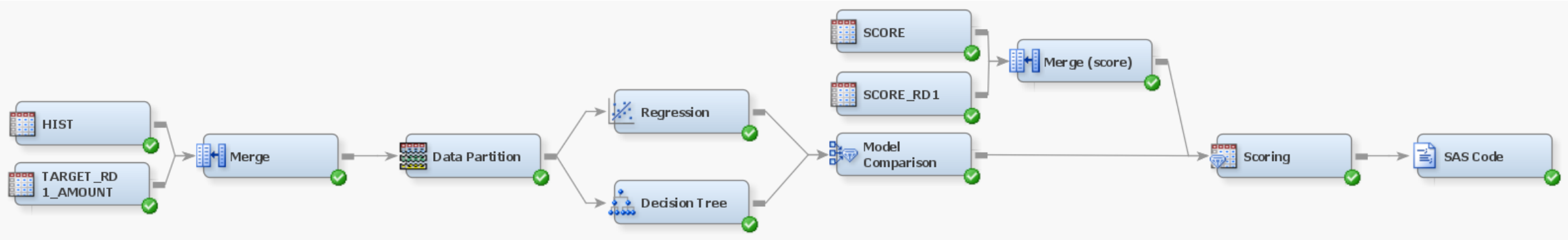
Fundraising: Turnkey Solution





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 neighborhgood
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

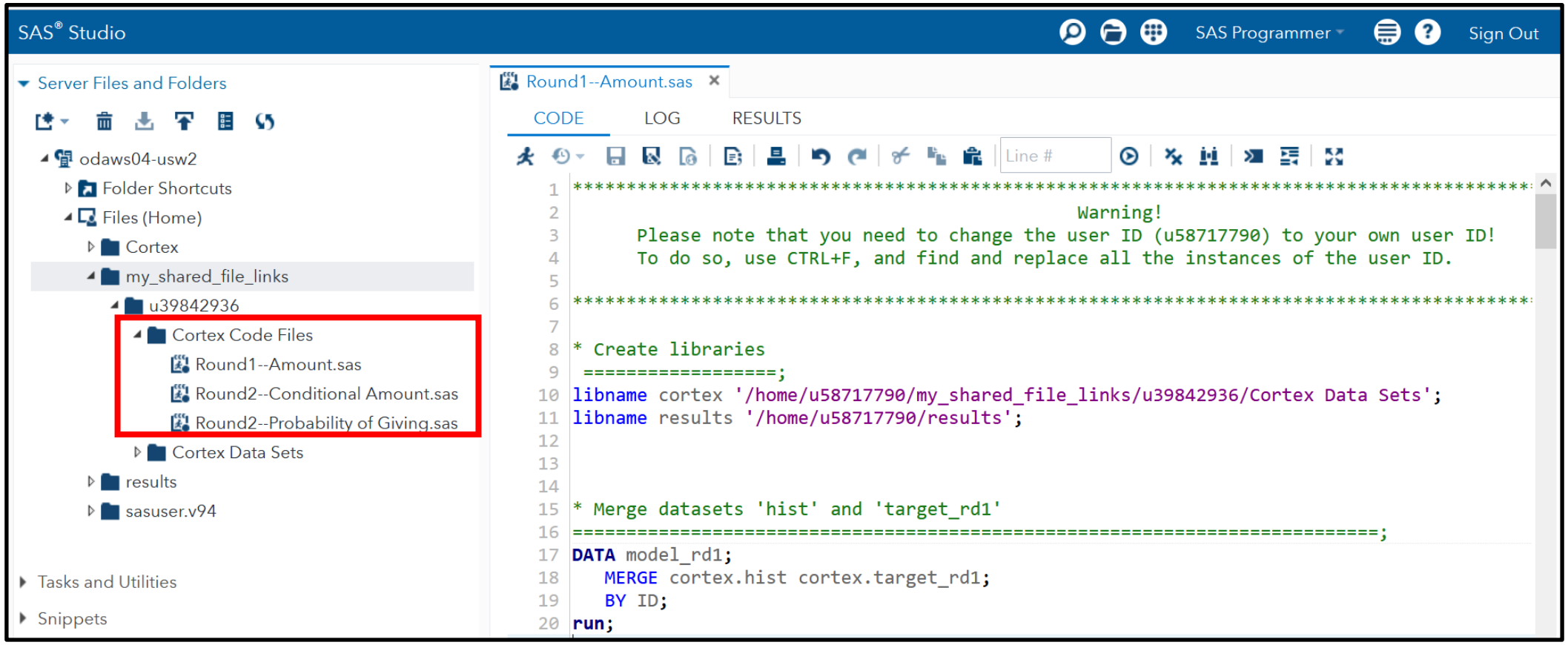
Round 1 - SAS EM:
Predict the amount given in the current year



