



Summary of the contest

- ★ Academic contest open to **multiple Master programs** in Romania (1st and 2nd year students), in the area of Data Science / Machine Learning / Econometrics, including but not limited to:
 - ASE Cibernetica – all masters
 - Universitatea Bucuresti – **Master Data Science**
Master Artificial Intelligence
Master Probabilitati si Statistica in Finante
 - Univ Babes-Bolyai Cluj – **Master Econometrie si Statistica Aplicata**
 - Univ A.I. Cuza Iasi – **Master Data Mining (Cibernetica si Statistica)**
 - Universitatea de Vest Timisoara – **Master Big Data (data science, analytics and technologies)**

- 🏆 Students are given a **real-world professional assignment** and will be assessed jointly by their Professor and by a jury of Deloitte & BT professionals.

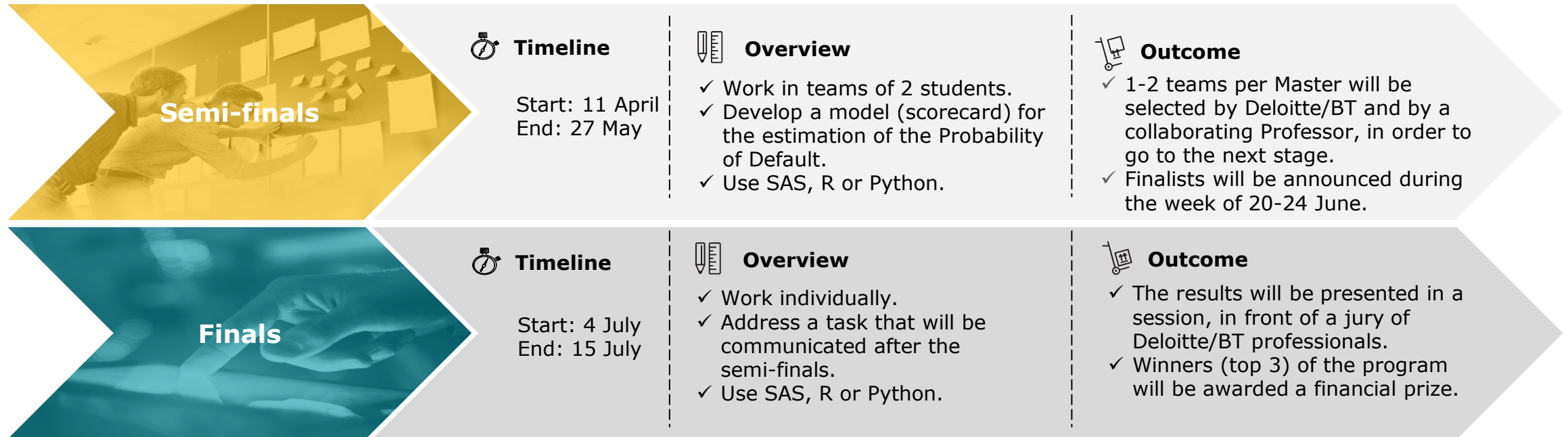
- 🏆 The outcome of the program for students include **financial awards** for top 3 participants (below the net amounts), as well as multiple invitations for collaboration (**hiring**) in the Risk Advisory team at Deloitte and with the Partner Bank:

