



Math.Biz 2024 REPORT

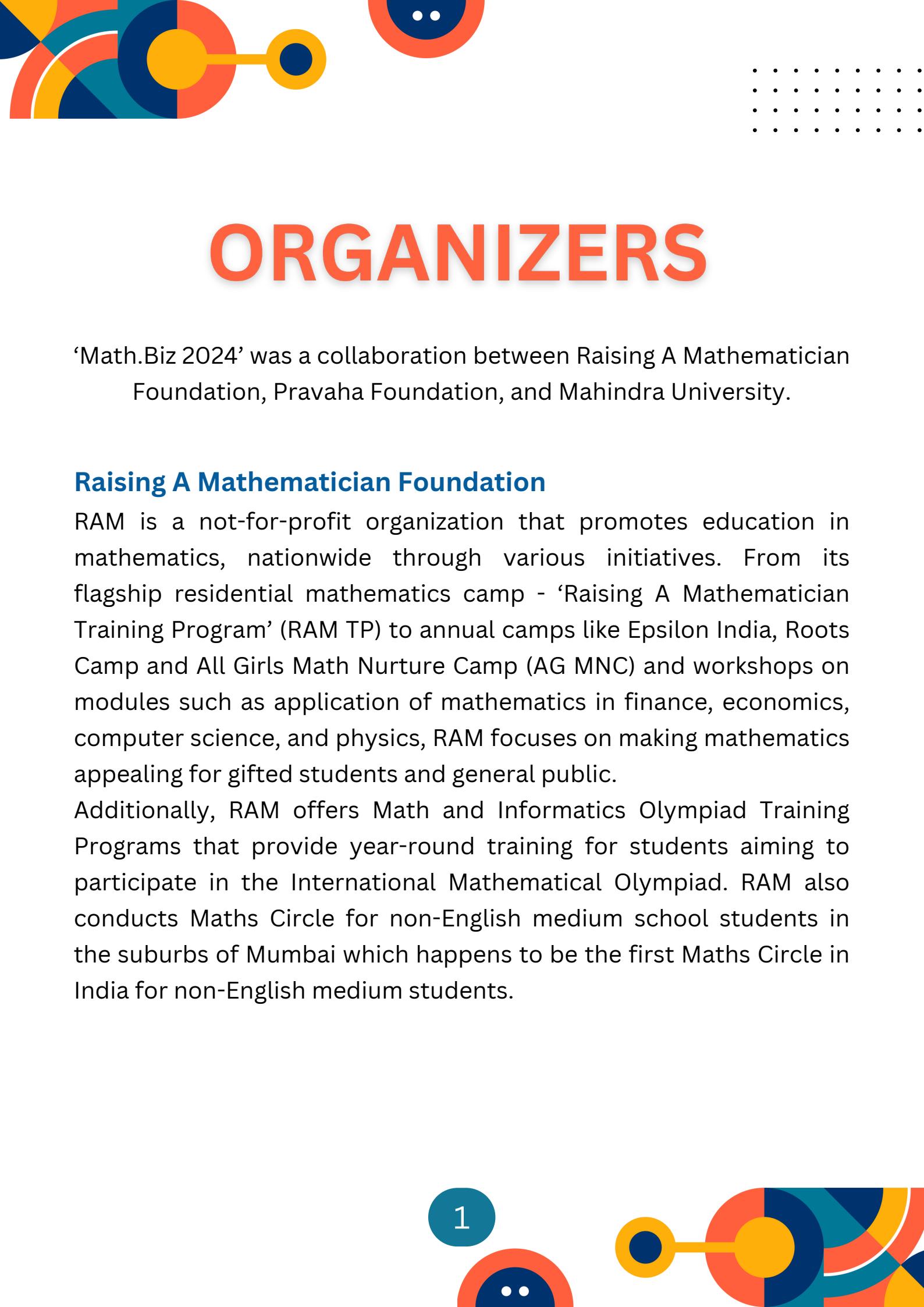


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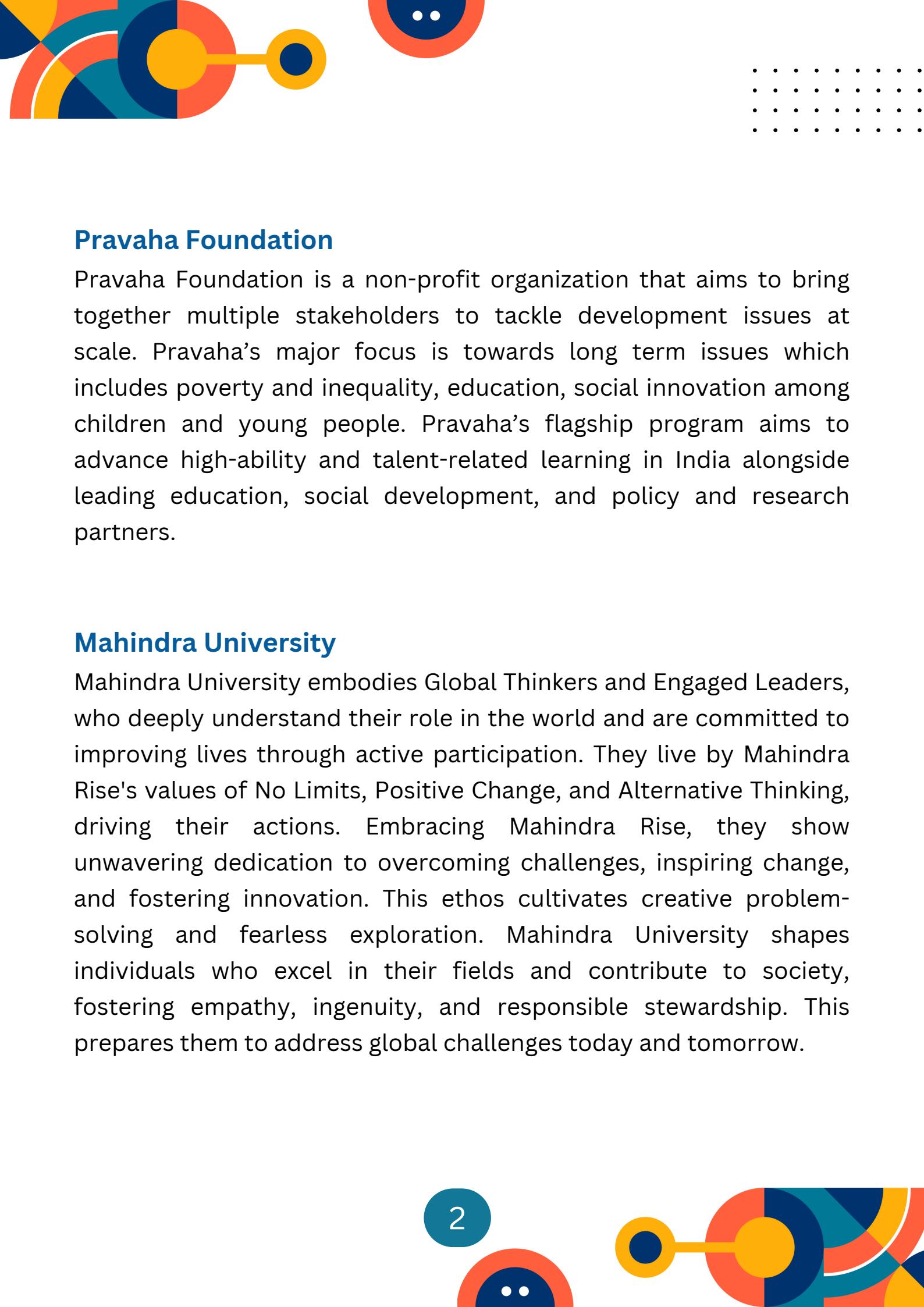
ORGANIZERS

‘Math.Biz 2024’ was a collaboration between Raising A Mathematician Foundation, Pravaha Foundation, and Mahindra University.

Raising A Mathematician Foundation

RAM is a not-for-profit organization that promotes education in mathematics, nationwide through various initiatives. From its flagship residential mathematics camp - ‘Raising A Mathematician Training Program’ (RAM TP) to annual camps like Epsilon India, Roots Camp and All Girls Math Nurture Camp (AG MNC) and workshops on modules such as application of mathematics in finance, economics, computer science, and physics, RAM focuses on making mathematics appealing for gifted students and general public.

Additionally, RAM offers Math and Informatics Olympiad Training Programs that provide year-round training for students aiming to participate in the International Mathematical Olympiad. RAM also conducts Maths Circle for non-English medium school students in the suburbs of Mumbai which happens to be the first Maths Circle in India for non-English medium students.