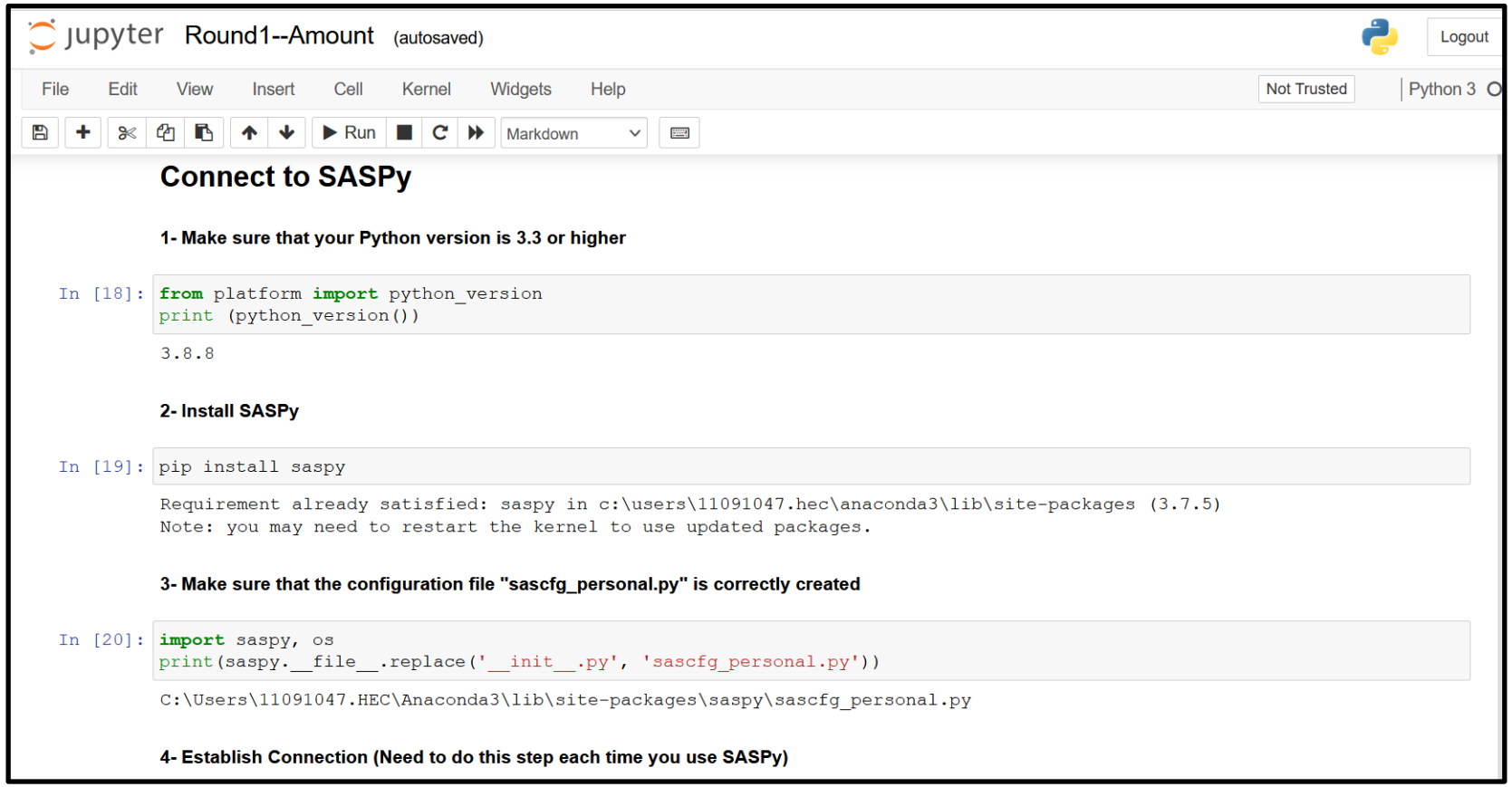
Players Ranking | Uploads Ranking | My Uploads | Interim | "Real Life"