🏆 1st place: **€2000**

🏆 2nd place: **€1500**

🏆 3rd place: **€1000**

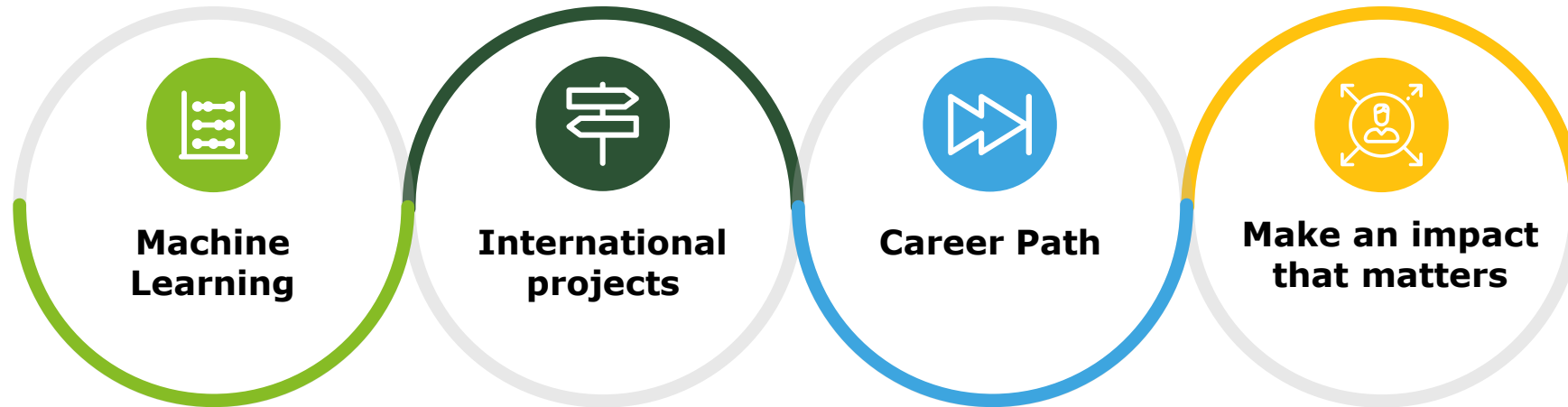
Timeline



Main objectives of the program



For students: why Deloitte



Machine Learning

- Apply cutting edge **machine learning** methods in Finance.
- Gain solid knowledge of **credit risk** in finance, as well as financial regulations.
- Apply programming tools such as **SAS, R and Python**.

International projects

- The Romanian branch is very well integrated into the wider **Central/Eastern-Europe Deloitte hub**.
- Most of our projects are **international assignments**, where we collaborate with Deloitte teams and Client teams from other countries: UK, Italy, Slovakia, Denmark, Lithuania, Bulgaria, Slovenia, Albania, Kazakhstan, etc.

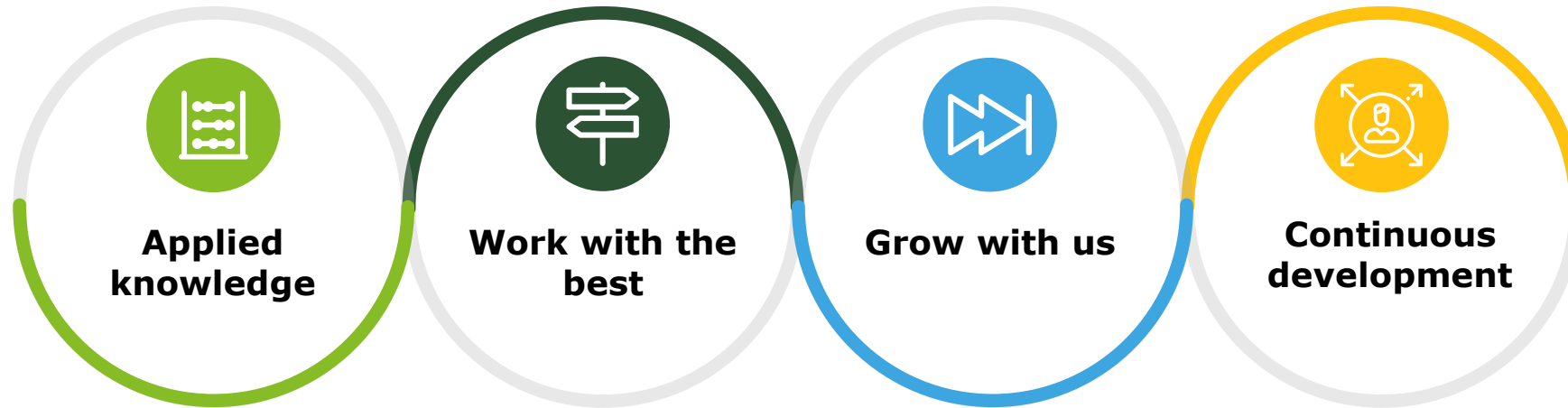
Career Path

- At Deloitte we offer a **clear career path**, where you will be followed by a **mentor** and given a transparent roadmap with career **milestones and objectives**.
- We look out for one another and prioritize **respect, fairness, development, and well-being**.

Make an impact that matters

- **Deloitte** is not only leading the profession but reinventing it for the future. We're also committed to creating **opportunity** and **leading the way**.
- We approach our work with a **collaborative mindset**, teaming across businesses, geographies, and skill sets to deliver **tangible, measurable, attributable impact**.