Pravaha Foundation

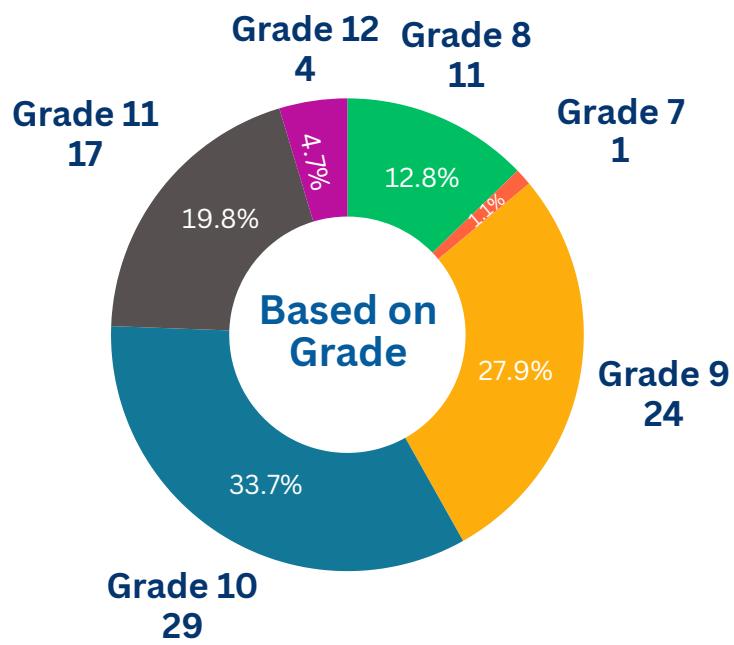
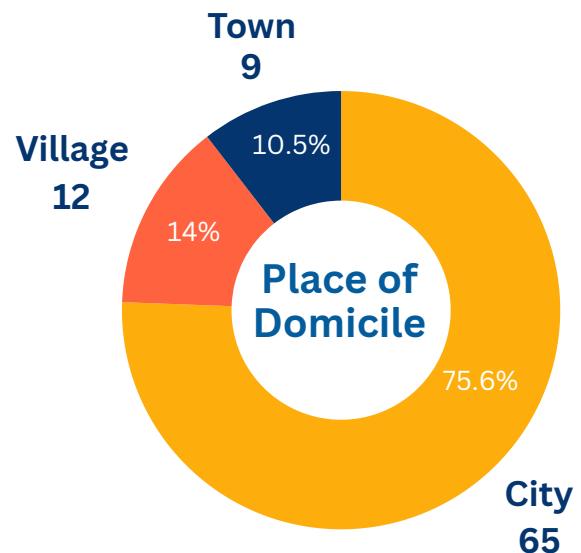
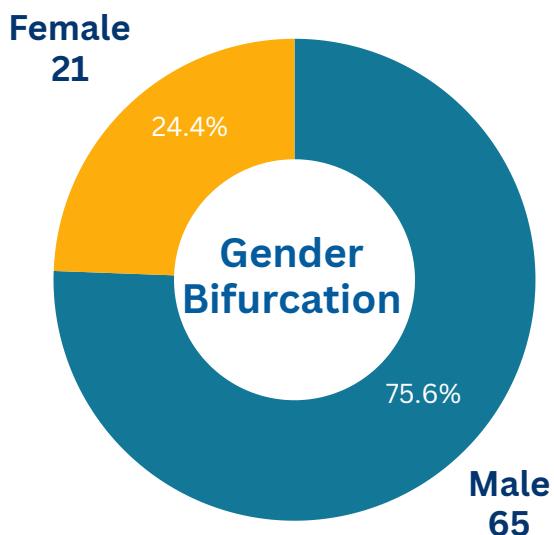
Pravaha Foundation is a non-profit organization that aims to bring together multiple stakeholders to tackle development issues at scale. Pravaha's major focus is towards long term issues which includes poverty and inequality, education, social innovation among children and young people. Pravaha's flagship program aims to advance high-ability and talent-related learning in India alongside leading education, social development, and policy and research partners.