Rank	Player	Operating surplus	Expenses	Donors contacted	Method	Uploads #	Selected
	-- Baseline --	$7,602,655.00	$0.00	0	-- Baseline --	0	Selected

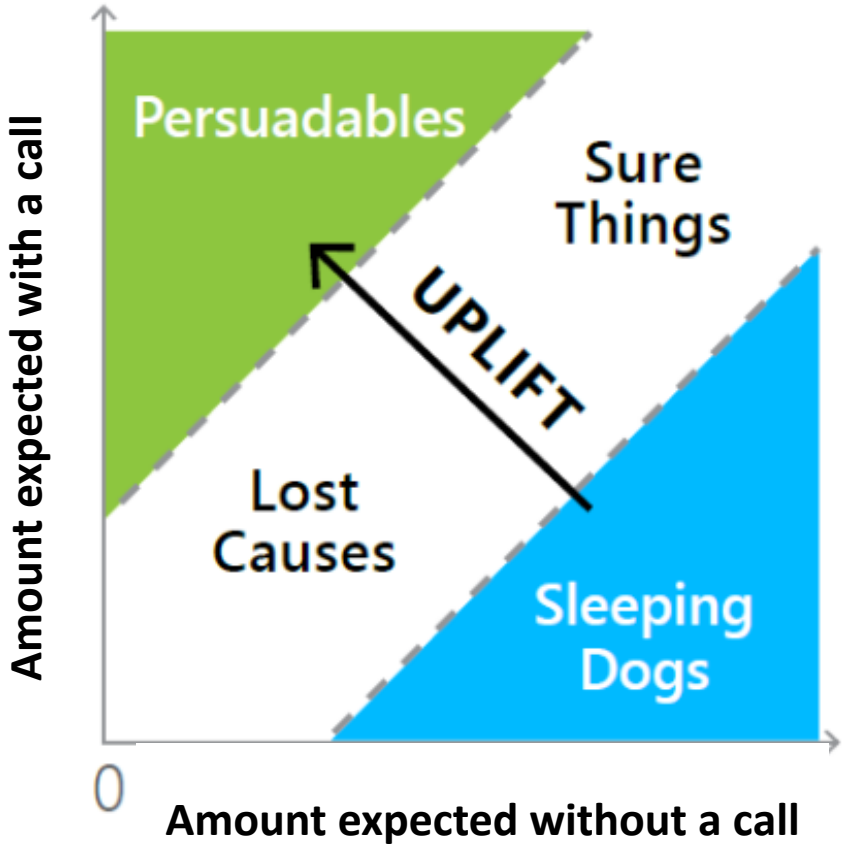
Round 1 - SAS Studio:
Predict the amount given in the current year



