RAM TP 2022

REPORT

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May 22nd to 28th, 2022
Online

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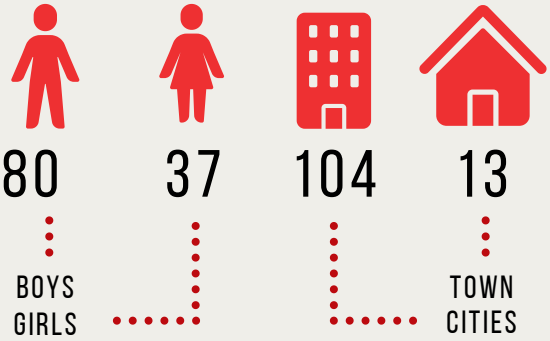
KEY HIGHLIGHTS

Key highlights of
Raising A Mathematician Training Program – 2022
(Event supported by CMI)

STUDENT DIVERSITY



KEYNOTE SPEAKERS

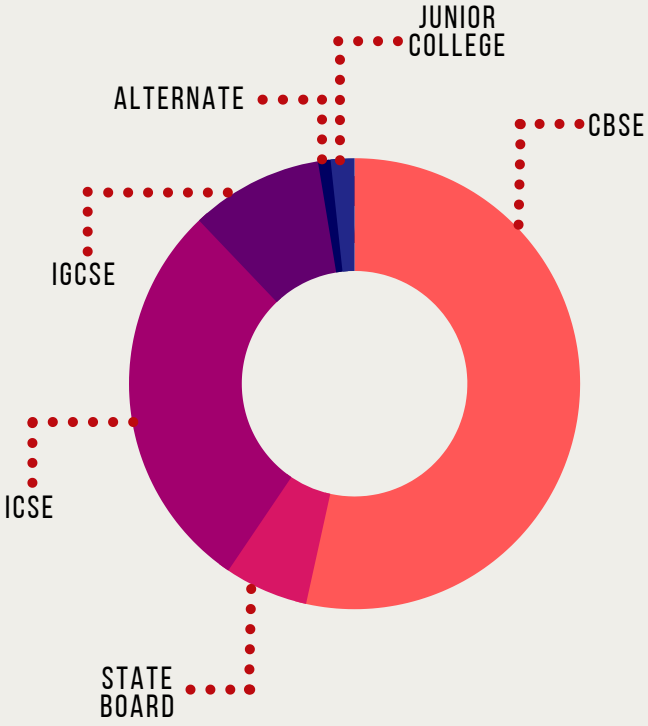
Dr. S. P. Kothari

Gordon Y. Billard Professor of Accounting and Finance at the MIT Sloan School of Management and a Padma Shri awardee