Mahindra University

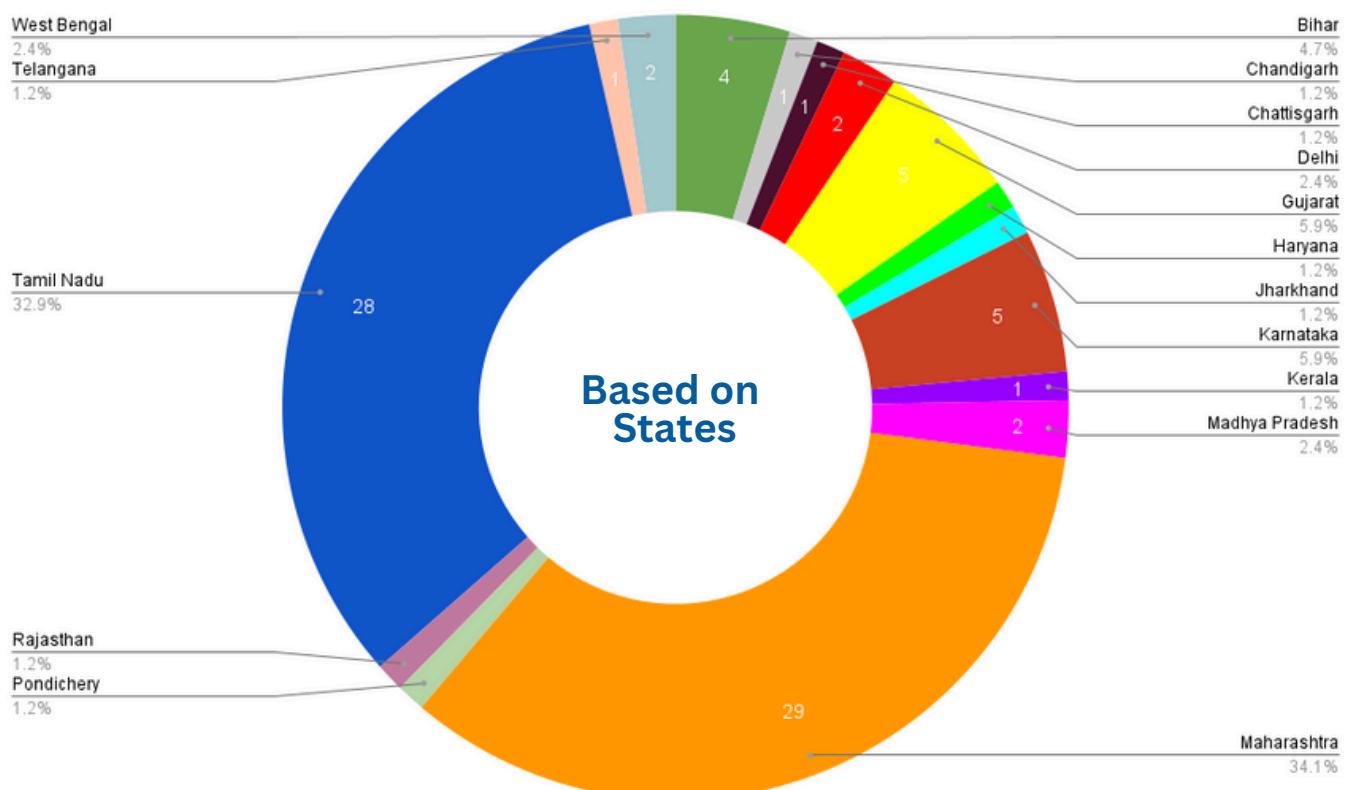
Mahindra University embodies Global Thinkers and Engaged Leaders, who deeply understand their role in the world and are committed to improving lives through active participation. They live by Mahindra Rise's values of No Limits, Positive Change, and Alternative Thinking, driving their actions. Embracing Mahindra Rise, they show unwavering dedication to overcoming challenges, inspiring change, and fostering innovation. This ethos cultivates creative problem-solving and fearless exploration. Mahindra University shapes individuals who excel in their fields and contribute to society, fostering empathy, ingenuity, and responsible stewardship. This prepares them to address global challenges today and tomorrow.

KEY HIGHLIGHTS

Diversity of Participants



Diversity of Participants



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DETAILED REPORT

Math.Biz 2024

OBJECTIVE

The primary objective of Math.Biz 2024 was to expose students to the application based aspect of Mathematics in areas like Finance, Economics and Accounting. Students often learn Mathematics without knowing where they might find its application, but once they perceive the application of Mathematics in a particular field, it becomes all the more meaningful for them to learn Mathematics. Till date, there has been no programme other than Math. Biz that focuses on looking at Economics and Finance through the lens of Mathematics for school students. The goal of Math.Biz 2024 was to get students to appreciate the beauty of the intersection of Mathematics with other disciplines.





SELECTION PROCEDURE

Aspiring students from sixteen Indian states and one foreign nation sent applications to participate in Math. Biz 2024. Out of hundreds of applications that were received, eighty six applications were selected after a rigorous and challenging two hour selection test.