Round 1 - SAS Python:
Predict the amount given in the current year



Fundraising Round 2



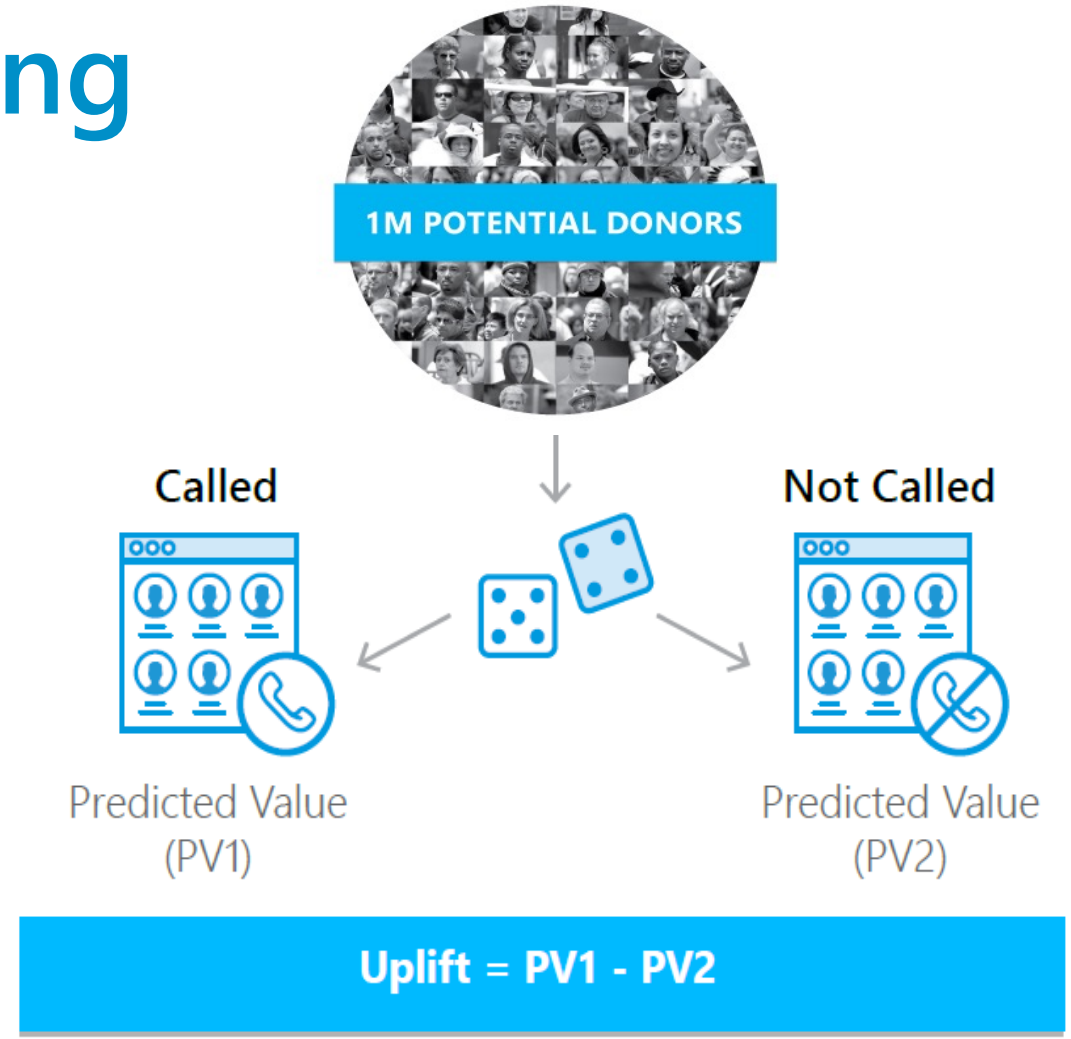
Task: Calculate the incremental value of a call