Dr. Subhash Kak

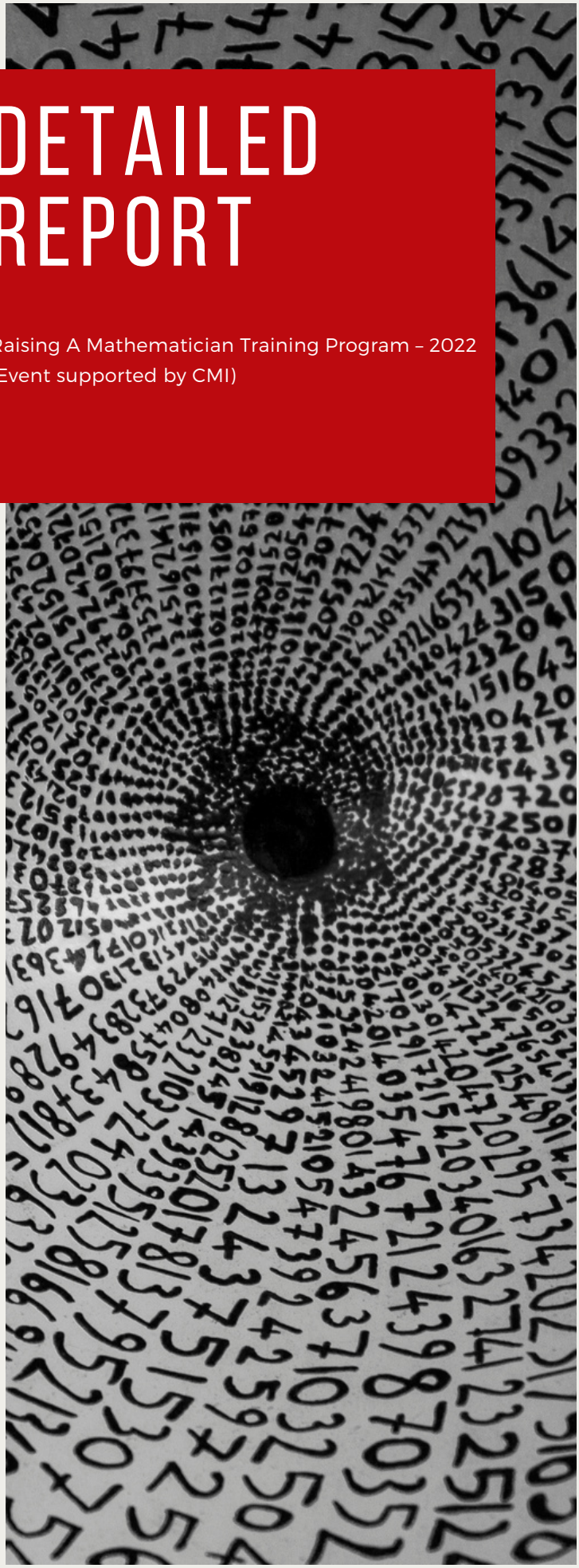
Indian-American computer scientist and historical revisionist and a Padma Shri awardee

GRACED THE OCCASION WITH THEIR PRESENCE



FACULTY

Eminent technical speakers from 3 countries contributed and shared experiences.



DETAILED REPORT

Raising A Mathematician Training Program – 2022
(Event supported by CMI)

OBJECTIVE
OF RAM TP

To search and mentor young mathematical talent (age group 13-15 years) in the country and guide them to hone their skills and thinking by giving them the right tools and create a research mentality in mathematics.

SELECTION
PROCEDURE

Out of hundreds of applications that were received from nineteen states across India, 117 applications were selected. The selection procedure was based on thorough evaluation of the Students' Application Form and the Teacher's Recommendation letter through which the participant's inclination towards mathematics were assessed.

PEDAGOGY AND PROGRAM SCHEDULE

After successfully conducting RAM TP 2020 and 2021 in online mode, RAM TP 2022 was also conducted in an online mode due to the unfortunate event of Covid 19 pandemic. The students were divided into 4 batches - A, B, C & D, with Batch C and D comprising the most advanced students.

TOPICS COVERED

For
Batch A, B, C & D

For Batch A & B

These two batches of new students were exposed to a wide range of topics like Quadratic Indeterminate equations, some functions in Number theory, introduction to mathematical modelling, proof of mathematical induction, cryptography, linear programming, a peek into Theoretical Computer Science, proof of contrapositive, Farey sequence, math, poetry and algorithms, math, music and algorithms and explorations in geometry.