PRE-CAMP

Before the residential camp, students actively prepared themselves by engaging with meticulously crafted preparatory notes provided by the academic team of the camp and taking the quiz based on the material shared. This was crafted to occupy students for approximately one month of the pre camp period. This proactive approach of making pre-reading materials and assignments available to participants ahead of the camp ensured that they arrived well-equipped and ready to make the most out of the learning experience.

PEDAGOGY AND PROGRAM SCHEDULE

The selected participants were divided into two batches based on their grades and scores. The two batches were called 'Small Caps' and 'Mid Caps'. A regular day at Math. Biz 2024 consisted of 3-4 sessions by the in-house faculty, along with 1-2 sessions by guest speakers. The sessions helped converge the speakers' expertise in different areas of mathematics. Each session was followed by a doubt clearing session which was handled by the teaching assistants. The participants were also involved in body movement and social emotional sessions that imparted valuable practical insight on social bonding and self expression. Throughout the duration of the camp, the participants were encouraged to ask questions and analyze the reasons behind every statement and proof. The participants derived different formulae and were excited to discover something new based on their derivations. All the sessions were highly interactive. While some of the questions posed by the participants evoked amusement in the speakers, others left the speakers speechless on the level of knowledge and curiosity of the students. The questions asked clearly indicated the keen, curious and intelligent nature of the participants.



FIELD TRIP



Campers were warmly welcomed by **Franklin Templeton's** experienced team. The senior management presented on the company's operations, their diverse fund offerings, portfolio creation, risk management strategies, and the cutting-edge technology and data science they employ to benefit their investors.

Over a three-hour interactive session, students engaged with the team, asking insightful questions that went beyond their academic curriculum. The visit aimed to bridge the gap between theoretical knowledge and real-world application, showing students how the concepts, they learned at **Math.Biz** are implemented by industry professionals. The topics discussed include bond duration and convexity, data science topics such as regression, clustering, neural networks, and how algo modeling works in the investment world, and various factors that go into creating an ideal quant/algo model.



TOPICS COVERED IN THE CAMP

Small Caps

1. Introduction to Game Theory
2. Congruence between Life Goals and Assets
3. Market Structures
4. Introduction to Financial Mathematics
5. Relationship between AR, MR, and Elasticity
6. Mathematical Induction
7. Probability Distributions
8. Central Limit Theorem
9. Introduction to Portfolio Theory
10. Introduction to Regression and Data Analytics
11. Overview of Equities

Mid Caps

1. Introduction to Financial Mathematics
2. Market Structures
3. Congruence between Life Goals and Assets
4. Bond Mathematics
5. Mathematical Modeling of Risk
6. Mathematical Induction
7. Probability Distributions
8. Introduction to Regression and Data Analytics
9. Portfolio Theory with Matrix Algebra
10. Central Limit Theorem
11. Financial Derivatives
12. Portfolio Theory with Matrix Algebra

Combined Sessions

1. Life > Mathematical Probability
2. Auctions
3. Cost Functions & Introduction to Calculus
4. Elasticity of Demand
5. Data Visualization using R
6. Central Tendency and Dispersion
7. Introduction to Algorithmic Thinking
8. Artificial Intelligence
9. Introduction to Macroeconomics
10. Introduction to Behavioral Economics
11. Covariance and Correlation
12. Introduction to Financial Products
13. Logic and Mathematics
14. Simpson's Paradox

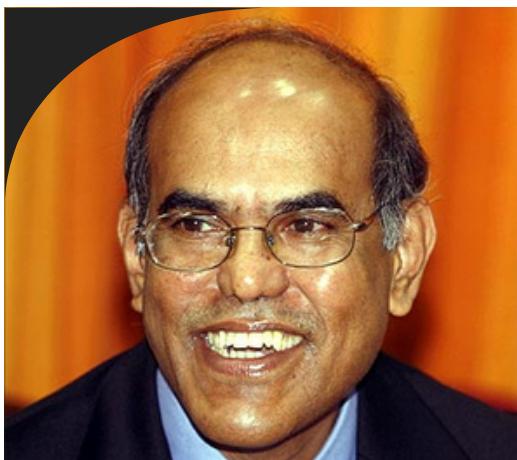


CHIEF GUESTS



Ms. Premlata Poonia

Ms. Premlata Poonia, Founder of Hamari Laado, a charitable initiative dedicated to creating brighter futures for girls in rural India, delivered a keynote address at our inaugural event. Her speech, titled "Life > Mathematical Probability," shared her remarkable journey from a small village in Rajasthan on the India-Pakistan border to IMT Ghaziabad, the University of Michigan, and ultimately leading a billion-dollar business in the U.S.A. She eventually left her corporate success to return to her roots and empower young girls in similar situations. Her story was a powerful inspiration to all attendees. Premlata stayed at the camp for several days, engaging with our students and providing them with the motivation and insights needed to succeed and contribute to the greater good.