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

MODEL

Probability of giving

P

MODEL

Conditional amount if they give

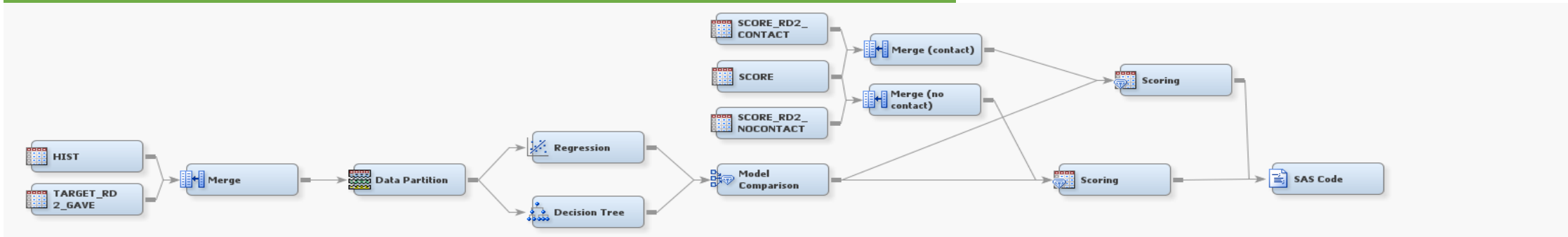
M

Expected Donation = P * M

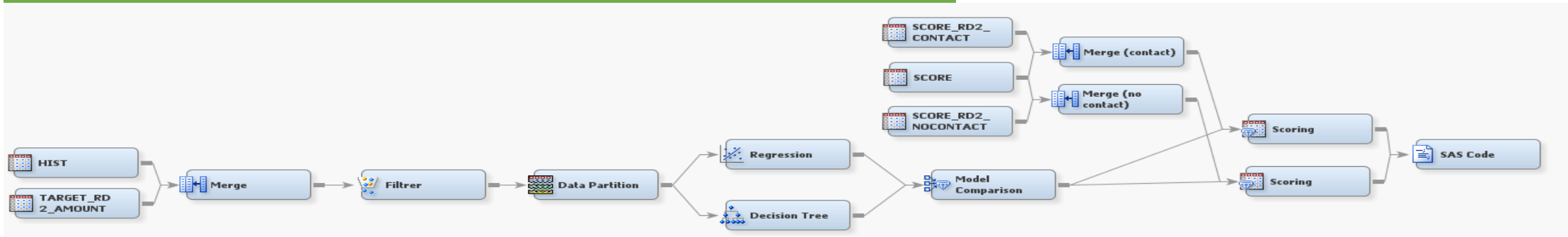
Tasks: Predict the Probability and Conditional Amount

Round 2: Uplift Modeling

Stage 1: *predict the probability of giving*



Stage 2: *predict the conditional amount*



Game Demonstration

How to get started with Cortex

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
erpsim.hec.ca/cortex/training

Online Course

Complete the Online Course in self-study mode

+

Session with our team

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

=

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

Purchase Options

	Cortex using SAS® Enterprise Miner	Cortex Desktop	Cortex using SAS and Python
Game Materials and Leaderboard	✓	✓	✓
Available Scenarios	Fundraising, Credit Risk, Customer Retention	Fundraising, Credit Risk, Customer Retention	Fundraising
Software Access	20 hours of software in the cloud	Bring your own install of SAS Enterprise Miner	SAS OnDemand for Academics and Python
Price	**$100**	**$50**	**$35**

https://www.sas.com/en_us/learn/academic-programs/resources/cortex-analytics-simulation-game.html