For Batch C

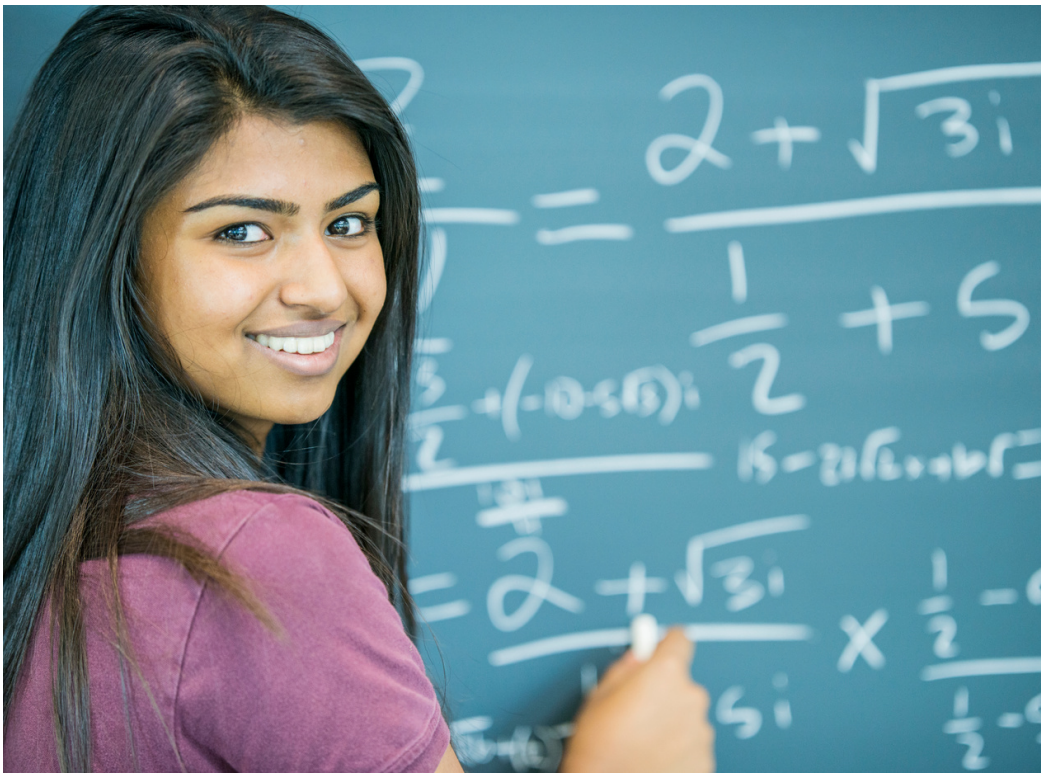
Batch C had a few lectures on advanced group theory. The class started with introducing the meaning of 'Groups' and providing an overview of the notations that would be used often. The characteristics were presented simultaneously with the Abelian group. Students were exposed to many instances in order to have a better comprehension of the issue. Cosets were taught after the Abelian group. The lecture was completed with examples and numerous thought-provoking questions.

For Batch D

Batch D also covered the topics like review of python, Introduction to causal inference and AI, Deep Learning in addition to their combined learning with Batch C. The students were introduced to Neural Networks and Deep Learning, which are constantly finding their place in the real world. The batch started by revisiting Python, covering the basic format, variable initialisation, functions and classes. We later learnt about Neural Networks. Some topics covered were Features and Inputs, neural network models and cost functions and were closely connected with a course done in last year's RAM TP, particularly Regression. In the final session, we ran examples on Google Colab. One of these was about the correlation of various living factors with crime, education, etc.

For Batch C and D

Batches C and D had more intricate and challenging topics like Matrix Algorithms and Linear Algebra. The sessions on Matrix Algorithms started off with an introduction to Data Science and the use of matrices in image compression. The students were also introduced to the concept of neural networks and deep learning. Over the seven days in the camp, students were exposed to basic matrix algorithms, polynomial time determinants, image compressing and much more! The students were provided some pre-reading material on linear algebra. During the sessions, the students explored more about the topic. As opposed to the pre-requisites, which focused on real vector spaces, the lecture focused on abstracting out the structural properties from these vector spaces sufficient to do cool algebra. During the sessions, the participants setup basic definitions and notations that will guide them in their journey in the world of abstract algebra!



SPEAKERS

LINEUP

We were honored by the presence of Padma Shri awardee **Dr. S.P Kothari**, the Gordon Y. Billard Professor of Accounting and Finance at the MIT Sloan School of Management for the inaugural of RAM TP 2022. Dr. Kothari said that nothing stands out like excellence, and then emphasized on the significance of hard work in its attainment. His talk was both insightful and inspiring!

The chief guest for valedictory was Padma Shri awardee **Dr. Subhash Kak**, an Indian-American computer scientist and historical revisionist. He inspired and excited the students with the endless possibilities that the future holds.

There were sessions by in-house speakers and guest speakers every day.

GUEST SPEAKERS

Prof. Brian Mittendorf

The Ohio State University

He serves as Senior Associate Dean for Staff, Human Resources and Culture. He introduced the students to the field of accounting and gave them an insight about the exciting side of the same.