Dr. Duvvuri Subbarao

Dr. Duvvuri Subbarao, former Governor of the Reserve Bank of India (2008-2013) and Finance Secretary (2007-2008), graced our valedictory as the Chief Guest. He shared insights from his distinguished career in the Indian Administrative Service and discussed the vital role of the RBI in the nation's economy. Dr. Subbarao also engaged with students, faculty, and volunteers, signing copies of his autobiography and offering personal interactions, leaving a lasting impact on all attendees.

SPEAKERS LINE UP



Dr. Hari Ramasubramanian

Asst. Prof. at Frankfurt School of Finance and - Management, and co-founder of RAM Foundation.

- He took sessions on Cost Functions, Introduction to Calculus, Elasticity of Demand, Introduction to Game Theory and Data Analytics.



CA Jayaprakash Rajangam

Chartered Accountant, M&A Consultant, and chairman of RAM Foundation.

- He took sessions on the Congruence between Life Goals and Assets.



Ms. Aditi Krishnakumar

Author, Mathematician, Financial professional, and IIM alumni. - She took sessions on Portfolio Theory and Matrix Algebra.



CA Harish Menon

Chartered Accountant, Co-founder - House of Alpha. - He took sessions on Financial Derivatives and an Overview of Equities.

SPEAKERS LINE UP



Dr. Keerti Pendyal

Assistant Professor at Mahindra University School of Management, and IIM alumni. - He took sessions on Probability Distributions and market structures.



Dr. Anjali Rajan

Assistant Professor at Mahindra University School of Management, and IIM alumni. - She took sessions on Introduction to Macroeconomics and Data Visualization using R.



Mr. Vinay Nair

Co-founder of RAM foundation, founder of Vichar Vatika, and director of Epsilon India. - He took sessions on Mathematical Induction.



Mr. Mokshit Kothari

RAM Alumni, CA aspirant and Actuarial aspirant. - He took sessions introducing students to Financial Mathematics

SPEAKERS LINE UP



Mr. Sundarraman Madhusudan

RAM Alumni, CMI and NIT Trichy alumni. - He took a session on Probability Distributions.



Mr. Nellai Sharuk

RAM Alumni, BSc Statistics. - He took sessions on the Central Limit Theorem.



Dr. Ankit Dwivedi

Phd in storytelling from Tata Institute of Social Sciences. - He took sessions which helped the students to break away from their routine study schedules and explore new avenues of creativity and expression. This inculcated socio-emotional learning among the students.

GUEST SPEAKERS



Dr. Jeff Wooldridge

Walter Adams Distinguished Faculty Fellow in Economics and University Distinguished Professor at Michigan State University. - He introduced students to the Simpson's Paradox in the field of statistics and econometrics.



Mr. Chakit Chawda

Commodity Trader, IIT alumni. - He spoke about his journey starting from small-town India to studying industrial and financial engineering at IIT Kharagpur and working in the finance industry as a trader at a major global financial institution.



Dr. S Sivaram

Consultant and Principal Compliance – BHP Marketing Services, Doctorate in Cultural Studies. - He took a session on how logic and mathematics can be used to reach the United Nations' sustainable development goals.



Mr. Aadityan Ganesh

RAM and CMI Alumni, pursuing PhD in Computer Science at Princeton University. - He conducted an interactive session on auctions.



Dr. Shailesh Kumar

Chief Data Scientist at the Center of Excellence in AI/ML, Reliance Jio. - He demystified how Machine Learning and Artificial Intelligence are used in daily life.



CONCLUSION

The syllabus taught to the participants was vast - from blockchain to actuarial science. The level of the topics were that of graduate and CA entry level courses. The participants were provided with quite a lot of food for thought for the coming days and will apply the real world tools they learnt, in their future endeavors.

Math.Biz aims to bring the use of core mathematics in finance, business and economics to light and provide participants with an arena of careers and opportunities that await their curious minds.



SUPPORTERS



The core course structure of Math.Biz was designed and delivered by Raising A Mathematician Foundation.



Mahindra University sponsored the venues, accommodation, food, and all associated logistical support.



The program was sponsored by Pravaha Foundation, which also covered socio-emotional learning and body movement workshops for the students.

CONTACT US



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