For students: why Banca Transilvania



Applied knowledge

- Apply the statistic, econometric and machine learning techniques on **real data**.
- Use some of the most popular programming environments such as **SAS or R**.

Work with the best

- Take the opportunity to work with **the largest and one of the most dynamic banks** on the Romanian market.
- Face the **challenges** of the financial sector and find **optimal solutions** to them.

Grow with us

- Join a team of **professionals** which act based on principles such as **knowledge sharing, respect, fairness**.
- Unite forces within a **powerful team** in order to obtain the best outcome.

Continuous development

- **Be part** of the risk mitigation process and help prevent **significant** unexpected losses.
- Continuously develop **your skills** and **knowledge**, both quantitative and financial.

Assignment

- Database: information on clients of a Bank. It will be provided prior to the start date, via a Deloitte Shared Server.
- Target variable to be modeled: binary flag (1/0) indicating if the client goes in default in the next 12 months.
- Main task (“**the semi-finals**”): Develop a statistical model for the estimation of the Probability of Default of these banking clients.
 - The model can be developed in SAS, R or Python.
 - The exercise will take place in teams of 2 students.
 - Possible models deployed: logistic regression, decision tree, machine learning methods (exp: neural networks, SVM, gradient boosting, etc.). For machine learning, provide explanation of relation between risk drivers and target.
 - Ideas of steps to be followed:
 - Dataset construction and assessment of data quality: missing values analysis, outlier values treatment, creation of risk drivers for the model based on initial variables;
 - Correlation analysis risk drivers vs target; multicollinearity assessment between risk drivers;
 - 🏆 Bonus points for discretizing continuous risk drivers into discrete (qualitative) variables;
 - Generate training and validation samples;
 - Generate training model and assess model performance on the training dataset;
 - Assess model performance on the validation dataset;
 - 🏆 Bonus points for generating a second “alternative” model using different modeling technique (for example if main model is logistic regression and alternative model is decision tree);
 - Prepare model documentation (minimum 5 slides in PowerPoint).
- Additional task (“**the finals**”): will be communicated to qualified students after the semi-finals.

Evaluation

The analyses will be evaluated by a jury consisting of Deloitte and Banca Transilvania professionals.

Different criteria will be evaluated:



Model predictability

- Measured by Gini coefficient.

➤ Objective measure

30%



Quant bonus points

- 15%: Discretizing continuous risk drivers.
- 15%: Alternative model.

➤ Semi-objective measure

30%



Quality of deliverables

1. Presentation: comprehensive presentation of steps and conclusions (PPT and analytical results);
2. Technical implementation: clean, functional and efficient codes that a third party can rerun to obtain the same results.

➤ Subjective measure

40%

Inscriptions



- For inscriptions, please send to vteleaba@deloittece.com one e-mail per team with the table below filled for the 2 team members:

| | Team member 1 | Team member 2 |
|---------------|---------------|---------------|
| First name | | |
| Last name | | |
| Email address | | |
| University | | |
| Master | | |

- Inscriptions will be open during the interval 1 – 29 April.
- The database and model assignment will be made available through a dedicated server (“the SharePoint”):
 - <https://internal.eu.deloitteonline.com/sites/QuantOlympics22/SitePages/Home.aspx>
- Deloitte Project Manager for all questions: vteleaba@deloittece.com
- Banca Transilvania Project Manager for all questions: andrei.rusu@btrl.ro

Submission of results



- Results will be delivered through the SharePoint:
 - <https://internal.eu.deloitteonline.com/sites/QuantOlympics22/SitePages/Home.aspx>
- For the first stage (the semi-finals), each team of 2 students will find on the Sharepoint a dedicated folder of the team, where all results will need to be uploaded before the deadline. Each team will have access only to its allocated folder.
- All results need to be submitted in English and will need to include:
 - Programming codes used to generate the results and that a member of the Jury could rerun to check consistency.
 - Analytical files (i.e., excels) presenting each step of the modeling project.
 - Documentation (i.e., PPT of minimum 5 slides) summarizing model results.



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Banca Transilvania is the largest bank in Romania and the main financier of the economy, covering all the client segments and business lines within the financial sector. With a story dating back almost 30 years, BT now has a market share of over 19%, 3.4 million clients, more than 9,000 employees, online banking solutions and 500 units in 180 cities. It is the only Romanian banking brand that is part of the Brand Finance Banking 500 (2022). Driven by more than just banking, BT wants to have a positive impact in Romania, both for the people and for the business and the environment.