Prof. Jeffrey M. Wooldridge

Michigan State University, USA

He is known for his theoretical contributions to analysis of cross-sectional and panel data took a session on Simpson's paradox and causal inference. He introduced the students to the subject of economics.

Prof. Vishal Dixit

IIT Bombay

A climate modeler interested in tropical climate dynamics introduced the domain of Environmental Mathematical Studies to the enthusiastic participants.

Prof. Krishna S.

IIT Bombay

A faculty member at the department of computer science and engineering introduced some topics of theoretical computer science through interesting puzzles.

Mr. Raghavendra N. Bhat

University of Illinois, Urbana Champaign

With a major in Mathematics and minor in Computer Science talked about group-like structure for primes.

Creya Learning

Creya Learning & Research specialists in STEM learning and Design Studio Program introduced the participants to AI.

IN-HOUSE FACULTY

Dr. Hariharan Ramasubramanian

Head of Academic Affairs, RAM Foundation

Faculty at Frankfurt School of Finance and Management) took the students into the world of Quadratic indeterminate equations, mathematical modelling and causal inference and AI.

Mr. Yogesh Waikul

A Mechanical Engineer with master's degree in Financial Management

He taught linear programming.

Dr. S. Muralidharan

Retired Computer Scientist

He taught Farey Sequences.

Mr. Aadityan Ganesh

Alumni of RAM TP

Taught advanced topics like Linear Algebra.

Prof. Nithin Varma

Chennai Mathematical Institute

He introduced Matrix Algorithms along with Kavita Sutar.

Mr. Vinay Nair

Co-founder of RAM Foundation

He did beautiful sessions on Math, Poetry & Algorithms and Math, Music & Algorithms. He also introduced Proof by Contradiction and Proof by Contrapositive.

Mr. Shriprasad Tambe

MSc in Mathematics from IIT Bombay

He did Cryptography and Group Theory with the math enthusiasts.

Mr. Bhas Bhamre

Founder of Bhas Bhamre Academy

He explored Geometry with the passionate learners.

Prof. Kavita Sutar

Chennai Mathematical Institute

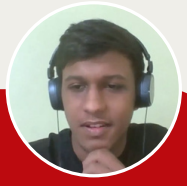
She introduced Matrix Algorithms along with Nithin Varma.

ALUMNI

OF RAM TP

Ms. Saee Patil

explorer of Number Theory and Theoretical Computer Science and a recipient of The Spirit of Ramanujan Fellowship conducted pre-camp sessions.



Mr. Sarth Chavan

an aspiring number theorist and a recipient of The Spirit of Ramanujan Fellowship talked about research and inspired students to take up research.

Mr. Sharuk A. S.

who is currently pursuing undergraduate degree with a Major in Statistics and Minor in Mathematics conducted a session on Statistical Reasoning.

Mr. Rishit Dagli

RAM alumni did AI, Deep Learning with the curious students.

Equipping students with these essential skills, helps open the gateway into the world of advanced science and technology and gives the students a great head start. In alignment with its purpose of spreading education beyond the confines of school syllabi, RAM Foundation believes that these topics will enhance students' skill set and accelerate their learning curve. Identifying mathematically exceptional students from around the country, RAM TP gives the senior batch an opportunity to put their minds to use and explore advanced fields.

SUPPORTERS OF RAM TP 2022

RAM TP 2022 was supported through the generous donation of time and money by both organizations and individual contributors. Special thanks to:

Chennai Mathematical Institute (CMI)

For being our knowledge partner. Professors from Chennai Mathematical Institute, a centre of excellence for teaching and research, contributed immensely to RAM TP by serving as Faculty as well as by giving guest lectures. The students from CMI engaged with the RAM TP participants by volunteering as Teaching Assistants and also by participating in round table discussions. Through their work with RAM TP, CMI has inspired the next generation of students to engage more deeply in Mathematics.

Mr. Anirban Mukherjee (CEO, PAYU) and Mrs. Smita Mukherjee

For their generous donation towards RAM TP.

Parents of participants from RAM TP 2022. RAM TP was immensely supported by an enthusiastic band of volunteers 18 who were pivotal in ensuring the smooth operations of the camp.

GET IN TOUCH WITH US

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