Teaching with Cortex

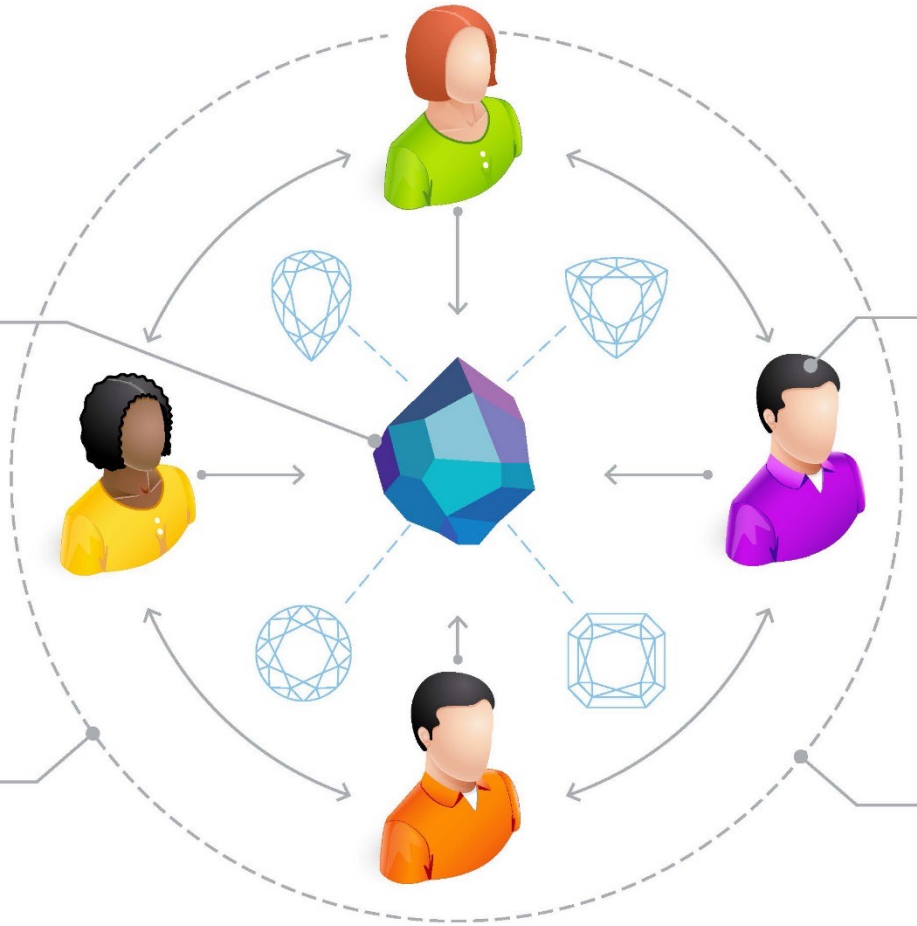
Active Learning

Problem Based Learning Approach

Léger, P. M., Cronan, P., Charland, P., Pellerin, R., Babin, G., & Robert, J. (2012). Authentic OM problem solving in an ERP context. International Journal of Operations & Production Management, 32(12), 1375-1394.

AUTHENTICITY
Realistic situations

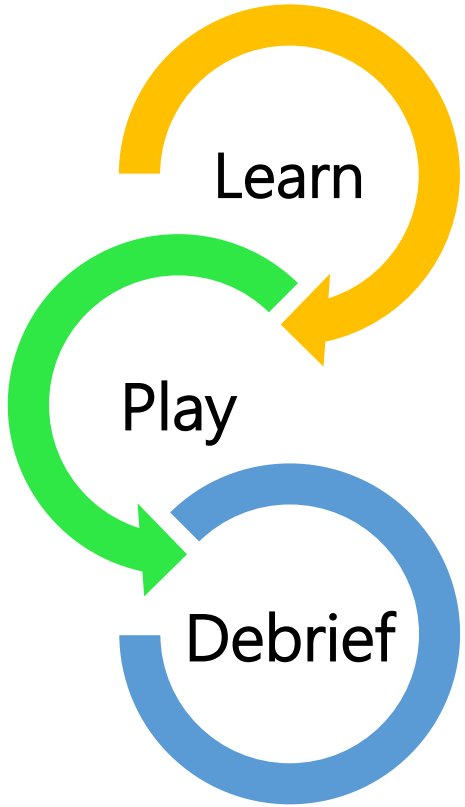
TEACHER
acts as facilitator or tutor



STUDENT CENTERED APPROACH

COMPETITIVE ENVIRONMENT

How to play the game?



Thank You!

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Questions